

**‘Voices of the Fishantry’:  
Learning on the Livelihood Dynamics from Bangladesh**

by

**Apurba Krishna Deb**

A Thesis submitted to the Faculty of Graduate Studies of

The University of Manitoba

in partial fulfilment of the requirements of the degree of

**Doctor of Philosophy**

Department of Natural Resources and Environmental Management

Natural Resources Institute

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Winnipeg, Manitoba, Canada

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*Dedication*

*Dedicated to the sweet memories of my beloved father*  
*Brajendra Lal Deb*  
*'A man of soil, gone too soon, back to the soil'*

## Abstract

This research critically examines the livelihood dynamics of the artisanal fishers of Bangladesh. The motivation for and objectives of this empirical research arises from the perceived need to gain better understanding about the artisanal fishers' capabilities, complex web of institutions and negotiations, multiple cross-scale stressors, and the ways of living. Situated within the broad thematic areas of sustainable livelihoods, this research has drawn upon from various mutually inclusive disciplinary knowledge and tools ranging from cultural anthropology, ethno-ecology-biology, rural livelihoods, sustainability science, marine and inland fisheries, fisheries ecology and aquaculture. Both qualitative and quantitative tools were used with heavy dependence on the participatory techniques (*emic* perspectives) including focus group discussions, key informant interviews, participant observations, and longitudinal case studies at household levels. Following a comparative case study approach, the field research was conducted for 21 months starting from January 2005 in the floodplain 'Volarkandi' village (representing Muslim fishers) and the coastal 'Thakurtala' fishing village of Moheskhali island (representing caste-based Hindu fishers).

For examining fishers' conditions, production relations and livelihoods, this study introduces an innovative conceptual lens 'Fishantry' for artisanal fishers (as is peasantry for peasants). Despite some commonalities between peasants' and fishers' modes of production, the fundamental line of difference lies in the fact that most of the activities of peasants are land-oriented, while those of fishers are centered around different water bodies ranging from wetlands to littoral zone to deep sea. This peculiar ecosystem orientation generates divergent and complex ways of fishers' lives, knowledge base, world views and production relations. This research has examined the vast and esoteric traditional ecological knowledge of the fishers. Most of the fishers hold limited sets of endowments; as a result, their capabilities to ensure livelihood well-being from the aquatic resource base remain limited.

Appropriate to fishantry, cultural and political capitals are also considered pertinent beyond the conventional asset pentagons of contemporary livelihood frameworks. Fishers' livelihoods widely centre on subsistence ethic mode of income and employment. The corollary is that, fishers who fall below the economic equilibrium with extremely low income level do critically risk not only nutritional deprivation, but also their familial and social standing in the community. Poverty and vulnerabilities in the fishing villages have cross-scale connections to multiple roots (the very ecotype and resource base, ownership of endowments, institutional, political, geographical, religious and cultural ethnicity) that affect fishers singly or synergistically. Within the frames of unique socio-cultural patterns of the fishing villages, fishing women perform both reproductive and productive roles, some of which fall under the socially viewed 'masculine character'. They enjoy relatively greater freedom compared to the women in rural peasantry.

The societal and economic systems of artisanal fishery are as complex and adaptive as the food webs of the biological systems therein. There exists structured social inequality, demographic and ethnic transformation, and power gaps within the fishantry. The fisher-middleperson relationship is an inevitable outcome of the peculiarity and uncertainty of the fishing occupation itself backed by customary political economy, socio-cultural structures and traditions, and perishability of the produce. The institutional supports required in a dynamic marketing are beyond the reach of poor fishers.

Small-scale fishers are trapped in a vicious cycle of absolute poverty in all considerations and bear the consequences of livelihood ill-beings. They evolved sets of coping strategies to shield themselves from a host of adversities. Fishing entitlement is an important determinant of fishers' livelihoods and overall well-being or ill-being, especially in the floodplain wetlands. This is how, the transfer of ownership of common-use wetlands to leaseholders and the increasing trend of mechanization in the coast make us think that there are politically determined institutional processes at cross-scale boundaries and times that consequently reproduce complex economic processes causing 'disentitlement' and sustaining poverty.

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## Acronyms and glossary

- Aadda*: Informal discussions usually carried out in the yard or village tea stall  
*Amabashya*: New moon phase  
*Bam/Baam*: Local measurement of depth, equivalent to around one meter  
*Baor*: Oxbow lake  
*Beels*: Small depressed land that becomes inundated during monsoons  
*Bhata*: Low tide  
CBFM: Community Based Fisheries Management Project  
CBO: Community Based Organization  
CCRF: Code of Conduct for Responsible Fisheries, framework developed by FAO  
CNRS: Centre for Natural Resource Studies, a non-government organisation  
CPUE: Catch Per Unit Effort  
CWBMP: Coastal and Wetland Biodiversity Management Project  
*Dadon*: Informal rural money lending institution  
DoF: Department of Fisheries of the Government of Bangladesh  
ECFC: Empowerment of Coastal Fishing Communities for Livelihood Security  
ESBN: Esuarine Set Bag Net, also localised called *Behundi* net  
*Faar*: Locally crafted territorial management of coastal fisheries  
FAO: Food and Agricultural Organization of the United Nations  
FGD: Focus Group Discussion  
*Ganga*: The Goddess of the sea widely respected by coastal Hindu fishers  
*Haor*: Flooded shallow depressed area in the floodplain that look like a single waterbody  
HH: Household, often synonymously used for family  
*Hilsa*: Indian river shad, the national fish of Bangladesh  
Imam/Moulana: The priest of the mosque  
*Jaladas*: Literally ‘slaves of water’, a Hindu caste-based fishing community  
*Jalmohal*: Waterbody  
*Jatka*: Immature juveniles of Hilsa fish, size varies from 2-5 inches  
*Joar*: High tide  
*Kamla/Gaor*: Laborers working on the fishing boats on temporary basis  
*Kantha*: Fish aggregation device, usually using branches of trees  
*Laxmi*: Goddess of wealth as per Hindu faith  
*Maimal*: A Muslim fishing group, usually considered low-class in social hierarchy  
*Majhi*: Helmsman  
MSBN: Marine Set Bag Net, larger version of *Behundi* net  
PRA: Participatory Rural Appraisal  
*Purnima*: Full moon phase  
RRA: Rapid Rural Appraisal  
*Sarder*: The head of the informal village institution in the Hindu fishing village  
*Shomaj*: The wider society within and outside village  
*Sunderban*: Literally ‘beautiful forest’, a dense mangrove forest in the south-west  
SWOT: Strength, Weakness, Opportunities and Threats  
Taka: Local currency of Bangladesh (1US\$= Taka 65)  
UNDP: United Nations Development Programme  
VGF: Vulnerable Group Feeding, a programme launched by the government to feed poor

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## Chapter One: Introduction

*'Have you ever experienced war'?* asked Brojomohon Jaladas (a caste-based Hindu fisher) while I was interviewing him.

*'Yes, for a few months in my early childhood during the liberation war in 1971 against the Pakistani military regime. We stayed in India as refugee for 10 months,'* I replied.

*'That was a war for a short span of time. Military wars come to an end in a few months or years. The war of the poor for mere survival is the longest one; it starts from the very day of the 'embryo formation' in the mother's womb and ends with the flame of fire in the graveyard. The 'fetus' knows the condition of mother's health and ability. In this day-to-day life of practical war, the only anxiety is how to arrange the next meals for family members. Problem is that the adults get used to fasting, but the children are uncompromising for food; they keep crying the whole day and at one stage get tired and sleep. What a struggle for food for survival; not just a few days or seasons, day after day! There is no other thinking or challenges except the issue of mere survival. To be born as a fisher is a curse from God; it is something like paying for past sins ...'* he continued.

The 'livelihood war' of the poor is seemingly a never-ending one. A renewed interest in sustainable livelihood enhancement of fishers<sup>1</sup> is critically needed in developing countries like Bangladesh in order to alleviate their poverty and halt further degradation of the fisheries resources and aquatic ecosystems to the detriment of the disadvantaged fishing communities and the economies associated with the small-scale fisheries. Using an *emic* view, this dissertation examines the aspects of the livelihood war of small-scale fishers of Bangladesh. It inquires into their capitals and differential entitlements, the shocks and stresses they face in their lives, their efforts in diversifying livelihood strategies, and the ways they handle livelihood insecurities. In this introductory chapter, I intend to illustrate the contexts of the research; then I pose the main research questions and objectives that stimulated my research. After that, I provide a description of the structure of the dissertation.

### 1.1. Bangladesh: The macro context

The economy of Bangladesh (Table 1.1, see Figure 2.1 in Chapter 2) is based on a limited natural resource base; the country has been exploited historically by the British colonial and Pakistani regimes. Its major impediments to growth include frequent cyclones and floods, inefficient state institutions, a rapidly growing unskilled population, and slow

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<sup>1</sup>Throughout the thesis, the word 'fisher(s)' is used as a gender neutral expression to mean fishing communities collectively. The word 'fisherman' is intended to focus on the 'active male fisher'. Accordingly, the word 'fisherwomen' is intended to focus on the 'active women fishers' who earn from the fisheries sector. However, in case of quotes or referred sources, the words 'fishermen' and 'fisherwomen' are used.

implementation of economic reforms. The political culture is widely characterized by intolerance and a lack of well-functioning democratic practices. Despite the constitutional guarantee<sup>2</sup> of a decent living and equality, the majority of the poor live in abject poverty. The income disparity between the poor and the richest 5% has increased from 18 times in 1990 to 84 times in 2004; such gaps keep widening as growth benefits have been unequally distributed (BIDS and CPRC 2006). An assessment of the Millennium Development Goals of the country reveals that the current trend of development indicates progress in the areas of chronic hunger reduction, net enrolment in primary education, gender parity in primary and secondary education, reducing child mortality and improving immunization coverage, rolling back malaria and controlling tuberculosis, and improved drinking water supply. However, it is observed that the progress in the areas of poverty reduction and employment, increase in the primary school completion rate and adult literacy rate, and creation of more wage employment for women, fell below the expected targets (UNDP 2009).

**Table 1.1: Basic statistics on Bangladesh**

Issue	Facts/ figures
Location	Between 20°34' and 26°38' North Latitude and 88°01' and 92°41' East Longitude with a total landmass of 147,570 square kilometers (56,977 square miles).
Development Index <sup>1</sup>	Human Development Index rank: 146 out of 182 countries Gender Development Index rank: 101 Human Poverty Index rank: 112
GNI per capita- Atlas method <sup>2</sup>	US\$ 490
Poverty level <sup>3</sup>	50% below poverty line with <US\$1/day; 82.8% below US\$2/day; 20% hardcore poor with <1800 Kcal/day
Population growth and development <sup>4</sup>	Population: 142.46 million (2008 estimate) (world's 8 <sup>th</sup> largest populous country; size of New York State with half of US population crammed into it) Annual population growth rate: 1.3% (2006-2008) Adult literacy rate: 53.5 (2007 estimate) Under-5 mortality rate/1000 live births: 61 (2007 estimate) Population using safe drinking water: 80% (2006 estimate)
GDP and external debts <sup>2</sup>	US\$ 61.9 billion and 18,935 million
Landlessness <sup>2</sup>	46.3% people
Sex ratio	1.06 male: 1female

Source: <sup>1</sup>UNDP 2009, <sup>2</sup>World Bank Fact Sheet 2007, <sup>3</sup>World Food Program 2007, <sup>4</sup>ADB 2009

<sup>2</sup> Sections 19(1) and (2) of the Bangladesh constitution states: 1. The State shall endeavor to ensure equality of opportunity to all citizens; 2. The State shall adopt effective measures to remove social and economic inequality between man and man and to ensure equitable distribution of wealth among citizens, and on opportunities in order to attain a uniform level of economic development throughout the Republic.

Bangladesh is located on the largest deltaic region of the world and significantly impacted by the mighty rivers- the Ganges, Brahmaputra and Meghna (GBM) that merge in her plain before entering the Bay of Bengal of the Indian Ocean. Like those of the Niger, Nile and Zambezi floodplains in Africa and the upper Rhine floodplains in Europe, the GBM floodplains have always been the centre of human habitation ( $>2000/\text{km}^2$  in Bangladesh floodplains) (Payne 1997), civilization, livelihoods and a vibrant culture in South Asia. Extended over 4.3 million hectares of numerous waterbodies of different depths and shapes (such as rivers, estuaries, oxbow lakes/*baors*, low-lying natural depressions or *haors*, and shallow rice fields), the wide floodplains<sup>3</sup> greatly support inland aquatic resource systems including fisheries. The reproductive physiology, breeding behavior, and performance of all inland water fish and prawns (some 257 species of fin-fish and 20 species of prawns) are tuned to the rhythms of early flooding and hydraulics of the floodwaters (Ali 1990). The country's geography is fish-friendly. Historically, its role is evident in numerous socio-religious ceremonies, mythology and characteristic cultural symbolism.

Her rich aquatic ecosystems and resources therein have enabled the rural 'working class' to be engaged in fishing for sustenance and livelihoods for the whole or part of the year since time immemorial. Graced by numerous floodplain and coastal waterbodies, fishery in Bangladesh plays a very significant role in terms of nutrition, employment, foreign exchange earning and food supply. Historically, rural fishers have been successful in securing their livelihoods in a sustainable manner through managing local resources, and the people have inherited knowledge and indigenous adaptations for making their livelihoods in the floodplains of Bangladesh (Haque 1997). Fisheries make a 5.24% contribution to the GDP (Gross Domestic Product) and its value in the GNP (Gross National Product) is around Taka 137,486 million (1US\$=Taka 65). The fisheries sub-sector provides full-time employment to over 1.2 million people and part-time employment to another 11 million people<sup>4</sup> who earn their livelihoods indirectly from

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<sup>3</sup> On an average, around 26,000 km<sup>2</sup> of the floodplain is submerged during monsoonal seasons that may occasionally rise to 95,000 km<sup>2</sup> (66% of the country) with variations in area of inundation, depth and duration. Around 80% of the country falls under floodplain agro-ecological zones.

<sup>4</sup> To thousands of people whose livelihoods have been threatened or displaced from a regular source of income, inland and artisanal fishery appears as the occupation of the last resort. If the present rate of

fishery-related activities (DoF 2003). Inland capture fisheries, inland culture fisheries, and the marine fisheries comprise a water area of 4,047,316 ha, 528,390 ha and 41,040 square nautical miles respectively. Total fish production of the country is around 2563,296 MT of which inland culture fisheries, inland capture fisheries and marine capture fisheries contribute about 39.23%, 41.36% and 19.41% respectively. Coastal artisanal fisheries contribute 497,573 MT (93% of total marine production) and the industrial sector contributes 34,159 MT respectively. Although the growth in the culture fisheries sector is appreciably positive, production in the inland and marine capture fisheries keeps dwindling (DoF 2009).

## 1.2. Small-scale fishery and fishers' livelihoods

Small-scale fishing<sup>5</sup> (used as synonym for artisanal fishery in this dissertation) is not only a source of livelihood for the rural fishers, but also an 'art of living' that is characterized by a long tradition of adaptation to the dynamics of the social and natural environment. The fisheries are widely recognized for their divergence of locally crafted technologies, prevalence of rich indigenous fisheries knowledge and unique social formation (Berkes et al. 2001, Johnson 2006). Especially in developing countries like Bangladesh, the importance of small-scale fisheries is immense in the context of livelihood and food security for a vast population. Compared to the industrial fishery, small-scale fishing is widely considered to be ecologically resilient and equitable in sharing socio-economic benefits derived from the aquatic resources; the fishery also deserves special attention for

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population growth and industrial development continues, it is estimated the inclusion of the number of 'future fishers' might at least double by 2020.

<sup>5</sup> The FAO Working Group on Small-Scale Fisheries (Bangkok, November 2003) agreed it would be inappropriate to formulate a universally applicable definition for a sector as dynamic and diverse as small-scale fisheries. Yet the fishery has something generic about it. The Working Group endorsed that '*small-scale fisheries can be broadly characterized as a dynamic and evolving sector employing labor intensive harvesting, processing and distribution technologies to exploit marine and inland water fishery resources. The activities of this sub-sector, conducted fulltime or part-time or just seasonally, are often targeted on supplying fish and fishery products to local and domestic markets, and for subsistence consumption. ... While typically men are engaged in fishing and women in fish processing and marketing, women are also known to engage in near shore harvesting activities ...small-scale fisheries operate at widely differing organizational levels ranging from self-employed single operators through informal microenterprises to formal sector businesses. This sub-sector, therefore, is not homogenous within and across countries and regions and attention to this fact is warranted when formulating strategies and policies for enhancing its contribution to food security and poverty alleviation*' (FAO 2005: 4). In the fisheries and anthropological literature, small-scale fishing is also known as artisanal, inshore, traditional, municipal, pre-industrial and subsistence fishing.

nurturing a rich cultural heritage and indigenous knowledge of the fishers (Berkes et al. 2001, FAO 2005). Small-scale fishery is viewed as a complex system (Jentoft and Chuenpagdee 2009), and it can be argued that livelihoods dependent on such a system are simultaneously destined to be complex and diverse. For most of the artisanal fishers, such a complex livelihood struggle indicates the failure to meet basic human needs and the denial of opportunity to live long, healthy and creative lives.

The small-scale fisheries in Bangladesh are mostly open access and unregulated. For obvious reasons, where labor mobility in a densely-populated society is not impeded by legal, social, political and other factors, low-skilled poor people are expected to enter open access fisheries as long as incomes from similar economies are lower than those in the fisheries. Most of the fishers are buffeted by numerous stresses emanating from cross-scale sources, and consequently caught in a vicious cycle of poverty. They suffer not only from income deficiency, but also from a host of other dimensions of poverty (lack of education, poor access to health care facilities, poor sanitary condition, etc.). The persistence of poverty<sup>6</sup> among fishers is attributed not only to the overall health of the fisheries resource, the pattern of exploitation and the level of catch per unit effort (CPUE), but also how the benefits derived from the exploitation of the fisheries resources are distributed among primary resource users to ensure their fundamental needs (FAO 2005). Attempts to ensure sustainable use of the fisheries resources and the livelihood well-being of the communities primarily dependent on fisheries are intertwined. A sense of desperation for ensuring basic needs is usually apparent among the artisanal fishers; it is agreed that 'exhortations about reducing pressure on fishery resources are futile as hungry people will choose, quite reasonably, to survive in the short term rather than preserve or rebuild a resource they might not benefit from in the long term' (*Ibid*: xiv).

In the contemporary literature on rural development and poor people's livelihoods, we see a plethora of concepts ranging from basic food security to more encompassing concepts like entitlements, vulnerabilities, community empowerment and sustainable livelihood. Indeed, the concept of livelihood goes beyond the economists'

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<sup>6</sup> See Bene 2003 and Thorpe et al. 2007 for differing views on poverty in small-scale fisheries. Going beyond the fallacies 'poor because fishers' and 'fishers because poor', it is argued that poverty in small-scale fisheries is manifested in complex ways which are often determined by socio-institutional forms.

objective view of income poverty, and focuses more on qualitative and subjective social issues through the lens of the people (Chambers 1989, 1994a, 1994b; Chambers and Conway 1992, Scoones 1998, Sen 1999, Bebbington 1999). These people-centred approaches call for 'thoughtful investigations into the workings of human societies, and human societies are complex- so complex and diverse that they easily break out of any attempt to confine them within neatly drawn frameworks, categories and definitions' (Twigg and Bhatt 1998:7). Livelihood analyses capture the dynamics of interactions and links between various positive and negative forces such as multiple vulnerabilities, livelihood capitals, overarching policies, formal and informal institutions, coping actions, and others which singly or synergistically impact the daily lives and well-being of communities. Contemporary research works on livelihoods focus on the fact that poor people adapt strategies to make their livelihood functions smooth in the context of their own localities (Bryceson 2000, Carney 1998, DFID 1999, Ellis 2000, Shankland 2000, *cited in* Toner 2003).

There are multi-stranded *emic* views of poverty. Typical markers for artisanal fishers vary widely from those of rural peasantry (see Table 3.1 in Chapter 3 for details). There are commonly agreed attributes for measuring poverty or well-being in peasantries (like area of farming land). However, given the divergence of small-scale fishery, developing a common set of attributes that would be applicable in measuring livelihood well-being or ill-being for all classes of fishers (representing different ethnicity and aquatic ecosystems) is difficult. Allison and Ellis (2001) argue that fishers' livelihoods are characterized by sustainability when they display high resilience and low sensitivity and by vulnerability when incidences of low resilience and high sensitivity are apparent.

The 'Sustainable Livelihoods' (SL) approach provides us with a new way of understanding the inherent complexities of poor people's livelihoods. SL is an interwoven concept of two multi-disciplinary conceptual schools - Sustainability and Livelihoods. SL is one '*which can cope with and recover from stress and shocks, maintain or enhance its capabilities and assets, and provide... opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term*' (Chambers and Conway 1992: 7-8). It is '*about meeting human needs, or maintaining economic growth or conserving natural capital or*

*about all three*' (Redclift 1991: 37). The concept of SL refers to both environmental (the external impacts of livelihoods on the local ecosystems, resource bases and others' livelihoods) and social aspects (proactively the struggle for an adequate and decent livelihood, and reactively peoples' capabilities to address negative externalities) in a more comprehensive and holistic way than any other approach (Chambers 1992, Chambers and Conway 1992, Sneddon 2000).

The research on SLs of the fishers obviously demands that it has to be at the interface of fishers' own capabilities and capitals, and their adaptive strategies against multiple cross-scale stressors that impact their livelihoods differentially. SL deals with certain social actors living in distinct agro-ecological systems. Linking the livelihoods with well-being captures both 'the objective dimensions of having to make a living to get by as well as the subjective dimensions of the conditions in which one lives' (Bebbington 1999, *cited in* Marschke 2005: 8). The advantage of the SL approach over 'sustainable development' is that it focuses positively on the livelihood strategies employed by disadvantaged people at the local level rather than concentrating on the macro-level development strategies cut off from the common peoples' lived experience (Sneddon 2000). Further details on SL are provided in the section 3.1.1 of Chapter Three.

Small-scale fishing illustrates a unique complex and dynamic case of human-in-nature systems. It is a major concern worldwide (Lawson 1978, Kurien 1996, Pauly et al. 1998, Berkes et al. 2001, Bene et al. 2004, Kooiman et al. 2005, Johnson 2006, Jentoft and Chuenpagdee 2009) from the viewpoint of threatened biodiversity, livelihoods of the dependent population, social justice, sustainability, poverty and resource governance. From the viewpoint of promoting social and ecological sustainability, the small-scale fishery deserves added consideration for political arguments and commitments at the global level (Johnson 2006). There is a critical need to acknowledge and examine the inherent diversity and dynamics of small-scale fisheries, and redesign policy instruments in the context of rapidly changing contexts of the fisheries (*Ibid*: 747).

It is difficult to categorize and define the boundaries and characteristics of the fisheries ecosystems comprising small-scale fishery. Jentoft and Chuenpagdee (2009) aptly termed fisheries and coastal governance as a wicked problem; they argue that many

problems of the fisheries are interconnected with other bigger problems, and there are hardly any easy technical solutions to those complex problems. In all considerations, the artisanal fisheries in Bangladesh are also complex and characterized by both quantitative and qualitative attributes: prevalence of simple to complex technologies, manual to motorized diverse crafts and gear operations ranging from a few hours to a few days, almost zero to high capital involvement, individual to group ownership patterns, social or caste identity of fishers, social and economic reciprocity and coercive dependence on network relationships and institutions, highly dispersed fishing areas and seasonality, various degrees of livelihood dependence, household consumption to international marketing, distinct gender roles, cultural and religious rituals, fishing pressures, low to high catch rates and targeted species, low earnings and the general prevalence of poverty among fishers.

There are sharp variations between fishing communities in all aspects of characterizations. Thompson et al. (1983) aptly mentioned they indeed defy any oversimplification of the general theories of social change, modernization and also the Marxist interpretations on proletarianization. New theories for the fishing communities are critically needed for proper interpretations and analysis of their livelihoods, process of marginalization and diverse knowledge base. Several arguments and conditions set the stage for this study. Despite the green landscape with its immense supply of fresh and coastal water, and a wide sub-tropical biodiversity, the fishers of Bangladesh have not witnessed significant improvement in their livelihoods. The technocratic 'quick-fixes' like privatization of open-water fishery through a 'bidding system' of common-pool resources served to promote a system characterized by short-term profit maximization for the leaseholders with consequent negativity like over-exploitation through unsustainable practices. It forced the shifting and disappearance of resources from the poor to the elites, and the demise of a highly developed indigenous knowledge system in many areas. The economy of these fishers is primarily subsistence<sup>7</sup> oriented, though some of them run on

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<sup>7</sup> As fisheries literature largely deals with biological issues and avoid human dimensions, subsistence fishing/fishers are little known and largely ignored or blithely acknowledged by policy-makers. Subsistence itself is a magic word with multiple connotations and contextual meanings. Schumann and Macinko (2007) argue that defining subsistence is difficult and must be a context driven exercise. In the context of rural Bengal, I define subsistence fishing as a mode of production intended to fulfill basic survival needs usually

commercial ventures. The coastal and floodplain ecological communities of the Bengal Delta have developed and reshaped their ecological knowledge, cultural heritage, local level resource management institutions, value systems and economic well-being through a long interaction with their immediate environment. This research responded to the needs of exploring the livelihood dynamics of the fishers, their overall socio-economic conditions and the cross-scale issues that impact their livelihoods.

The critical importance of the small-scale fisheries in Bangladesh can be inferred from the fact that almost all aspects of floodplain fisheries are traditional, and >90% of the marine catch is derived from this fishery, while the remaining contribution is by the export-oriented industrial fishery. Regrettably, there is an under-appreciation of the importance of fishery resources to rural livelihoods and national economic growth by the Government of Bangladesh and international development agencies. Budget allocations for the development of the fisheries sector declined over time despite its critical importance for the rural economy and national nutrition (Hossain et al. 2006).

The issue of fishers' livelihoods is widely neglected in both historic and recent literature. A limited number of earlier studies on fishers have been leveled off the brand of peasantry. Smith (1977: 2) observed that maritime communities have been greatly neglected in anthropological literature; despite heavy reliance on marine exploitation for most of the annual subsistence, the fishers are often placed narrowly in the form of footnote in anthropological literature- *'after which the author goes on to stress the land-based subsistence pattern'*. Historically, only a few anthropologists like Malinowski (1918), Hocart (1937), Radcliffe-Brown (1948), Firth (1946), Moses (1929), Punekar (1959), Ahmed (1966), Trivedi (1967) and Ward (1958, 1960, 1965) (*cited in Raychoudhury 1980*) have been keenly interested in studying the sociology of fishing. However, the attention to fishers' livelihood has been limited. In Bangladesh, research on fish far exceeds dedicated works on the livelihoods of small-scale fishers. In recent years, some useful research outputs are evident from the works of Alam (1996), Kleih et al (2003), Alam (2001) and Rashid (2005).

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with typical coercive or reciprocal production relations and cultural orientation mediated within complex social-nature relationships. Both subsistence fishing and fishers are characterized by resilience, labour-absorption, indigenous knowledge, poverty and chaotic management.

### 1. 3. Research questions and objectives

Understanding fishers' livelihood dynamics in their own local contexts is important. I want to hypothesize that *'an understanding and appreciation of the fishers' livelihoods dynamics within their situated socio-political-cultural constructs play critical roles in planning for empowering communities, betterment of livelihoods, and also fisheries resource management.* Within the purview of this hypothesis and given the prevailing socio-ecological complexities in the floodplain and coastal ecosystems of Bangladesh, this study examined the following broad research question: *'What can be learnt about the complex and dynamic nature of livelihoods within the domains of artisanal fishery and the 'fishantry'<sup>8</sup> as a distinct social class (see section 4.2 of Chapter Four for a detailed analytical treatment on fishantry), and what are the links of such a knowledge base for improving fishers' livelihoods and empowerment, and planning for fisheries resources sustainably?'* To address this broad research question, I studied two fishing communities (caste-based Hindu fishers and new entrant Muslim fishers) representing two distinct ecosystems (floodplain and coastal) and fisheries. The following four specific research questions have been formulated to substantiate the principal research question and the immediate objectives of the study.

***a. What are the social and economic structures and processes operating in the floodplain and coastal fishing villages of Bangladesh?***

What are the salient features of the fishers, and where are floodplain and coastal fishers positioned in the socio-economic continuum? What are the characteristics of the social structures and hierarchies in the fishing villages? What social institutions are in place and what roles do they play? What about the gendered roles of fishing women? What are the socioeconomic and socio-cultural processes and production relations that keep most of the fishers poor?

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<sup>8</sup> In its classical sense, 'fishantry' as a socio-culturally defined class embodies at least four distinct facets: 1. Indigenous knowledge and culture tuned to the way of life, and the ecosystem tuned to the aquatic ecosystems; 2. Use of physical labor of self-and-family and relative simplicity of technology; 3. Complex production relations and proneness of socio-economic subjugation to powerful outsiders; and 4. Professional identity marked by social groups or specific castes. Within the broader framework of fishantry, this research focused on the livelihood capitals and capabilities, the drivers of change and the coping strategies in two differing ecosystems.

***b. What capitals and capabilities fishers do have to make a living?***

What are the social capitals that determine fishers' networking abilities? What economic capitals do fishers possess? What natural capitals exist upon which fishers' livelihoods primarily depend? What are the indigenous knowledge capitals and how do the fishers use this knowledge? What are the rituals observed in the fishing villages and what distinct roles do rituals play? What kind of political networks and complex negotiations do fishers maintain?

***c. What are the cross-scale stressors that impact fishers' livelihoods and entitlements? How do the fishers cope with multiple adversities?***

What are the social and natural sources of vulnerability? How do aspects of food security vary seasonally? How do the existing economic institutions and coercive patron-client relations impact fishers' livelihoods? What are the coping actions that fishers undertake? What livelihood strategies do fishers adopt for diversifying incomes and how do they spread risks throughout their livelihoods?

***d. What are the policy instruments and fishery management approaches?***

What are the fishery policy narratives? How are fishers' entitlements impacted by policy-instruments? What are the conditions of the fishery management institutions and institutional partnership programs?

This research is intimately linked to sustainable development thoughts and practices, and it takes social, economic and environmental objectives into consideration. Among the social-economic objectives, the most important ones are equity, access to resources, livelihood security, share of food fish and active participation in resource management. Environmental sustainability objectives are addressed through the use of indigenous knowledge capital (human capital) and practices for ecological restoration and resource management. From the heritage point of view, documentation of time-tested cultural knowledge and endogenous technology deserve significant attention. Obviously fishers' empowerment and their active and sincere participation in the management process can help to ensure a sustainable resource base and resilient management system that buffers a great deal of change or disturbance, and complies with ecological, economic and social sustainability. One with low resilience has limited sustainability (Marschke and Berkes 2006, Berkes 2007).

#### 1.4. Organization of the thesis

This thesis comprises eight chapters that are choreographed to provide distinctive contributions in fulfilling the obligation of the research objectives.

*Chapter One* sets out the context of the research, the research questions and objectives, and the structure of the thesis.

*Chapter Two* narrates the methodology with a focus on the philosophy and significance of participatory approach. It also reflects on the research plan, the process adopted for the selection of study villages and an experiential view of some of the participatory techniques.

*Chapter Three*, after reviewing the existing body of literature, examines the sustainable rural livelihoods debates.

*Chapter Four* introduces a new analytical domain - 'fishantry' - for examining the socio-cultural, economic, technological, evolutionary, and resource governance aspects within artisanal fishery. It explores the ecological settings and social institutions of the two study villages, and critically observes the gendered roles of fishing women.

*Chapter Five* explores the capitals and capabilities of the fishers that they employ to make a living. Going beyond the contemporary livelihood frameworks, it incorporates political and cultural aspects of fishers as capital. The indigenous knowledge base of fishers and the cultural capital of fishers are given special attention.

*Chapter Six*, adopting an *emic* perspective, explores the multi-stranded drivers that directly or indirectly impact the livelihoods of the fishers. As perceived by the fishers, some pertinent drivers emanating from social and natural sources are analyzed in detail. It also analyzes the coping strategies adopted by fishers and aspects of livelihood diversification in the fishing villages.

*Chapter Seven* examines the policy perspectives related to artisanal fisheries management in Bangladesh and the local level resource management initiatives.

*Chapter Eight* concludes the thesis. Following a brief comparison between floodplain and coastal villages and fisheries, this chapter synthesizes the key findings and contributions of the research.

## Chapter Two: Methodology

*'I don't know the academic things involved in your research, but I can realize your aspirations. What I know is that you try to know about us and we try to know about you. Thus, we become intimate friends like brothers by the same mother. If the minds don't adjust well, nobody is likely to get any authentic information'* Udvab Jaladas, President, Cox's Bazar Fisherfolk Welfare Foundation, Moheshkhali Island.

### 2.1. Introduction

This chapter begins with an explanation of the importance of adopting a participatory approach, and subsequently provides justification of the methodological approaches adopted in this study. Some specific analytical techniques are examined. Research planning and data analysis processes are also appraised. Finally, the process adopted for the selection of the study villages representing two distinct ethnic communities and agro-ecological systems is analyzed.

### 2.2. Philosophical orientation for participatory research

Researchers usually employ their own research approaches persuaded by many other social scientists to arrive at rules for conducting research. In doing so, they either 'identify themselves' or 'are identified by others' as working within certain theoretical domains (Hessler 1999). For my research, I have used both qualitative and quantitative methods (with more emphasis on the former), and each approach has served different but complementary roles.

For decades, quantitative and qualitative purists have formed distinct schools of thought. While drawing on strengths and minimizing the weaknesses of both, a new 'mixed method' approach (Creswell 2003, Johnson and Onwuegbuzie 2004) evolved. Quantitative purists powerfully uphold that enquiries in the social discipline should be objective, emotionally detached, and uninvolved with the objects of study in much the same way that physical scientists treat physical phenomena. Conversely, qualitative purists assert that multiple-constructed realities abound, and time-and-context-free generalization of the realities is neither desirable nor achievable. Qualitative research is more concerned with the *what, how, why, where* and *when* of the things under query with a 'reflexive inquiry', while the quantitative approach tends to be confined to the amount or number of things being investigated. The digital divide among the paradigms is also

evident: quantitative methods are gradually becoming more dependent on high-tech tools in many of the advanced societies, while the qualitative methods seem to represent low-tech disadvantaged communities.

Practitioners adopting the qualitative route examine the humans in different social settings - their relationships to other biotic and abiotic things through their socio-cultural constructions. It assumes that human expressions of what they say and do are the mirror images of how they view their social world, and human behavior largely depends on a process of continuous learning rather than the biologically determined instinct (Cooley 1902, Blummer 1969, Dewey 1930, Mead 1938, *cited in* Berg 2004). Often it is not possible to remove cultural elements from their contexts. Thus qualitative research demands a systemic and long-term immersion of ethno-methodologists in the specific field of interests as the cardinal principle of sensing the interpretations of people's behavior along with implicit and explicit social rules (Sillitoe et al. 2005). In the case of real life-worlds, qualitative researchers try to focus on the naturally emerging languages and meanings that individuals assign to experience (Berg 2004:11). In contrast, quantitative methods usually have the merits of generalization, testing and validating already constructed theories about how things happen, and generating sets of numerical data which can be processed using statistical software. Survey method is typically deductive theoretically and relies heavily upon a well-thought and pre-tested research design (Williamson et al. 1982).

There are different schools of thought<sup>1</sup> and praxis about participatory research. Development practitioners have been proceeding in an entirely different direction, utilizing various approaches collectively known as 'Participatory Rural Appraisal' (PRA), the origins and strands of which have been aptly and popularly described by Chambers (1994a, 1994b, 1994c). PRA has been considered as a combination of approaches that provides people an opportunity to reveal and analyze the realities of their

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<sup>1</sup> There are quite divergent opinions on the qualitative and quantitative research approaches. Dabbs (1982) remarks that the two approaches are not distinct; the notion of quality is essential to the nature of things and the quantity is elementally an amount of something. Fred Kerlinger claims '*there is no such thing as qualitative data; everything is either 1 or 0*'. D. T. Campbell mentions that '*all research ultimately has a qualitative grounding*'. Qualitative research refers to the meanings, concepts, definitions, characteristics, metaphors, symbols and descriptions of things, while quantitative research refers to counts and measures of things (compiled from Berg 2004). However, it is important to consider the merits of both approaches.

lives and conditions, to plan themselves what actions to take, and to monitor and assess the outputs (Chambers and Blackburn 1996). Participatory research strategy is more responsive to exploring complex phenomena like artisanal fisheries and fishers that are situated and embedded locally.

With due attention to the holistic nature of generating information, participatory research is truly unique in content, focus and form (Ragin and Becker 1992, Hesse-Biber and Leavy 2006). It is a praxis rhythm of action-reflection where generated knowledge supports local actions; it seeks to de-elitise and demystify academic research, thereby transforming it as an intellectual tool which common people as 'organic intellectuals' can use to promote actions for their own desired change (Tilakratna 1990). Participatory approach allows a reversal of learning from local people directly, on the site, face-to-face, and such learning is rapid and progressive with the scope of conscious exploration, flexible use of methods, opportunism, improvisation, iteration and cross-checking (Chambers 1994b:1254). PRA embodies a paradigmatic shift from specialist-centred ego to pro-people thinking. An important antecedent of PRA is 'Rapid Rural Appraisal' (RRA) (e.g., Chambers 1981, McCracken et al. 1988), which makes it a quicker, more accurate and less expensive tool. In practical terms, RRA is extensively used as a didactic tool for development planning and evaluation in many developing countries. The difference between the PRA and RRA continuum is shown in Table 2.1.

**Table: 2.1 RRA to PRA continuum**

Research process	RRA	PRA
User communities	Donors, academicians	Development NGOs, ethnographers
Time of evolution	Late 1970s, 1980s,	Late 1980s, 1990s
Main innovations	Methods, team management	Behavior, experiential training
Mode	Elicitive, extractive	Facilitating, participatory
Ideal objectives	Learning by outsiders	Empowerment of local people
Long-term outcomes	Plans, projects, publications	Sustainable local actions and strengthening of local institutions
Information owned and analyzed by	Usually outsiders for their own professional interests	Local people for self-assessment and developing action plans
Methods used	Mostly oral tools	Both oral and visual tools

*Source: Modified from Chambers (1994a: 958- 959)*

To examine complex and dynamic issues, the advocates of the mixed research methods, better known as the 'third wave of research movement', find a new discourse

for methodological pluralism by mixing and matching quantitative and qualitative research techniques, methods, approaches, concepts or language that provides the square chance of exploring research questions. As an expansive and creative form of research, this third wave includes the use of induction (discovery of patterns), deduction (testing of theories and hypotheses) and abduction (uncovering and relying on the best set of explanations for understanding one's results) (Johnson and Onwuegbuzie 2004). In my research, the quantitative research provided me a gross scenario of what was happening inside the fishing villages, while the participatory techniques allowed me to get some answers of why things happened like that. The basic assumption is that things may not be as they seem, and hence, in-depth inquiry is demanded for understanding the knowledgeable 'case', rather than generalizing it to a population at large (Atkinson et al. 2001).

There is obvious fuzziness in the unit of analysis in this research, as field research spanned from individual to households to community. One of the advantages of the livelihoods approach is it makes no assumptions about 'community' (Allison and Ellis 2001: 385). Family, household and community are the concepts, research tools and foci of concern for social praxis that are central to social organization and social-ecological explanations of human behavior. Clay and Schwarzweller (1991: 2) argue that the 'domestic group'- individuals that constitute a 'household' through sharing of productive and reproductive activities and living arrangements, and the 'kin group'- individuals who relate to each other through common ancestry and marriage ties, may not be necessarily governed or guided by the same norms of behavior.

I use households and families as interchangeable descriptors assuming that the boundaries between household and family are fluid, and both refer to a physically identifiable residence and are organized through kinship lines and rules in the fishing villages. In the context of rural Bangladesh, household (HH) is considered as a composite social and economic (also cultural and political aspects of reproduction) unit consisting of one or more individuals who live together, and share both the 'roof' and 'the pot'; (i.e., dwelling place and food), income and labor for ensuring that 'mutual sharing exists and continues'. HHs are not static but extremely dynamic. Every HH serves basic functions of consumption, biological reproduction, social networking and distribution across members

as determined by sets of ideologies and values. The expansion and dispersion stage of poor HHs in the course of their domestic cycle are very critical in terms of exposure to vulnerability. I have seen that female-headed HHs in fishing villages, following the death or severe injury of male head, are usually forced into a process that can be termed as the 'feminization of poverty'. I purposefully choose individuals, households and the whole community as a social and economic class as units of analysis, shifting seamless between these levels of aggregations. In situations where production and ownership relations within the community or institutions are complex, interwoven and multi-layered with competing interests, I have surfed beyond the boundary of the study villages.

The two villages selected in this study represent two distinct cases of ecosystems and communities. To have an in-depth scenario of livelihoods, I selected five coastal and four floodplain families as 'cases' from the two study villages. This gave me a good understanding of the micro-level livelihood dynamics. Case study is considered as an important way of doing social research (Yin 2003), involving an in-depth longitudinal examination of a single instance or event (a case) without following a rigid protocol of variables. The case study approach (Yin 2003, Tellis 1997, Stake 1995, Ragin and Becker 1992) is particular, descriptive, inductive and ultimately heuristic as it seeks to illuminate the reader's understanding of an issue (Parlett and Hamilton 1972, *cited in* Stark and Torrance 2005). To Yin (2003), case study is a 'research strategy' that demands an empirical real-life for gathering multiple sources of evidences including even quantitative evidence. This systematic and focused way of looking at subjects allows researchers to gain a sharpened understanding of why the instance happened as it did, and hence to '*build upon theory, to produce new theory or to challenge theory*' (Tellis 1997). The strength of the case study approach is that it engages not only qualitative techniques, but it benefits through a mix of quantitative and qualitative evidence also (Yin 2003).

After spending sufficient time with the respondents and developing a sense of intimacy and trust, the researcher can generate a process of active dialogue that helps people in collective decision-making and action. It is quite evident from what one of my key respondents says: '*if the minds don't adjust well, nobody is likely to get the authentic information*' (pers. comm. Udvab Jaladas, Gorakghata, Moheskhali, 19 March 2006). I was aware that it is impossible to collect data and information on a cross-sectional single-

shot survey where sharp seasonal fluctuations (income, catch etc.) exist. So I adopted year-round observations and data gathering techniques. This helped me to know the actual rather than the hypothesized activities of the poor fishers, and how they changed over time.

During the field work, as a PRA practitioner, I was aware of the humanly qualities<sup>2</sup> and driving demands needed for facilitating participatory research. Considering the intricacy of the existing power structures, social relations, authority and gender relations, I created an enabling, friendly and open environment during my field work with the communities so everyone could share his/her knowledge and opinions in a friendly environment without any hesitation. Berreman (1962) in his classic monograph ('Behind Many Masks') on a Himalayan village mentions that 'impression management' in 'the field' through creating particular effects among the potential respondents by conveying certain human roles and reciprocity is important for the ethnographers. Not all the research events were equally fruitful. In working with fishers, I remembered that *'there is a time for creating amid the rush and push of other things...there is a time for producing with plenty of resources and a time for producing with none. And there is a time for working in trouble and a time for working in peace'* (Hillary 1982: 205).

### **2.3. 'Menu of the methods'<sup>3</sup>: An experiential view**

This section highlights the most frequently used participatory techniques employed in the exploration of local knowledge and livelihood perspectives. Table 2.2 shows the frequency of the techniques used and Table 2.3 reveals specific techniques for exploring

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<sup>2</sup> Serendipity plays a critical role in field research. Incidentally, one bag of my O+ blood for a poor fisherman 'Jogendra Jaladas' was immensely helpful in establishing my image as a friend and well-wisher among the Hindu fishing community of Cox's Bazar. The patient was a victim of maltreatment. I helped him take legal action against the quack doctor and managed compensation worth Taka 75,000 (around US\$ 1100) for the victim. Such humanitarian services were something unexpected for the fishers; it was quite unexpected and mind-boggling for the caste-based fishers that an educated person from a so-called higher caste and social status would donate blood for a low-caste fisherman. The services I extended to the victim made me easily acceptable and popular in the community. What a helpless community it is indeed! Later I established networks between a voluntary blood donation group and fishing community's organizations, so that these neglected fishers could access to blood in case of an emergency. As I worked for the Food and Agriculture Organizations (FAO) of the United Nations, I was able to channel resources for establishing schools, a village resource centre, small-scale business, organization building and community empowerment in the fishing villages of the Cox's Bazaar district through the UNDP funded 'Empowerment of Coastal Fishing communities for Livelihood Security Project', BGD/97/017.

<sup>3</sup> The term was first used by Chambers (1994b: 959)

certain knowledge. I used the tape recorder initially, but soon discovered the fishers had some inhibition about it, as they tended to conceal authentic information for some unknown fear and hesitation. Realizing this situation, I abandoned the idea of using any electronic device except for a digital camera, the output (see Appendix 5, Plate A) of which the fishers enjoyed to watch.

In the course of interviewing, I remained vigilant about the fishers' sentiments. I knew that elder fishers do not like to see strangers wearing sunglasses (considered a source of audacity to the seniors) or a hat (*sahebi tupi*). In most cases, I wrote field notes quickly and elaborated on those the same day or night so no important piece of information was lost from memory. I allowed sufficient time to show sympathy when someone talked about the bad moments of life. There were situations when it was difficult to take field notes and I considered it wise to just listen and not to write immediately. Each interviewee is a unique character and I adjusted accordingly. At the end of each interview or group discussion, I had a quick ocular scan on the field notes to assess if I have covered everything properly.

**2.3.1. Participant observation:** This technique appeared to be the most useful, effective and straightforward way to learn about people's livelihood dynamics, motives, values, beliefs, interests, and their indigenous knowledge directly and confidently in a natural/social setting through immersion into the local cultural milieu. The participant observer comes to a social situation with the purpose of engaging in activities appropriate to the situation and observing the activities, people and physical aspects of the situation (Spradley 1980). Activities like voyaging with fishers, carrying out need-based complementary roles in the fishing operations, and attending numerous rituals in the fishing villages helped me immensely to become a part of the real world of fishers. I observed that fishers are more generous and participatory in their responses 'on boat' than 'on land'; they appear more thoughtful in the evening and night. The night halt with the fishers in the *haors* and the sea proved very useful for directly learning about their indigenous ecological knowledge.

**2.3.2. Semi-structured key informant interviews:** Along with an eye for participant observation, developing an ear for interviewing is essential for field research. The most

important information in research comes from semi-structured interviews if one knows what to ask, how to ask and whom to ask (Pido et al. 1996). I knew that all fishers in the community are not equally knowledgeable on social, cultural and indigenous knowledge aspects; it was therefore important to identify the key informants. The criteria I set to identify key informants are: 1. at least 10 years of fishing experience, 2. dependence on fishing for livelihood, 3. reputation in the fishing community as knowledge holders, and 4. willingness to share. I conducted open-ended interviews to gather information on issues of vulnerability, coping strategies, livelihood diversities, fisheries resources, gears, indigenous knowledge, conflicts, changes in fishing regulations, local institutions and other factors. One advantage of the key informant interview was I could read the respondent instantly. Interviews are best conducted when the interviewees have no difficulty in remembering or describing something related to their field. For these reasons, fishing boats were found to be the best places for interviewing the fishers. To talk with women, I avoided entering the house in the absence of male counterparts as an obvious way of showing respect to the social customs. Most of the time, I talked with them while they were cooking, chasing head-lice<sup>4</sup> or doing other household activities in the open backyard areas of the homesteads.

I also learned from informal chats (*'aadda'*) in tea stalls, where fishers talk spontaneously while they take hot tea and cookies. Tea stalls, rendezvous of common people, are thus the most appropriate public places to verify information in the presence of experienced fishers. I always seized the opportunity to share and appreciate their comments, and at one stage involved them in the desired discussion with another round of toast and tea. Passing or throwaway comments sometimes provided important information and new thoughts.

**2.3.3. Focus group discussion (FGD):** FGD is now widely used in participatory research. In organizing FGD, I took into consideration the 'existing relationships'<sup>5</sup> among

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<sup>4</sup> Chasing head-lice in a group is a social activity of the women in the fishing village. Usually they do not use any medicine to get rid of head-lice. They apply coconut oil on head to chase head-lice easily. Fishing women claim that the activity enhances 'sense of cordiality' among the neighbors (Annex 5, plate 5A5).

<sup>5</sup> In the fishing villages, there are familial disputes on some material issues among some fishers. If invited together, these fishers who were hostile to each other might exchange hot words when they get chance. One tries to undermine and challenge information given by another with whom s/he is not friendly.

members. This technique yielded a substantial amount of interactive information from the target group. The scope of error or bias is comparatively less, and as a group view, the information is more reflective and accurate for the whole target group. FGD was effectively used to collect and validate information related to production relations, changes in livelihoods, coping actions, livelihood diversity, rituals, social and economic institutions, and indigenous knowledge. A small group of 5 to 7 fishers was effective; however, for opinion judgment, larger groups were consulted.

**2.3.4. Household level case studies:** Case study as an approach to research has been fed by many different theoretical tributaries and sciences giving far more emphasis to the 'objective observer' for in-depth study of 'the case'. In the process of 'I see the case and I am seen', a friendly relationship is built with the participant, and developing a pleasant relationship is important for collecting detailed authentic information.

As mentioned earlier, selective case studies were carried out at the household level, considering each household as a unique case. The cases I selected represent prototypes that highlight more general characteristics of the villages. They allowed me to know about household stories, vulnerability, coping strategy, conflicts, pains, happiness and daily struggles. As I was curious to have in-depth knowledge on the aspects of fishers' livelihoods, I made repeated visits to each of the 5 coastal and 4 floodplain households for 14 months (Table 2.2). As a result, their livelihood struggles, coping mechanisms and effects of seasonality in their lifestyles became vividly apparent to me. Special arrangements were made to communicate with some key informants in the years 2008 and 2009 as and when further clarity on certain issues was needed.

At the initial stage, it was not a welcome scenario in the cases of the Volarkandi village women, mainly due to the traditional social conservatism of rural Muslims. However, things changed quickly in less than two months. Sajeeb Ali (48) of Volarkandi village articulated his concerns:

*'My whole life's valuable experience is known to you in a few months; the documentation will benefit you; people will know you; you will earn reputation home and abroad; ...the history of our poverty and our knowledge on fishery will be a capital for you; the 'upper class' survives on 'lower class' this way. Still, we trust you and thank you for your concerns for us. Who comes to see us if there is no self-interest?'*

In a process of triangulation between narration and observation, I obtained a real-life sketch of the fishers, which could not be obtained from a one-sitting case study. At the later stage of the field research, I tried to pave networks between village organizations and different development agencies to relieve their livelihood burden.

**Table 2.2: Major events of field research spread over a period of 21 months**

Techniques	Coastal	Floodplain	Remarks
Key informant interview	45 fishers	27 fishers	Each KI interviewed 2-5 times for several hours; total interview frequency is around 250
Focus group discussion	23 events	19 events	With varying number of participants and on varying issues
Voyage with fishers for direct observation	5 nighttime and 23 daytime voyages	19 day-long voyages	Duration of each sea-bound voyage ranging from 7-36 hours
In-depth HH level case studies	5 families	4 families	Total frequency around 125 over a period of 14 months
Interviews with DoF and NGO personnel	17	15	Frequency ranging from 1-2 with each personnel
Baseline survey	78 families	60 families	Socio-economic attributes
Mini-workshop	5 events	3 events	Validation of information

**2.3.5. Other participatory techniques:** The seasonal calendar illustrates the complexities and dynamics of fishing and rural life during different months of the year. Resource mapping techniques helped me to depict the resource or capital of the village/community. It is an important step to go further for community-based planning for the management of different resources. The SWOT (Strength, Weakness, Opportunity and Threat) analysis provided comparative statements about formal and informal institutions, and NGOs and money lenders. Wealth ranking was helpful in categorizing community members on the basis of wealth; matrix ranking allowed me to see the options available against perceived problems; time-line analysis and an impact diagram provided an understanding of the history of certain events or changes. These were carried out in small groups.

## 2.4. Specific analytical techniques

Table 2.3 provides an analysis of specific tools used for gathering specific information. A combination of tools was used in each case for the purpose of validation.

**Table 2.3: Some specific tools for attaining research objectives**

Context	Research issues	Techniques
<b>Complexities and contexts</b>	Demographic condition (family size, composition, sex, age, religion, dependency ratio or civilian labor force); social hierarchy and institutions, social and economic organization of fishing, kinship analysis, gender role, fishing technology, production relations and exploitation.	FGD, PO, KI, P, C, SWOT, survey, MW
<b>Fishers' capitals</b>	Physical capital, financial capital, resource use pattern, political aspects of powerlessness, fishing technology.	Survey, FGD, KI, PO, 'aadda', MW
<b>Belief system</b>	Numerous pre-voyage and post-voyage rituals	PO, KI, story telling
<b>Fishers' knowledge</b>	Indigenous ecological knowledge, resource degradation issues, natural resources and their fluctuations.	PO, FGD, KI, C
<b>Livelihood aspects</b>	Economic information (income with seasonality, income sources and divergence, main and subsistence sources, contribution from fisheries and agricultural sources, debt situation); sets of vulnerabilities, coping strategies, livelihood diversification and moral economy.	Survey, FGD, PO, KI, C, 'aadda', resource mapping, seasonal calendar, story telling, MW
	Intensive household level study	PO, C, story telling
<b>Fisheries policy and management</b>	Current status, changes over time, leasing system, community participation, local management efforts, policy analysis, resource control and power, local management initiatives	FGD, PO, KI, MW

*Key: PO- Participant observation, KI-Key informant interview, FGD-Focus group discussion, C- Case study, P-Photography, SWOT-Strength, Weakness, Opportunities and Threats analysis, 'aadda'- Tea stall based informal discussion, MW: Mini-workshop*

## 2.5. Research plan and process

Initially, the field study was planned for one year. Subsequently, it became clear to me that developing a clear understanding about fishers representing two different ecosystems and fishers' groups would require more time. Eventually the field research was extended to 21 months. The research was planned and conducted in three stages: 1. reconnaissance survey, scoping and learning-gathering, 2. in-depth field work and 3. triangulation/verification. I started full-swing field work in late January 2005 and continued up to September 2006. Prior to that, I visited some fishing villages to get primary ideas about the potential sites (Table 2.4).

At first I started investigating at the community level to get a broad overview of the concerned phenomena; the search was made through small focus group discussions. After sensitizing the community about my research, I entered at the individual level (key informant) and household level for gaining in-depth information. Such a slow but gradual

engagement with the fishers proved effective in my research. After field-testing in other fishing villages, I administered a questionnaire survey among 78 coastal and 60 floodplain households (see Appendix 1 for the questionnaire) to get an overall perspective of livelihood issues. However, the preliminary long questionnaire was curtailed and simplified to suit the local contexts and vernaculars. After that, I focused fully on participatory techniques and direct participation/observation. Detailed data analysis was carried out including frequency and cross-tabulations, and shared with fishers in mini-workshops. Whenever I obtained conflicting information on any issue, I sat with the expert elders from the same and nearby fishing villages to learn more and validate the information.

I studied marine science, aquaculture and fisheries resource management in different universities of Bangladesh, United Kingdom and Canada, and worked with the fishing communities for more than a decade (being involved with development agencies like Community Development Centre-CODEC, DFID and FAO/UNDP). I am implying, my knowledge was used in the study as an independent observer, both in the sense as an input to the findings and also unavoidably as a basis of reflection. The hybrid between disciplines and field works heavily influenced me to flexibly run for interdisciplinary approaches, thus surrendering my earlier reductionist academic orientation.

This being the case, I already had profound knowledge and experience about the fishing communities and different aspects of the Bangladesh fisheries. I had intimate relationships with many village leaders and hundreds of fishers, and such friendly relations proved useful in the whole tenure of my field research. To learn from them, I demanded hundreds of fishers of different ages myriads of times to the extent that they became tired and said 'no' to me. I was trusted with many kinds of personal information that I ever wanted to know. I never used the 'standard official language'; rather I used local dialects in both the communities to retain information or ideas intact in the course of translation, to keep the discussion lively, and to maintain friendly environment.

## **2.6. Data analysis**

Given the fact that I conducted the research in two villages representing two distinct ecosystems and social groups at multiple scales spanning from the household to the

community level, a voluminous information base was generated. In writing a doctoral thesis based on my long field works with the fishers, I faced a struggle of representation, emanating from an oscillation between two epistemological stances- the '*emic*' perceptions and voices on infinite complexities of fishers and the '*etic*' impartial views of facts and findings of the researcher. Sufficient time was taken to patiently organize unbiased information into different categories of knowledge. I relied on simple arithmetical methods for analyzing quantitative data. Each chapter is a conglomeration of a range of data, important quotes, community perceptions, and my own observations wherever applicable as an independent observer. Maps and other community-drawn pictures were redrawn exactly and scanned to fit paper size. As generously permitted by the fishers, quotes have been cited properly with their name, respecting their perception on certain issues. I maintained anonymity and confidentiality wherever deemed necessary.

Rather than organizing formal workshops, I conducted informal mini-workshops (five with coastal fishers and three with floodplain key informants) with a view to validating important information gathered from individuals. The genuineness of the information presented makes this thesis an authoritative interpretation about fishers' livelihood dynamics. I received supports from my networks and friends in DoF (Department of Fisheries, Government of Bangladesh). In essence, this thesis relies solely on common people's information (i.e., *emic* perspectives, *etics* used to examine the *emics*, in researchers' words).

## **2.7. Selection of the study villages**

Using a comparative case study approach, I examined the livelihoods of fishers of floodplain and coastal areas with connected attributes. The selection of the study villages was a learning process too. Purposively I developed some criteria (Table 2.4) for the selection of the study villages.

To cover the diverse ecosystems ranging from freshwater to coastal peripheries, I visited a number of sites in Bangladesh during November-December 2004. My supervisor and one of the committee members also visited some of the primarily selected sites. I also shared with personnel of locally active NGOs (CODEC, CNRS, ASC, BRAC,

Proshika and MUKTI), ECFC and CWBMP projects, WorldFish Center, DoF, local school teachers, fish traders and community members to get impartial impression about fishing villages. After an examination of the pros and cons of different sites (Table 2.4), ‘Thakurtala’ of Moheskhali Island and ‘Volarkandi’ of Baralekha upazilla, Moulavibazar, were finally selected (Figures 2.1, 4.1 and 4.3) to represent different ecosystems and socio-religious patterns (see section 4.3).

**Table 2.4: Matrix of decision making for final selection of the study villages**

Potential sites	Time-tested knowledgeable respondents *1	Community cohesiveness & attitude *2	Location & 'ecosystem community' attributes *3	Livelihood & professional diversity	Prevalence & functioning of local institution *4	Gender sensitivity *5	Personal familiarity
Thakurtala *F Moheskhali	+++	+++	+++	+++	+++	+++	+++
Kaibartapara, Kutubdia	+++	+++	+++	++	+++	+++	++
Maizghona, Chakaria	++	+++	++	++	++	+++	+++
Ahmediakata, Moheskhali	+	++	+++	++	+	+	+
Volarkandi*F Borolekha	+++	+++	+++	+++	+++	++	++
Gobindapur, Kulaura	+	+	++	+	+	++	+
Pabijuri, Borolekha	++	++	+++	++	++	+++	++
Shaldighi, Borolekha	++	+	++	++	+	+	+

*Note: +++ Highest, ++ moderate, + minimum*

*\*1 Prevalence of old experienced fishers, story teller, active fishers of varying age, availability for interview*

*\*2 Community functions, connectedness, joint rituals, positive attitude, willingness to share*

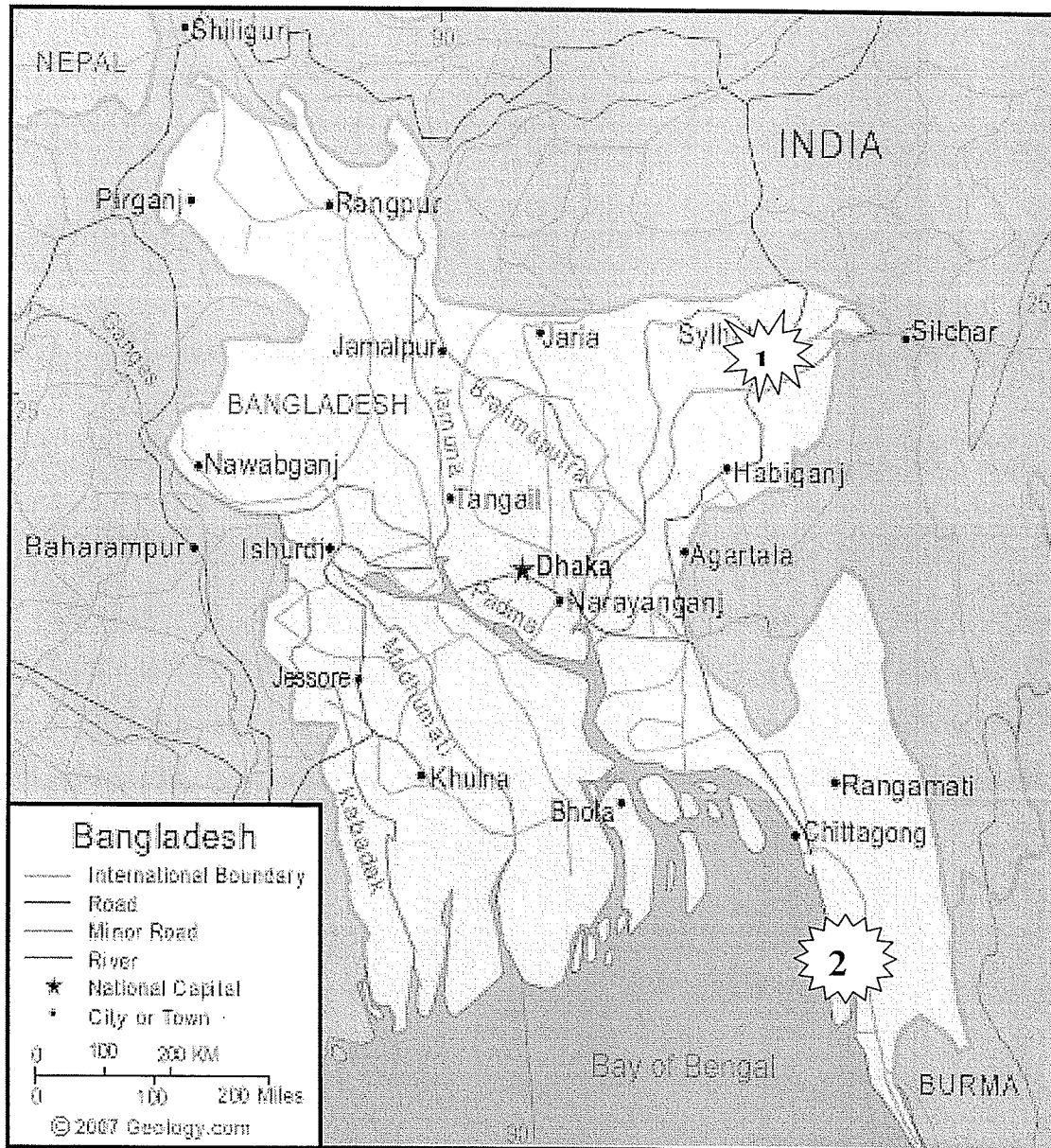
*\*3 Distance from waterbody, dependence on natural resources for livelihood*

*\*4 Traditional leadership, local resource management system*

*\*5 Women's distinct productive role, willingness to share, degree of social conservatism*

*\*F-Finally selected as study village*

However, in my quest for the indigenous ecological knowledge and socio-cultural diversity, I interviewed some experienced fishers of different neighboring fishing villages. Some of these villages are *Pabijuri*, *Shaldighi*, *Kontinala* and *Juri* in the floodplains, and *Gorakghata* (Moheskhali Island), *Boroghope* (Kutubdia Island), and *Maizghona*, *Boalkhali* and *Tarasghata* under Chakaria upazilla (Cox's Bazaar district) and *Selmipur* fishing village under Sitakunda upazilla (Chittagong district) in the coastal region. Section 4.3 of Chapter Four deals with the salient features of the study villages.



**Figure 2.1. Map of Bangladesh showing the floodplain and coastal study areas**

(Source: <http://geology.com/world/bangladesh-satellite-image.shtml>)

Key: 1. Hakaluki haor of Moulavibazar district, Sylhet division representing floodplain zone  
2. Mohekhali Island representing coastal ecosystem

### Chapter Three: Conceptual Considerations

This research examines the complex and dynamic nature of livelihoods within the domains of artisanal fishery and the fishantry as a distinct social class, with a view to link the lessons and knowledge base for improving fishers' livelihoods and sustainable planning for fisheries resources. In doing so, the sustainable livelihood framework provides an over-arching analytical tool.

This chapter first examines the conceptual underpinnings of rural development, and then proceeds to discussions on the sustainable livelihood framework. Valuing the culture-specific *emic* approach to examining the local-level livelihoods is important as the facts and information come from the members of the fishing communities. The *emic/etic* blend is very useful for providing analytical treatments to the locally-specific facts using different conceptual lenses. Hence, along with the *etic* perspectives of livelihoods in the contemporary literature, the *emic* views are also reiterated to bring into view local perceptions and realities. It is argued that the contemporary livelihood frameworks which put heavy emphasis on peasantry do not fit well to provide a comprehensive analysis of the small-scale fishers. The intent is to develop a Sustainable Livelihood Analytical (SLA) framework for studying small-scale fishers as a particular social and occupational group different from other generalized rural inhabitants. Fishers as resource-dependent communities are largely dependent on politically-mediated decisions that impact the access to and control over natural resources. The SLA framework that put forward here benefits from the conceptual lenses of vulnerability, entitlements, livelihood strategies and resilience.

#### 3.1. Development paradigm and Sustainable Livelihood Analysis (SLA)

Development<sup>1</sup> as a concept is often viewed simply as the progression of human life. Pretes (1987) argues that development as perceived in the Western worldview<sup>2</sup> has no

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<sup>1</sup> Rigg (1984, cited in Pretes 1997) found 72 definitions of development in political economy literature and the term 'development' has largely replaced terms such as 'progress' and 'evolution'. Some terms like 'change', 'growth', 'transformation', 'Westernization', 'industrialization' and 'modernization' are closely linked to the idea of development. To him, in social science at least, 'the word typically suggests the evolution of human social systems from simpler to more complex, mature or higher forms....in all domains, 'development' has to do with a very general process of unfolding designed to realize or display something'.

end: it is infinite and continual in nature. In practice such an understanding is deeply rooted to the Western culture, and development practices in the developed world involved control over and transformation of nature to serve human needs. It is understood that the development paradigm influenced by Western philosophy largely failed in many developing countries like Bangladesh to invest in people to make them capable of obtaining basic needs and then gradually improve their quality of life. Consequently, a 'culture of poverty' developed among the rural inhabitants of Bangladesh characterized by attributes like a strong feeling of deprivation and marginality, powerlessness, personal unworthiness, the prevalence of caste-based 'low-classness' and fatalism, a belief in male superiority, deeply-embedded loyalty extended to leaders and religious institutions, absence of class consciousness, and conflict among different institutions. As an alternative to the Western classical and neo-liberal development paradigms, Chambers' (1997b: 11) interpretation of development as '*responsible well-being by and for all*' with notions of well-being, livelihood, capability, equity, sustainability, and social justice strongly represents the 'neo-populist' development paradigm. This is how the environmental issues are intimately connected to the social ones; such interconnectedness asks for a broader interdisciplinary perspective transcending conventional institutional and professional domains (Blaike 2000).

Concern over sustainability - as applied to development, societies, livelihoods and a host of additional social, economic and ecological activities - has recently emerged as a major development issue. The concept of 'Sustainable Development' (SD) profoundly promotes a middle discourse for reconciling the discordance between finite resource bases and emerging environmental and social problems on one side, and infinite development and economic growth on the other. There are several interpretations of this new development approach, but the common line of agreement recognizes there is a certain ecological carrying capacity of the planet that necessitates ecologically legitimate growth. The now famous and much popularized Brundtland Commission (WCED 1987: 43) defines SD as '*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*'. Two key propositions are

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<sup>2</sup>Pretes (1997) remarks that the praxis of Western development has presented itself in two ways: first as a process of controlling and taming nature (deemed separate from humanity) for the benefit of society; and second as a process of bringing all other societies into the Western worldview.

inherent within this definition: 1. the concept of 'basic needs' of the world's poor to which overriding priority should be given; and 2. the idea of 'limitations of nature's carrying capacity' to meet ever-increasing present and future needs. The concept urges that growth must be revived in developing countries because that is where 'the links between economic growth, the alleviation of poverty and environmental conditions operate most directly' (WCED 1987:43-51). Sachs (1997) views SD as '*a marriage of developmentalism and environmentalism*'. Sneddon comments that the concept of SD has reached a conceptual dead-end (2000: 521).

Within the concept of SD, there is a central tension between advancement in human well-being and environmental conservation for future generations (Qizilbash 2001). UNDP's (United Nations Development Program) view of development builds on the work of the 'basic needs' school (Stewart 1989) and Amartya Sen's well-known definition of development as a 'capability expansion' (Sen 1984, 1990, 1999). Naess (1989) focuses on ecological sustainability; and Pearce et al. (1988) focus on achieving social goals. Barbier (1987), Tolba (1987) and McCormick (1991) view SD as a concept that is more concerned with securing livelihoods and reducing dire poverty of the world's poor and aiming to halt resource depletion, environmental degradation, cultural disruption and social instability. Munn (1989: 50) argues that development, to be sustainable, requires profound changes in political, social, economic, institutional and technological order, including redefinition of relations between developing and developed countries and a succession of technological break-throughs (also see Strong 1992).

### ***3.1.1. Development to sustainable rural livelihood continuum***

This section examines both the *emic* and *etic* views of livelihoods, focusing on the definitions and operational aspects of the two views. Detailed analytical treatments on the sustainable livelihood framework follow in section 3.2 of this chapter.

**The *emic* perspectives of livelihood and poverty:** The word 'livelihood' signifies diverse meanings to the fishers of different wealth categories ranging from 'just a meal to living with dignity' (*jibika*, *beche thaka*, *onno sangsthan*, *khaoa*). Some *emic* views of livelihoods are expressed by the fishing community members:

*'the struggles to manage two meals a day with family members'* (Shamsul Islam, 50, extreme poor, Volarkandi fishing village, Baralekha)

*'it is a mechanism of surviving; just breathing and mere living with whatever little foods I can manage from the village and outside; a 'sharee' for wearing and a small quilt in the winter'* (Padmaboti Jaladas, 65, a destitute woman, Thakurtala)

*'a better quality food, housing and sleeping at night; no humiliation for caste identity'* (Shimul Jaladas, 24, poor carpenter, Thakurtala fishing village)

*'better curries for meals, a little saving, a regular income flow, dignity (maan-ijot), no crisis during lean period'* (Mridul Jaladas, 45, medium rich fisherman, Thakurtala)

*'an income source for regular meals in all seasons, better medical facilities and survival with dignity'* (Aroti Jaladas, 55, poor woman, Thakurtala fishing village)

*'living with honor; doing something for future generations; living a better life without tension (Jhamela/chinta)'* (Sunil Jaladas, 47, moneylender, Moheskhali)

While the issue of decent living is also an ambiguous and unquantifiable matter, the issue of 'making meals'- i.e., food security- has been captured widely from the response of the fishers. For one of my destitute respondents, it is not only about life but also about death, an early death<sup>3</sup> which can put an end to her sufferings. Livelihood thus immediately represents a temporal framework to respondents: living at present and sustaining in the future. To the destitute, livelihood means just to survive somehow, whereas it is living with dignity and sustaining wealth for future to the socio-economically well-off class.

Much of the livelihood interpretations in contemporary literature are linked with income poverty and human poverty, both in absolute terms (a narrow material sense as the inability of individuals to ensure very basic needs and a minimum standard of socially acceptable living) and in relative terms (in a broader sense, generated from cross-scale social and institutional inequalities resulting in an inconsistent allocation of resources needed for livelihoods) (Khan 2005). The classification of the fishers strictly based on 'wealth category' appears to be problematic. Poverty of the poor fishers is evident from their poor meals, housing, physical appearance and clothes. However, livelihood standards might not be necessarily reflective of the wealth status. A few wealthy boat owners kept a low profile in terms of basic amenities to avoid local hooligans and pirates

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<sup>3</sup> One popular saying is often heard from the old people in rural Bengal- '*hori dinto gelo sandhya holo par koro amaare*' meaning 'oh God, my days are gone, it is evening now, get me carried to the other side of the river soon'. This saying connotes a deep sense of helplessness, old age suffering, and the lack of basic necessities of life.

'watching them'. In the contemporary poverty typology, phrases like 'chronic poor', 'extreme poor', 'always poor', 'hardcore poor', 'poorest of the poor', 'ultra poor', 'destitute' and 'most vulnerable' are in use. While these typologies describe some aspects of poverty, they cannot capture the multi-dimensionality of poverty. The economic condition of fishers that we intend to label might change even within days.

I argue that poverty has cross-scale variation ranging from the individual to the community level. First, at the individual level, those who are victims of accidents, old, physically or mentally handicapped, and attacked by diseases are poor. Second, at the household level, families usually characterized by old persons, sick family members, deceased income earner, widow as family head, too many children, too many girls ready for social marriage, less or no male members and less educated/skilled members are most vulnerable to impoverization. Third, at the community level, the communities characterized by low social and caste status, religious minority, geographical isolation, poor infrastructure and political powerlessness fall behind other communities of the same region. There is also a well-built temporal dimension of poverty: some are born in a vicious cycle of 'old poverty', while some are 'tomorrow's poor', whose status might change depending on the dynamics of stressors and level of resilience. Some interpretations<sup>4</sup> of the poor available in the literature were difficult to apply to the fishers (see the footnote for details).

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<sup>4</sup> Rahaman (1995) defines 'poorest of the poor' as those forced to subsist on an intake of <1740 Kcal/day with a per capita income less than three-fifths that of the poverty line. Bangladesh Bureau of Statistics (BBS) and the World Food Program (2004) define 'absolute poor' as those with an average intake of <2122 Kcal/day, whilst 'hardcore poverty' is referred to an average intake of <1805 Kcal/capita/day. BRAC (2001) views 'poorest of the poor' as those having characteristics like: possession of 0.1 acres of land, full dependence upon seasonal labor, recurring food insecurity, having no or very low productive assets, living in very poor quality houses, depending on a single-income earner (female-headed household), and having a disabled husband. PROSHIKA (NGO) views 'extreme poor' as people with up to 0.5 acres of land, and landless male and female-headed households and those who sell labor.

The Government of Bangladesh defines those women as vulnerable who are widow, abandoned or divorced; functionally landless (<0.5 acre land), earning <Taka 300/month (around US\$ 4.5); reliant on income from daily manual labor; without productive assets and not members of any other developmental program. Hulme et al (2001) define 'chronic poverty' as 'inter-generationally transmitted' and 'always poor' as those with continued landlessness, few assets and continued poor health and the 'usually poor' as those who continue to have low levels of assets and continue to lack opportunities to accumulate. UNDP views poor as those with <1US\$/day (*synthesized from Khan 2005*). Which source of data one can rely on? BIDS (Bangladesh Institute of Development Studies), using quantitative methods, estimated that 47% of the rural households in Bangladesh were poor, while in the same year, adapting participatory poverty

To get a picture of the conditions, I adopted the anthropological approach of using an 'insider view' of fishers ('*emic* approach') to classify the poor. In a series of interviews and focus group discussions with the adult fishers, I asked them to help me understand the meaning of poor in their villages. Going beyond the conventional income-based poverty measurement, they came up with a variety of innovative and unconventional ideas and indicators. The *emic* classification of rich and poor are furnished in Table 3.1. The way fishers use the Bengali terms to denote different levels of poverty do not necessarily correspond to the literal classification of the poor. Some corresponding typologies bearing different connotations, like '*nissho*' (having nothing), '*oshohai*' (helpless), '*dustho/mora-dhora*' (destitute), '*kamla/ gour/ pounna*' (physical labor-based), '*vadhaimma/ bhodai/ bekar/ niskorma*' (jobless) and '*vikkuk/ fokir*' (beggar) are in use. Additionally, I got some simple interesting markers of the rich and the poor from a group of children from the fishing community:

**Rich fishers:** '*keep maid servant; talk with 'loud voice'; can afford to eat anything they want; can enjoy soft drinks 'Coca-Cola/Pepsi' when thirsty; have multiple sources of income; have links with 'big men' of the society; use toothpaste and brush; use perfume, cell phone and television; have own sanitary latrine and tubewell in the homestead areas; drink tea with milk; have multiple sets of dresses; sleep on beds; eat breakfast with loaves; eat square meals, can eat chicken when they want; get 'social invitations'; spend a lot for dowry and marriages; ride on rickshaw instead of walking short distance; use shoe and pants*'.

**Poor fishers:** '*thin; work as laborer ('Kamla') for the rich; often remain hungry; pale looking and body does not shine and look older compared to age; do not have separate kitchen and necessary cooking stuff; fall sick frequently; use mango leaves or 'neem' wood for brushing teeth; wear torn or faded clothes; have deformed houses with leaky roof; girls waiting for social marriage; do not have to use 'toilet' regularly as their stomachs remain empty; no regular source of income; keep walking as they can't afford to ride on rickshaw*' (excerpts of discussions with students, age group 7-12, Thakurtala fishing village, February 2006).

It is apparent from Table 3.1 that, unlike peasantry, fishers have little dependence and orientation on land ownership as a source of wealth and social prestige. Rather it is ownership and the types of crafts and gear that make a difference in the wealth category.

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assessments, 'Shamunnay' (research focus NGO) showed 75% of the rural households were poor (Rahman 2002).

**Table 3.1: Classification of homesteads based on criteria locally developed by fishers (1US\$= Taka 65)**

Category	Indicators- coastal site	Indicators- floodplain site
Rich ( <i>dhoni, paisavala, boroloke, jamider, bohodder, vaggyaban, londoni or dubaiwala</i> )	Have mechanized boat with higher engine power; multiple number of gear; moderate to good housing conditions; content with basic amenities with 3 square meals irrespective of seasons; good connections with businessmen and local administration; controlling power on community; not under current debt except business transactions; usually no unnatural sick persons; better access to education; independent of economic safety nets <sup>5</sup> ; socially dignified; no serious downtrend in business; income always much higher than expenditure; can engage fishing labor; annual familial income above Taka 200,000 (US\$ 3077); ability to repair or improve house annually; better family literacy.	Have new/big/good quality boat(s) and nets; leased small to medium sized beels (<100 acre) from the government; family member(s) as remittance earner; arable land of > 1-2 acres; socially dignified and powerful with good connections to government offices and police/courts; brick made or full tin houses; annual familial income above Taka 300,000 (US\$4615); much higher income than expenditure; independent of economic safety nets; substantial amount of deposits in banks; ample food and clothes; better family literacy.
Medium/higher medium ( <i>moddhyabitto, majhari grishosto, uthi grihosto, sochol, noya bohodder</i> )	Have boat(s) mechanized (low HP) or non-motorized; multiple number of gear; moderate housing condition with tin roof and bamboo walls; some form of usual debt; higher social status; rising economic growth in the last decade; more or less content with basic amenities with 2-3 meals irrespective of seasons or crisis, can save from income, occasional dependence on economic safety nets; usually depend on family labor or can engage seasonal fishing labor; annual familial income around Taka 60,000 (US\$ 923); repair or improve house after 2-3 years; better family literacy.	Have medium to large boat for fishing; sub-leased beels from original leaseholders; locally connected with different offices and NGOs; rising family and no economic crisis in the last 5 years; no scarcity of basic amenities; at least one remittance earner among kinship though not family; arable land of < 1acre; supplementary income from duck and cow ranching; good housing and ability to repair as needed; annual familial income around Taka 80,000 (US\$ 1230) or more; better family literacy.
Poor/ usually poor/ cyclically poor/seasonal poor ( <i>Gorib, dukhi, sombolhin</i> )	0-1 old net, no or usually old non-mechanized small boat; no arable land except homesteads or even no homestead land; very poor housing with polythene/ thatch/ bamboo; engaged as laborer in other's boat; usually one or half meal or even starvation during crisis; annual familial income less than Taka 25,000 (US\$ 385); always in debt; presence of sick/handicapped/traumatized member; one or more 18+ girls waiting for marriage, fail to repair houses as needed. Lives and dies in debt; poor family literacy; absolute dependence on labor sale.	Small boat; little arable land of 5-20 decimals; bad housing with thatched roof and jute-stick walls; almost absolute dependence on fishing and gathering from <i>haor</i> ; no remittance earner in the family or kinships; girls waiting for marriage; usually two meals in crisis period but hardly starves; poor family literacy; depend largely on labor sale.
Extremely poor/ ultra poor ( <i>hotodoridro, khub gorib</i> )	Have almost nothing to claim or sell; no boat or costly gear at all, might have a few traps or push nets; poor physical condition; sick or handicapped family member (s); no regular earner or access to regular income; one or more girls waiting for marriage; poor housing conditions and inability to repair house; always eat less than two meals a day; mostly dependent on economic safety nets; annual familial income <Taka 10,000 (US\$ 154) in perpetual debt; functionally landless. Born, lives and dies in debt, poor health status.	May or may not have small boat for transportation; a few traps or cast net for seasonal fishing; no arable land except homesteads; annual familial income around Taka 12,000-20,000 (US\$ 185-300); depends on <i>haor</i> resources; one or more girls waiting for marriage; poor housing conditions with thatch/ jute stick/polythene sheet; lives and dies in debt; poor family literacy; poor health status.
Destitute/ helpless ( <i>Dustho, nisho, oshohay/ vikuk</i> )	Absolutely landless; hardly any income; depends mostly on economic safety nets or other's mercy for food, clothes and shelter; sick or physically handicapped in many cases; long queue of girls waiting for marriage; born, lives and dies in debt; only thinking about a meal; declared inability to pay debt, broken health status.	Physically sick or handicapped; hardly any access to resources or any regular source of income; depends mostly on others for meal(s) and other amenities. Born, lives and dies in debt; broken health status.

<sup>5</sup> These usually include cows, buffalo, goats, pigeons, poultry animals, coconuts, trees etc. that can be sold in the time of crisis. Usually rural women tend to take care of such household properties.

**Etic view of livelihood:** To analyze and understand livelihood aspects, it is necessary to define livelihood first.

*'A livelihood comprises the assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) that together determine the living gained by the individual or household' (Ellis 2000: 10, emphasis mine); a livelihood is sustainable which can cope with and recover from shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation' (Chambers and Conway 1992: 7).*

A sustainable and vibrant livelihood system enables people to pursue robust livelihood strategies that provide, in effect, 'layers of resilience' to overcome 'waves of adversity', consequently enabling people to deal with and adapt to changes, and even transform multiple adversities into opportunities (Glavovic et al. 2002, *cited in* Glavovic and Boonzaier 2007). Contemporary literature covers diverse aspects of livelihoods at the household and community level. The sustainable livelihoods analysis, as a relatively new concept to the family of development approaches, goes far beyond the constricted economic ideas of employment and income, and attempts to bring multi-dimensional issues and complexities centering around the ways of living to the focus of attention.

Sustainable Livelihoods (SL) literature (Sen 1981, Chambers 1983, 1987; Chambers and Conway 1992, Scoones 1998, Singh and Laurence 1998, Bebbington 1999, Ellis 2000) induces us to conceptualize issues revolving around poverty and livelihood dynamics through the 'lens of the poor' for an enhanced resource productivity, and secure ownership of and access to assets. Most of the SL approaches evolved in the mid-nineties (World Bank in early 1990s, OXFAM in 1993, CARE in 1994, UNDP in 1995, DFID and FAO in 1998, EC and EFAD in 2001, compiled from the websites of the organizations) from their primary sectoral focus. There are ambiguities in the understanding and interpretation of the notions of sustainability and ways of community development/empowerment, mainly due to the objectives and interest of the agencies. Livelihood systems entail sets of complex economic, social and physical strategies. However, all the contemporary SL frameworks put significant focus on multiple capitals, human capabilities, multi-level links and flexibility in development actions.

SLs are achieved through developing peoples' capacity and competence to exercise choice, access resources, and use them sensibly for livelihoods in ways that do not

negatively impact on the options for others to make their living at present or in the future. Sustainability has much to do with social equity; the relationship is linear. Helmore and Singh (2001: 7) comment:

*'To be sustainable, livelihoods must adhere to the precepts of social equity; that is the way one household or community makes its livelihood must not disrupt options for others to make theirs. Whenever possible, one form of livelihood should enhance other livelihoods, as in relationship of trades, exchange, and services...however, countless exploitative relationships throughout the world, where the livelihoods of one group- from moneylenders and middlemen to landowners, industrialists, and other employers- are often based on practices that restrict, hamper, or threaten the livelihoods of others'.*

There are important relationships between employment, well-being, capabilities, adaptation, vulnerability and resilience which deserve further exploration. The notions of 'well-being' (Chambers 1995, 1997a) and 'capabilities' (Sen 1984, 1987) provide a wider philosophical dimension along with other concurrent development issues like common people's participation in the decision-making process, capacity building, gender mainstreaming, adaptive strategies, good governance and policy reform. Sen (1990) sees capabilities as *'what people can do or be with their entitlements'*, a concept surpassing material concerns of food intake or income that allows people to do things.

The concept of vulnerability recently emerged as a powerful analytical tool for unfolding states of susceptibility to negative attributes like harm, powerlessness, and marginality emanating from both physical and social systems. Entitlement-based explanations of vulnerability focused almost exclusively on the well-being and social realms of institutions such as class, social hierarchy and gender as important variables. Vulnerability research aims to build on integral knowledge of environmental risks and the associated human responses with focus on geographical and psychological perspectives in addition to the embedded social parameters of risks (Adger 2006: 268-270). The human ecology traditions attempted to explain the reasons for which the poor, especially in the developing countries, are the most at risk of natural hazards (Hewitt 1997, Haque 1997).

According to Carney (2002, *cited in* Glavovic and Boonzaier 2007), the SL approach has some normative ideals: it is people-centered, holistic, multi-level, flexible, responsive, participatory, and empowering as it provides serious considerations to the needs and well-being of the poor; it is predicated on sustainability, and takes an enduring

vision. It is the primary responsibility of the government to follow an appropriate political discourse for creating an enabling environment for the poor and guide its institutions towards the materialization of the SL concept (Chambers and Conway 1992). The policies and regulations need to be directed in a pro-poor way that ensures the poorest communities are not discriminated against, but instead are socially prioritized when it comes to appropriating assets. SL, being a holistic approach, demands the exercise of cross-scale negotiation with a variety of stakeholders as fundamental to any intervention process (Scoones 1998). There is the criticism that SL ignores long-term spatial dimensions, and hence, the construction of a livelihood has to be seen as an ongoing process in which the dynamic nature of the elements is captured over time and space (Ellis 2000: 10).

As we focus on the literature available on the livelihood of fishers, especially of Asia and Africa, we see that poverty equates with artisanal fishers. I mentioned this briefly in Chapter One of this thesis. Drawing on contemporary literature, Bene (2003) aptly mentions there is a belief that the debate on livelihoods in artisanal fishery has been reduced to an almost universally accepted perception- '*fisheries rhymes with poverty*'. Two dominant paradigms are obvious for the analysis of poverty in the small-scale fisheries: 1. the 'old paradigm' with the perception that poverty in the fisheries is largely influenced by natural factors (fishing resource, level of exploitation, aquatic ecosystem functions, etc.), and 2. the socio-political, economic and institutional dimensions of fisheries including rules and regulations (formal and informal) governing access to and exploitation of fisheries resources (Bene 2003). Going beyond the Malthusian perception of poverty, he argued that the cross-scale socio-institutional dynamics play important roles in the 'maintenance, alleviation or aggravation of poverty' among the small-scale fishing communities (*Ibid*: 950). Supportive of the latter view, FAO (2000) states that poverty in the artisanal fisheries is likely to continue so long poverty exists in the country.

### *3.2. Sustainable livelihood (SL) analytical framework for artisanal fishers*

Going beyond the mere economic view of poverty analysis objectively in terms of income, expenditure and some other quantitatively defined indicators, the SL framework as a new development lexicon, seeks to understand and analyze the livelihoods of the poor through the lens of the poor and then undertake appropriate poverty reduction strategies (DFID 2000). The participatory research methods offer the best means for assessing poverty and capturing what people themselves identify as its principle dimensions, indicators and ways of exit (Chambers 1981, 1994b, 1994c; Chambers and Conway 1992, Ellis 2000).

The SL analytical framework has some inherent notions: 1. people have resources (endowments or capital) which they use to make a livelihood, 2. the resources are not homogeneously distributed across members of the society and hence, there are intrinsic competitions over access to and control over those resources; 3. one's capability to transform multiple resources for livelihood goods and services determines one's livelihood resilience and status in the society; 4. people are subject to a process of interaction among different social actors, and there are obvious influences of policies and multi-layer institutions in determining one's property rights and well-being; and 5. households are subject to multiple sources of man-made and natural negative externalities that impact upon well-being and ill-being (Chambers and Conway 1992, DFID 2000, Clark and Carney 2008).

The SL analytical framework (Figure 3.1) organizes ideas under some manageable categories linked through critical processes and dynamic interactions. These approaches are built on people's capabilities of responses in unfavorable situations with whatever endowments they have, rather than the narrow view of measuring what they lack. All the frameworks formulated so far (e.g., Scoones 1998, Bebbington 1999, Reardon and Vosti 1995, Moser 1996, DFID 2000, 2008; Clark and Carney 2008, Ellis 2000) examine the competition for and translation of limited assets into a workable livelihood strategy influenced by sets of external factors. Such a framework can be applied to a multi-scale layer, ranging from as narrow as households to higher entities. The contemporary SL frameworks tend to put equal emphasis on multiple assets, and such a generalization of

the application of capital is problematic for a professional group like fishers who depend largely on the availability of and access to natural resources.

The question arises here: do contemporary SL frameworks fit well for the analysis of livelihoods and poverty of artisanal fishers? It is observed that small-scale fishers as a professional group are almost solely dependent on access to and availability of natural resources like fish, shrimp and crabs (see Table 5.11 and 6.12 for details). For obvious reasons, an imbalance or disequilibrium status in fisheries resources and ecosystem may have direct and severe consequences on the livelihoods of fishers. That is why I put natural capital at the centre of other capitals which singly or together may influence the natural resource base (Figure 3.1). Contemporary SL frameworks also do not give due considerations to political and cultural capitals, which I consider significant in determining one's rights and capabilities, and shaping the world-view associated with fishing operations. Gravitating around Sen's entitlement approach and contemporary frameworks of livelihood, I modified the SL framework to make it specifically applicable to the rural artisanal fishers. The basics of Sen's entitlement approach are synthesized here to lay the ground for understanding livelihood dynamism of fishers.

Amartya Sen in his groundbreaking 'Poverty and Famines: An Essay on Entitlement and Deprivation' theorizes:

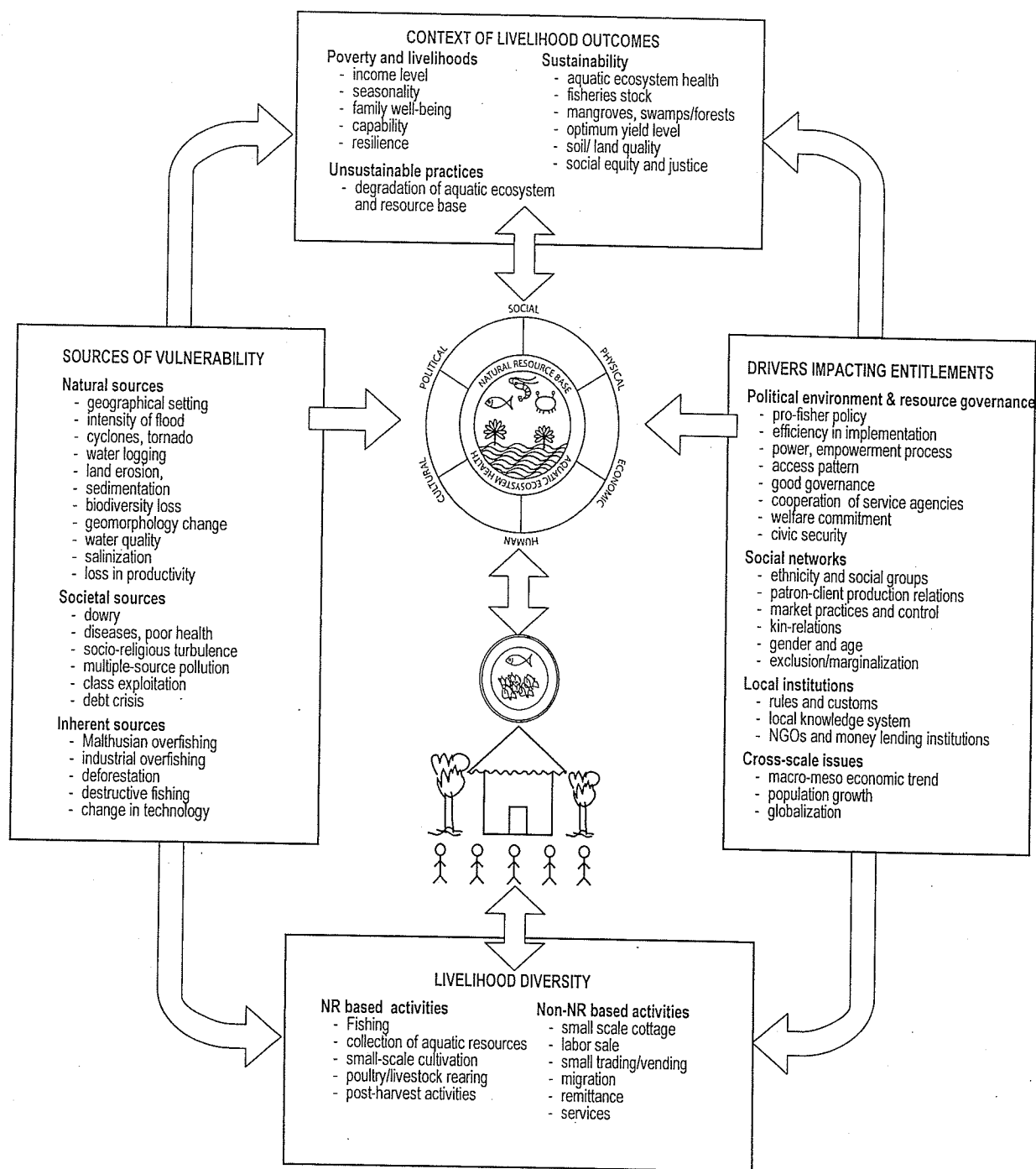
*'A person starves either because he does not have the ability to command enough food, or because he does not use his ability to avoid starvation; ... a person is reduced to starvation if some change occurs either in his endowment (e.g., alienation of land, loss of labor power, ill health) or in his exchange entitlement (e.g., fall in wages, rise in food prices, loss of employment, drop in price of foods he produces)'* (Sen 1981:45).

Sen's fundamental propositions are: 'there is indeed absolute poverty, seen at its starkest in famines, and we nonetheless need a socially disaggregated view of poverty, and must distinguish different groups in terms of their degree of poverty and the security of their access to basic necessities' (Gasper 1993: 681). Sen's entitlement approach is instituted on three basic conceptual categories: the endowment set, entitlement set and entitlement mapping. An individual's or household's endowment set is the blend of all legally-owned tangible and intangible resources that may be transformed into food and commodities through production and trade, while the entitlements constitute all the possible combinations of goods and services that a person can legally obtain by using the

endowment sets in a society, using the totality of rights and opportunities (Sen 1984). Entitlement mapping is the 'relationship between the endowment set and entitlement set', i.e., the input-output ratio in the farm production system, and the actual wage rate as a function of wages and the price of food (Osmani 1995). The entitlement mapping thus reflects the rules, conditions and processes which affect how one's entitlements are derived from one's endowments. Extending beyond legal rights and obligations, the use of public goods and other social rights and obligations are referred to as 'extended entitlements' (Dreze and Sen 1989: 10, *cited in* Gasper 1993: 683).

Sen's interpretations of differential entitlements mirror that individuals belong to certain social classes predisposed to differential means of livelihood, and hence, the exchange entitlement is reflective of one's position in the economic class structure and modes of production (Sen 1981). The concept of entitlement holds the fact that food insecurity and persistent hunger is an indicator of livelihood ill-being or very low livelihood resilience of the poor who lack the requisite capacity either to produce sufficient food themselves or the financial ability needed to purchase food in a sustained manner, although food might be available in the market (Sen 1981, 1984; WCED 1987).

Approaching the concept of entitlement, livelihood can be viewed as strategies employed by households to sustain the well-being of members up to a socio-culturally determined livelihood standard through banding together multiple forms of entitlements. A household may have access to different sources of entitlements, the amount and degree of which together determine well-being and ill-being. In this interpretation, those households are vulnerable that fail to comply with culturally determined minimal needs over the annual cycle. For labor-dependent communities, Sen (1981, 1984) views health and nutritional status both as an input to the process of impoverishment and a product of poverty. Sen's capability approach is value-laden from human rights point of view. It well-places the issues of gender disparity that women suffer, for example: discrimination in accessing resources and opportunities, educational deprivations, the rejection of recognition of productive roles of women, humiliation and frequent insults to bodily integrity (Nussbaum 2006).



**Figure 3.1: A framework for analysis of livelihood dynamics of fishers (modified from Ellis 2000, Scoones 1998) using the entitlement approach of Sen (1981, 1984, 1999)**

Apart from natural calamities, vulnerabilities may emanate from human-induced or social dimensions which are sustained through social obligations such as dowry,

weddings and funerals. Household's adaptation renders positive when it is by choice and adds positively towards livelihood security; it is negative if it is by inevitability and fails to deal with vulnerability (Ellis 1998). Further concepts that are useful in refining the concept of vulnerability are those of resilience and sensitivity, which originate in agro-ecology and natural resource management literature (Ellis 2000; Berkes et al. 2005, Berkes 2007). Most rural livelihoods are more or less dependent on the sustainability of the natural resource base. The seasonality of a resource base is an important determinant and inherent feature of rural livelihoods. It is now evident that some rural villagers find opportunities in other agricultural or informal low-skill sectors and undergo circular or permanent migration for income with their networks of friends and kin. This is just another way of saying that 'families usually don't put together all the eggs in a box' (Dercon and Krishnan 1996) to spread out risks.

The ability of a livelihood to be able to cope with and recover from stresses and shock is central to the theme of livelihood resilience. Those households not resilient enough to cope with short-term or long-term adversities eventually fail to make their livelihoods sustainable. Poor people are impacted grimly by shocks and stresses emanating from a host of external factors like markets, globalization, politics, law and order situations, and environmental changes, many of which are simply beyond the control of poor communities. For different categories of people, diverse types of shock in turn may result in different types of responses which include 'avoidance, repartitioning, resistance or tolerance mechanisms' (Payne et al. 1994: 15). Interestingly, the theories of capabilities and entitlements provide us insights into the concept of livelihood resilience: individuals or households with higher levels of entitlements are anticipated to hold higher levels of livelihood resilience. In the ecological literature, resilience is viewed as an emergent property of a system that exhibits the capacity to deal with shocks and stresses, capability of self-organization, and the ability of learning and adapting (Holling 1978, Holling et al. 1998, Resilience Alliance 2007, Berkes 2007). All these salient features of resilience thinking make it well-connected to the theory of complex adaptive systems (Holling 2001, 2004; *cited in* Berkes 2007: 286).

The resilience of the aquatic ecosystems on which fishers primarily depend for their livelihood has much to do with livelihood security. A family or community is

logically expected to be livelihood resilient so long as the ecosystem and resources nurtured therein remain in a maximum sustainable level on a long-term basis. Built on this argument, a linear relationship between fishers' livelihood resilience and the sustainable use of fisheries resources can be put forward (again this has much to do with management policies, collective actions of communities, and so on). Gibbs (2009: 324) argues that resilience thinking focuses holistically on the behavior of a system whether it be a large marine ecosystem or a coastal community as resource users, and this is in 'contrast to many classical natural resource management approaches that hold a reductionist view' (e.g., single-species fishery management). The resilience of both biophysical and socio-economic systems is inherently a social issue given the dominant presence of humans for obtaining goods and services (*Ibid*: 330).

In social-ecological systems, change is the rule and so are the conditions of one's endowments, entitlements, and on the whole livelihood systems that are amenable to several endogenous and exogenous drivers. If the concept of resilience is transformed into a livelihood system, then it can be viewed as the capacity of individuals (or higher scales) to tolerate shocks and stresses without compromising livelihood status, and devising strategies for adaptive management and retaining memory through learning-by-doing (Resilience Alliance 2007, Berkes 2007). Conceptually, SL, livelihood well-being and livelihood resilience are interconnected and complementary concepts to our understanding of livelihoods.

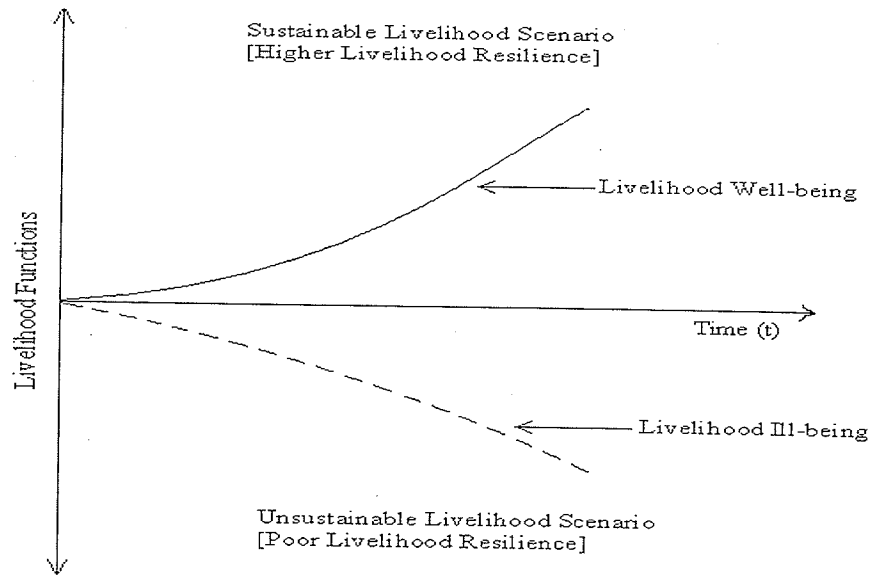
The SL framework strongly speculates that people and their assets are subject to multifarious shocks and stresses, and it is equally important to examine how people respond strategically to offset the negative externalities. A positive situation (livelihood well-being) prevails when people using their sets of capabilities and endowments can come back to their normal path of livelihood, while a negative situation (livelihood ill-being) characterized by unsustainable or poorly resilient livelihood prevails as people fail to get back to normalcy over a period of time. This notion of 'time' is an important determinant here. Hypothetically, it tends to be infinite for the sustainable and resilient livelihoods, and moves towards zero in cases when negative situations prevail or dominate.

$L = f(t, c, s_i)$  (where  $L$  = livelihood function,  $t$  = time,  $c$  = capital or endowment sets, and  $s_i$  indicate multiple stress factors)

$L(\Delta t) > 0$  or  $\Delta t(L > 0) \rightarrow \infty$  (a positive situation of sustainable, resilient livelihoods with symptoms of well-being)

$L(\Delta t) \leq 0$  or  $\Delta t(L > 0) \rightarrow 0$  (a negative situation of unsustainable or poorly resilient livelihoods with symptoms of ill-being)

Households rely substantially on their sets of capital to address waves of adversities, and hence, depending on the level of exposure to favorable and unfavorable times, a household's assets can be enhanced, eroded or even totally wiped out by natural calamities. In the case of a resilient livelihood, 'the quantity, quality and mix of assets are such that adverse events can be withstood without compromising future survival and this requires flexibility and substitutability between assets' (Ellis 2000: 45).



**Figure 3.2: Diagrammatic presentation of livelihood resilience**

Household livelihood strategies (HLS) usually bring into play an image of collective behavior where members of households, as part of their parental or marital obligations and emotional attachments for providing necessary amenities, contribute differentially in their complex and multi-faceted areas of income, expenditure, power, influence and decision-making processes, as culturally appropriate for their age and gender. Davidson (1991) argues that HLS in effect produce and reinstate wider social

relations such as class and gender, and as such, societal opportunities and constraints manifest variations through the particular structural position of the household. In the fishing villages, these household strategies are neither uniform nor static: rather the HLS (conscious or subconscious, tacit or deliberate) change over time to become more competitive and effective in dealing with the numerous external stressors. In fact, in analyzing HLS *'we begin to visualize households as groups in which there is a high density of activity'* (Wilk and McNetting 1984, *cited in* Davidson 1991: 22).

Livelihood diversification is extremely important for the fishers who are often considered not suitable for jobs other than manual and fishing-related activities. Diversification supports households to insulate themselves from multiple environmental and economic shocks, and access to the fisheries resources remains critical for such communities, sometimes even more so as a result of vulnerability (Bauman 2002). Again the job opportunities for this category of 'mono-skill' professional groups are intricately related to the overall health of the macro-economy, political stability, good governance, and human capital in terms of risk-taking attitude, experience and developing new sets of skills. I provide a separate analytical treatment on livelihood diversification of fishers in section 6.4 of Chapter Six. Several empirical studies demonstrate that moving out of poverty is a slow and cumulative process, often achieved through minute increments. Assets are scaled up gradually quantitatively and qualitatively: for example, from small-scale enterprises of chickens to goats, to cattle, to land or livestock (Ellis and Mdoe 2003, *cited in* Ellis and Allison 2004).

It is argued that conceptualizing capital or assets into the framework tends to reduce them to some forms of neoclassical economic concepts and is actually an effort to *'capitalize'* every aspect of people's lives (Beall 2002, *cited in* Toner 2003). There are some cross-cutting issues which may be analyzed using different lenses. Creating a distinct boundary, especially for human, social, cultural and political capitals appears difficult and hence, some forms of overlapping among these capitals are logically expected. In the rural context, access to multiple sources of capital not only helps people to make a living commendably, but also adds importance to the person's world, encompassing one's capability, moral strength, dignity, sustainability of living, empowerment process, and the ability to challenge or change institutional aspects. All the

capitals mentioned in the framework have a distinct role and significance, although some scholars put more emphasis on human capital<sup>6</sup>. Sen (1997) notes the possession of human capital not only means people produce more and more efficiently, it also gives them the *capability*<sup>7</sup> to engage them more *fruitfully and meaningfully* with the world, and most importantly, the capability to *change* the world. Another school of thought (Putnam 1993, 2004) puts the emphasis on the functioning of social capital, which is not always tangible and therefore difficult to understand and assess.

Scholars differ in their views about political capital. Baumann and Subir (2001) suggest that political capital should be given equal status with other capital assets, but Toner (2003) argues that a sound definition of social capital would necessarily include a consideration of power and political relationships. However, there is no denying that rural livelihoods have become ever more politicized and heavily impacted by cross-scale institutions. Some scholars, demonstrating a rights-based approach, argue that it is the differences in the holding of political power within a given society that may be held responsible for food and livelihood insecurity (De Waal 1989, Keen 1994, *cited in* Yaro 2004). Without a clear understanding of the political capital, elucidating ideas about political economy and political ecology would also become difficult at the micro-level. Most of the SL frameworks give poor treatment to power and politics, and one recommended solution is to incorporate 'political capital' into the SL framework (Baumann 2002: 31), so the political negotiations and underlying processes of the rights and access to natural resources become understandable to us. An understanding of the locally situated political capital is thus helpful in designing appropriate development interventions, including the risks associated with the process. This is especially true in the case of artisanal fishers.

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<sup>6</sup> Sen's capability expansion far exceeds in merit the concept of human capital. The former focuses on the ability of human beings to lead lives they have reason to value and to enhance the substantive choices they have, while the latter concentrates on the agency of human beings- through skill and knowledge as well as effort- in augmenting production possibilities (Sen 2003: 35).

<sup>7</sup> Extending Sen's capability approach, Nussbaum (2006: 58-59) provides a list of 10 central human capabilities: 1. life, 2. bodily health, 3. bodily integrity, 4. senses, imagination and thoughts, 5. emotions, 6. practical reason, 7. affiliation, 8. other species (world of nature), 9. play, and 10. political and material control over one's environment.

In the same way, considering the immense significance of the different aspects of socially-embedded culture, I added 'cultural capital' as an endogenous variable. Of all the known capitals, cultural capital is probably the most shared and homogenously distributed among the community members. Social psychologist Lewin (1947) succinctly captured the idea that *'individuals not only think, feel, and see things from a personal perspective, but also from the standpoint of the group of which they are a part'* (Lewin 1947: cited in Bar-Tal 1989: 2). The notion of cultural capital considers the fact that 'individuals who live in groups hold common beliefs which define their reality, not only as persons, but also as group members. This reality becomes especially important when group members become aware that they share it' (Bar-Tal 1989:1). Fishing communities, as distinct social groups, acquire and store such group beliefs which are manifest partly through the observance of bountiful rituals.

The contemporary SL frameworks show positive tone towards livelihood outcomes (like livelihood well-being, better ecosystem health, social equity and justice). It is argued that such a generalization is difficult, and livelihood outcomes might not be necessarily positive, especially in case of the marginalized section of society. Under negative externalities like ecosystem health degradation, macro-and-microeconomic instability, lack of good governance, and antagonistic roles of the formal institutions, livelihood outcomes of the poor would inevitably become 'brittle'.

Overall, this chapter lays out the analytical foundation for the present research. The SL framework can be viewed as an integrated, people-centered holistic approach that portrays what people do to make a living with the endowments they have command over, subject to positive and negative influences stemming from cross-scale political, institutional, economic, environmental and social arenas. It focuses more on people's strengths, abilities and capabilities than on their weaknesses. Given the dynamic, complex and heterogeneous nature of a community, livelihoods also revolve as dynamic, flexible, diverse and adaptive in both time and space as outcomes of responses to numerous conflicts. The livelihood framework that I propose for fishers (Figure 3.1) emphasizes their access to and control over the natural resources, and their inherent abilities, knowledge, and creativity to construct and shape the world around them. Based on the extension of Sen's entitlement approach, the idea I defend here is that it is difficult to

draw simple linear relationship between the growth of population, availability of fisheries resources, production from the aquatic ecosystems and poverty in the fishing villages (Bene 2003: 959). The socio-political mechanisms within and outside fishing villages have tremendous influence over the access, control and redistribution of the benefits derived from natural resources.

Complementary to the conceptual analysis in this chapter, the next chapter will introduce a distinct analytical domain 'fishantry' for the fishers from various viewpoints. It also introduces the ecological and social setting of the study villages with special focus on the embedded institutions and gender relations.

## Chapter Four: The Distinct Characteristics and Institutions of the Fishing Communities

### 4.1. Introduction

*'You have definitely experienced floods. During the floods, you will see that the small creature 'ants' form 'small balls' that roll on the flood waters. Within the ball, ants keep changing their positions so that none is drowned in the water; they keep floating and surviving. On the other hand, big animals like cows and goats die as they can't form a group. For survival in this complex world, the poor fishers have to roll like ants. Only fishers know what a fisher's life is about.'* Horimoni Jaladas, 55, Thakurtala, Moheskhali.

*'There are crocodiles in the water, tigers in the jungle and moneylenders in and around the fishing villages; all these creatures wait for chances to devour.'* Radhakanta Jaladas, 47, Thakurtala fishing village, Moheskhali.

Horimoni's realization about 'keeping together like the ants' and Radhakanta's understanding about intimidating creatures are significant. The connotation is that fishers live in a hostile world, and the moment they go outside the fishing village, they are subject to some form of subjugation, humiliation or exploitation. Staying together with a strong sense of community feeling is rooted in the social institutions, they share and maintain. For peasants, Shanin (1990: 51) comments that '*peasants are a mystification*'; the same reality applies to fishers also. Some of the mystical features of the socio-cultural aspects of fishers will be apparent in Chapters 4, 5 and 6. For instance, the observances of pre-voyage rituals and the mental mapping of celestial navigations are quite unique to the coastal fishers. It is difficult to understand fishing communities and their livelihoods without a thorough understanding of the socio-cultural setting they live in, the institutions they interact with, and the ecosystems they depend on for their livelihoods. The fishers of these two villages see the world differently through their individual behavioral lenses and socio-cultural constructions which are impacted heavily by their immediate environment and livelihoods.

From my empirical observations and decade-long work experience with the fishers, I realized that many aspects of the fishers as a social and occupational group do not correspondingly fit well with those of peasants. This chapter argues there are reasons to treat fishers as a distinct social entity, and such distinctiveness made me realize the need for a conceptual innovation. Accordingly, a new analytical field for small-scale fishers is put forward. This chapter introduces the two study villages; it provides a

comprehensive account of the social institutions of the villages and the social hierarchies therein as an inherent product of caste identity and social groupings. The idea is that the fishantry cannot be understood well without a comprehensive understanding of the general social and ecological settings. It is also argued that fishing women, unlike other rural women, play distinct roles in the critical circuits of the family economy and in maintaining the traditions of small-scale fishing.

#### 4.2. Fishantry

*'A fisherman is a fisherman; fish in our thoughts; fish in our dreams; fishy smell comes from our skin; fish is in our every discussion... we are gambling for fish throughout life; we are crazy for fishes. Everything in fishing and fishing villages is peculiar.'* Sitaram Jaladas, 56, Thakurtala.

While exploring some literature on peasantry, I noticed that the fishers' ideas about nature, their social relations of production and their livelihoods have been neglected in the vast and growing scholarship on peasantry in the colonial, post-colonial and even recent periods. Trying to find a conceptual framework suitable for fishers provided me with a methodological turning point in this research. Bene (2003), from the analysis of a World Development Report *'Attacking Poverty'* (2000-01), showed that the keyword 'fish' (to include fish, fishers, fishing, fishermen, fisherwomen, etc.) appeared only three times in 266 pages, and there was only one case study of fishers out of the 35 cases on common property resource issues. Historically, fishers have been widely overlooked and many anthropologists relegated or leveled off different rural producers like fishers under the general category of peasants<sup>1</sup>. However, field-level realities tend to disprove the generalized positions of many scholars who worked on peasantry. The very word 'peasant' tends to exclude fishers from its self-determined domain. Eric Wolf's characterization of peasants depicts this reality: peasants are the *'populations that are existentially involved in cultivation and make autonomous decisions regarding the processes of cultivation ... This category... does not, however, include fisherman [emphasis mine] or landless laborers'* (Wolf 1969: xiv).

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<sup>1</sup> There are very few studies on rural communities including peasants and fishers in the pre-independence period of the Indian subcontinent (i.e., pre-1947). Gurumurthy (1982) claims that during the colonial period, many contributions by British scholars (Main 1870, Bedan-Powell 1896, Griorson 1926, Wiser 1930 in Gurumurthy 1982) aimed towards knowing the natives to administer them better with the least amount of expenditure and disturbance, so the exploitation of natural resources by the colonial power were not disrupted.

In the rural areas, there are other non-farming professional groups with distinctions in their professions who contribute significantly to the local production systems. Without these supplementary sectors, a purely terrestrial agricultural system would have stagnated and failed to address the multiple needs of societies. Along with farmers as producers of rice, fishers also deserve identical attention as suppliers of fish that together make the well-known 'rice-fish' dietary habits of the Bengali community. The importance of small-scale fisheries in terms of employment generation and supply of animal protein has been mentioned in section 1.1 of Chapter One.

In the literature, peasantry has transformed as 'more than a piece of intellectual nostalgia' (Shanin 1990: 21) and there are many ways peasantry is understood by scholars. It is widely viewed as a distinct class, concept and social process, yet it is difficult to capture all notions of peasantry by a single concept. The large diversity within the category of peasantry in different regions and most rural communities seems to militate against the notion of generalization (Shanin 1987). Redfield (1956:18) effectively captures the dilemma on the internal heterogeneity of the peasantry as a group and the fluidity of the concept: '*peasantry as a type is not as distinct as birds are from mammals, or colloids from crystals*'. Scholars have viewed peasantry using different analytical lenses: as a societal group and way of living (Wolf 1966, Tung 1946, Redfield 1956, Saul and Woods 1987); an economy (Galeski 1968, Dumont 1957, Alavi 1987, Rahaman 1987, Harriss 1987); a culture (Dobrowolski 1987, Berger 1987, Bailey 1966, Scott 1976, Ortiz 1987), and class (Marx 1950, Hobsbawm 1959, Tilley 1982, Scott 1985, Alavi 1973, Shanin 1987, Wolf 1965) (compiled from Shanin 1987). Some essential features of peasantry are: peasant families are the basic units of social organization; land husbandry practices are the key means of livelihoods; specific cultural patterns are linked to the ways of life; and peasants usually have the 'underdog' position in society (*Ibid*: 3-4).

As an economic and social group, there are some similarities between the peasants and fishers of Bangladesh and elsewhere in Southeast Asia. Both depend considerably on manual labor, and have their own indigenous sets of knowledge appropriate to their immediate ecosystems and profession. Both the professional communities are subject to the increased forces of globalization (Pers. Comm. J. Buckland, Sept. 2009). Point is: if a peasant's entity can be conceptually framed by the term 'peasantry', then fishers as

another age-old professional group similarly deserve to be designated with a separate concept, which I intend to label as 'fishantry'. For describing the 'peasant economy' aspects of the Malay fishers, Firth (1966) acknowledges that the economy of a fishing community has some special features arising from its specific technical conditions, although it shares many of the general characteristics of an agriculture economy. Pi-Sunyer (1977: 43), for describing the Catalan fishermen-farmer community (Gerona, Spain), mentioned: *'given these attitude to farming and fishing, the close linkage between the two occupations, and an economic strategy based on a balanced exploitation of land and sea, it seems reasonable to approach the fisherman...as basically a variant of Catalan peasantry'*. Later, in response to the criticism of the 'anthropological ploy' of treating fishermen as a sub-type of peasantry, he mentioned about the intension of a particular adaptation in transition (Pi-Sunyer 1987: 377). Mintz (1973) argues for developing typologies for different rural socio-economic groupings rather than abstract definitions of peasantry.

For peasantry, Shanin (1990: 71) argues that *'no concept should be retired simply on the grounds of its representing only some aspects of reality. Every concept is systematically selective, and therefore carries necessary blinds and limitations...No concept should be retired on purely deductive and/or logical grounds without a thorough investigation of the insights into reality...'* These propositions are supportive of laying the foundation for the new concept of 'fishantry' that appears to fit well for fishers as a distinct professional community and fishing as a profession. I will elaborate on some distinct aspects for justification of the fishantry. Shanin's (1990) conceptualization of parallel realities of peasantry can be considered and rephrased for approaching fishantry (Table- 4.1). Some typical attributes (worldview and social, economical, technological and ritual features) prevalent in both peasant and fishing communities are considered here.

**Hypothesis 1: No distinctiveness:** To assume that fishers do not possess a remarkably different set of related characteristics, thus leaving no scope for applying a separate analytical treatment, conceptual significance and theoretical justifications concerning their aspects.

**Hypothesis 2: Distinct but not significant enough:** To assume that fishers differ consistently from non-fishers in ways which are socially significant, but the set of particularities can and should be fully explicated within the existing school of thoughts on peasantry by extending its application, and

**Hypothesis 3: Distinctive and significant characteristics:** To acknowledge that fishers possess distinct characteristics compared to non-fishers, and hence there is a critical need for conceptual innovation and treatment.

**Table 4.1: Analytical justifications for fishantry**

Characteristics	Hypothesis-1	Hypothesis-2	Hypothesis-3	Remarks
Worldview	No	Yes	Yes	<i>Some variations might be observed between fishers representing different geographical areas and ecosystems.</i>
Social attributes	No	Yes/No	Yes	
Cultural attributes	No	Yes/No	Yes	
Economic attributes	No	Yes/No	Yes	
Technological attributes	No	Yes	Yes	
Ceremonial/ritual attributes	No	Yes/No	Yes	
Theoretical distinctiveness	No	No	Yes	

*Source: Modified from Shanin (1990)*

Based on practical situations and empirical knowledge, this study pursues the idea that fishantry as a social and occupational group possesses distinct characteristics relative to peasantry. One simple reality is that fishers have survived for generations based on their fishing and fisheries- related activities. It is argued that fishers' way of life is not the same as that of peasants, and that fishers represent a unique social-economic-cultural domain within broader society. Table 4.2 provides the salient features of commonalities and differences between peasantry and fishantry in the context of Bangladesh.

Despite some similarities in the labor-intensive mode of production, seasonality and dependence on a natural resource base, the fundamental line of difference lies on the issue of ownership over the means of production. Peasantry (at least a certain portion) has legal entitlement over certain areas of land, whereas fishantry mostly depend on common property resources that are usually legally regulated by state agencies. This fundamental difference in the pattern of ownership over important means of production largely dictates the production relations and the sharing of associated benefits generated from the economic system. Most of the activities of peasants are land-oriented, while those of fishers are centred on different waterbodies ranging from wetlands to littoral zones to the

deep sea, although some activities like organization, processing, transportation and marketing are land-based. The resource management systems are different, and there are different degrees of risks and uncertainties involved in both professions. Between the peasantry and fishantry, there are also distinct differences in harvest and post-harvest technologies, types of the produce, social and economic organizations of the production systems, gender aspects in labor distribution, frequency and types of rituals, political consciousness and level of interactions with the wider society (Table 4.2).

Fishantry as an occupational category itself is likely to encompass extensive divergence and intricacies. It is anticipated to cover the intricate production relations prevailing within and outside communities, unpredictable complexities that exist in the resource management system and the behavior of the aquatic ecosystems and resources therein, and on the whole, the sets of complex behavior of how the fishers respond to these compounded complexities for their livelihoods. There are horizontal sub-groups with wide variations in ethnicity, technology used, capital endowment, production economics and power control. Fishers, because of their distinct socio-cultural adaptations and relationships with their immediate aquatic environment, have a very rich and variegated socio-cultural traditions characterized by regions, religions and local cultures. For example, the hereditary Hindu fishers of the coastal areas celebrate the worship of the Goddess *Ganga* (the goddess of the sea) with utmost devotion, while the fishers belonging to the same religion in the floodplain area worship other goddesses that they deem more suited to their local culture.

A distinct interplay and trade-off between peasantry and fishantry tuned to the flood-pulse in the floodplain areas is apparent (see Table 6.3 for details); a small section in the fishing villages switch from agriculture to fishing or vice-versa. As we know existentially about the distinct characteristics of coastal and inland fishers relative to peasantry (see Table 4.2), hypothesis 3 of Table 4.1 can be considered most appropriate for approaching fishantry. *'Peasant society and culture has something generic about it; it is a kind of arrangement of humanity with some similarities all over the world'* (Redfield 1956: 25). Similarly, small-scale fishers in Bangladesh also have something in common with each other. These are: dependence on the natural resource base, conflict over control and access to productive fishing areas, the relative simplicity of crafts and gear of the

fishery, use of family labor, uncertainty of catch and sale, perpetual dependence on intermediaries, and a general prevalence of poverty.

Fishantry here is defined as a *social entity with distinct social-economic-political and cultural characteristics tuned to the complexities of small-scale fishery, who using simple equipment and mostly family labor capture fish and other aquatic organisms for household consumptions and sale for income, work as paid laborers and/or remain engaged as coerced laborers on share basis for serving the owners of production units*. I must reiterate here that fishantry as a professional entity is not a single or homogenous entity, but a complex dynamic mix of different sub-groups, forces, attitudes and responses within the apparently homogenous community. A study of the fishers transcending disciplinary boundaries with a focus on their social structure, economy, history, dynamics, culture and other factors can be put under a new area- 'fishantology', as similar to 'peasantology'- (Shanin 1990). Rather than viewing fishantry as an extension of fisheries science, it would be better to find its roots within the social science boundaries as fishantry is primarily concerned about what fishers are and what they do.

Indicative of the livelihood pluralism for incomes from multiple sources (see Table 6.12 for the types of professions and their relative importance), we see seasonal and even diurnal changes in occupations at the individual level. In some rural villages, a person can be a farmer in the morning with his cattle and plough, and a subsistence fisher in the evening with his cast net or other simple fishing gear. Thus there are subsistence, part-time and full-time occupational groups; there are both caste-based (Hindu fishers are 'organically, socially and culturally' defined fishers), and newly entrant social groups of Muslim fishers; and there is family level to large-scale labor involvement. There are also farmers-cum-fishers whose profession gravitates between farming and fishing as they produce both paddy and fish simultaneously or cyclically from the same area. There is mounting evidence of social subservience and widespread economic exploitation by the well-to-do and politically powerful class. Most fishers are very poor. These issues of exploitation and state of poverty are discussed and supported by evidence in section 6.2.6 of Chapter Six. There is a wide disparity in capital involvement and income among fishers and other stakeholders involved with the fishery.

**Table 4.2: Comparisons between peasantry and fishantry**

Issues	Peasantry	Fishantry
<b>Ownership over resources</b>	Usually owns certain areas of farming land; however there are marginal or landless farmers who depend on the land of others for sharecropping. The pattern of ownership over land largely determines the production relations and sharing of benefits. Occasionally, fallow lands ( <i>Khas jomi</i> ) are distributed among landless farmers by state agency.	Lack ownership or legal entitlement over the important means of production; usually harvest from the sea/coast that are common property resources and regulated by state agencies. However, in the floodplain, legal entitlement is bestowed for certain period through a competitive leasing process. Only a few fishers can enjoy such legal entitlement. Despite the <i>de facto</i> community-based territorial management of certain areas, higher level institutions can challenge such rights over territory.
<b>Seasonality</b>	Yield takes weeks to months from the time of sowing to harvesting; the growth of the produce is visible and can be estimated; the shelf-life of the produce is usually longer. Farmers usually have domestic facilities for storage. Crops are often subject to damage by flooding, drought, infestation and other natural calamities. Large producers are also subject to exploitation by intermediaries.	Harvest is often a regular activity on an hourly to daily basis; it is often uncertain and highly fluctuating; fish and prawns are highly perishable with a short shelf-life and hence require immediate treatment with ice after catch. Most of the small-scale fishers usually lack long-term preservation facilities; some convert the wet products into solar-dried or fermented products. This perishable aspect asks for the presence of a series of intermediaries. Fish breeding, growth and distribution are favored by flooding.
<b>Planning</b>	Requires mid-term to long-term planning for accumulation of land, seeds, irrigation, plowing, fertilizers, storage facilities and distribution.	Planning required for capital accumulation for repairing and purchasing crafts and gear, hiring of labor, access to certain fishing areas (in case of inland fishing) and marketing.
<b>Gender and hired labor</b>	Mostly male dominated, but women also participate directly or indirectly in several stages of planning, preparation, growing-out, harvesting, post-harvest activities, marketing and associated rituals. Depending on size of land, there is scope to engage hired laborer on cash or sharecropping basis. Tend to confine to kin relations.	Catching fish in the floodplain and coast/sea is predominantly a male pursuit; women participate in post-harvest activities, marketing, and preparation of the fishing equipment and associated rituals. Depending on size of boat, there is scope to engage hired laborer on cash or share basis. Fisherwomen are perceived to enjoy better mobility compared to women in peasant villages.
<b>Social and economic attributes</b>	Number of rituals relatively fewer ( <i>nabanna</i> -new rice is widely observed); peasants enjoy relatively better social hierarchy. Land has higher value owing to appreciation. Agricultural equipment undergoes depreciation. Both fishers and farmers participate in common rituals apart from their identical rituals.	Higher number of rituals observed as the perceived level of risk is very high. Both Hindu and Muslim professional fishers are socially neglected. Fishing equipment undergoes depreciation over years. Intermingling between fishers and farmers is common, but marriage is quite restricted to caste-based fishers (Hindu) and similar social groups (Muslim).

<b>Inter-dependence</b>	Both farmers and fishers form important parts of the wider rural economy. Farmers produce staple food-rice; they are relatively independent of the main foods needed on a daily basis. Farmers may turn to part-time fishing for subsistence and family consumption. The profession does not necessarily require geographical isolation and familial segregation. Both fishers and farmers substantially depend on kinship obligations for management of production.	Fishers produce cheaper bulk sources of protein for self-consumption and wider society; depend on agriculturists for rice as staple food item. Fishermen or their female counterparts can engage themselves for rice and vegetable production. Both farmers and fishers have their own sets of traditional knowledge base that are usually ecosystem specific and time-tested. The profession requires geographical isolation and familial segregation in most of the cases for days to several months.
<b>Technological attributes</b>	Still largely dependent on manual labor for most stages of production. Physical risks associated with agriculture are negligible or less; the profession is not life-threatening; flood damages crops, usually not the land; erosion causes land degradation.	Floodplain fishing units are still widely non-motorized, while those on the coast are undergoing rapid mechanization for covering more sweeping areas and handling increased number of gear. Fishing in the sea or coast is highly risky; often boats are capsized; there are frequent incidences of lives lost during turbulent weather. The number of early widows is much higher in fishing villages.
<b>Geographical location</b>	Usually tend to live close to their farming areas.	Fishers have higher level of dependence on aquatic waterbodies and resources for livelihood, spiritual, cultural and other needs, and hence tend to live close to waterbody. This does not mean that people living close to waterbody are all fishers. There are fishers living in peri-urban and urban areas also, who are more involved with marketing.
<b>Political attributes</b>	Relatively more conscious and active compared to fishers.	Fishers are seen to be less involved in political activities, probably due to their geographical isolation and nature of the job.
<b>Cultural features</b>	Many of the cultural activities relate to plantation and harvesting cycle of paddy and other important produces. Hardly participate in any cultural and religious activities relating to risks in water.	Much of the cultural and religious activities relate to the risks associated and production from the waterbody. Distinct sets of rituals observed in the pre- and-post-voyage phases on the coast, and prior to final harvest from the waterbody in the floodplain. Number of rituals relatively higher.
<b>Policy instruments</b>	Peasants are relatively advantaged in the legal structures like constitution, policies, regulations and supports from the government.	Fishers are often relegated in the legal and policy instruments. Their roles in the aquatic resource management are often denied by higher institutions.

Small-scale fisheries are prevalent in both the floodplain and coastal ecosystems with a characteristic variation in catch and biodiversity temporally and spatially. This characteristic heterogeneity in artisanal fishery and fishantry is rooted in the miscellany of the ecosystems, resource base, and socio-economic-religious-cultural and political attributes (some more thoughts, evidences and arguments follow in the later sections of this chapter and also in Chapters 5 and 6). In practical terms, the fishantry is comprehensible not from one analytical dimension, but from a complex, intertwined, overlapping and inseparable web of dimensions. Now I will provide a brief analysis of the different analytical dimensions of fishantry with a focus on similarities and differences between peasantry and fishantry. Under each of the following sections, some indicative comments are made which are elaborated with evidences in the following chapters of the thesis.

**4.2.1. Socio-political dimension:** From the Marxian notion of 'social class' and Eric Wolf's (1966) work on peasants, we see fishers are mostly characterized by powerlessness. For peasants, Marx pointed out that incorporation of peasants into a capitalist system does not necessarily entail a transformation from traditional peasant society and culture in the direction of modernization; rather such incorporations have impacted to reproduce themselves as proletarians as well as peasants, and keep them locked into their socio-politically conservative ways of life (Keesing 1981: 440). Wolf (1966) emphasizes that these rural producers are subject to the 'demands and interest of power holders' who use and redistribute the surpluses to retain their elite positions. Thus, the systems of production generate a fluid or strong existence of social and class hierarchy. As prevalent in the Bangladesh peasantry (Adnan 1983), the fishantry also operates within the domain of a post-colonial state distinguished by the influence of external powers, unequal exchange and systems of dependence, and holding on to many of the erstwhile colonial relationships in thinly disguised forms. Probably an inevitable aspect of the fishantry is the existence of dyadic relationships and interdependence, typified by some form of reciprocity and exploitation within and outside the communities. The issues of social hierarchy and caste system prevalent in fishing villages are elaborated on in section 4.4.1.

Historically in the Bengal Delta, small-scale fishers' way to use resources was more flexible, skill-driven and not impacted by narrow profit-making or 'economic determinism', as it is the case for industrial fisheries. Fishers allege that in the last two decades, they have been exposed to different kinds of external pressures, market relations, values and entitlements which resulted in revised social power structures and sharp inequalities among the wider communities (details in section 6.2 of Chapter Six). The process of expropriation of the produce from aquatic ecosystems is passed onto the relatively powerful section of the society, and thus leads to a further concentration of wealth and polarization of class structure. Because of the increased forces of globalization, fishers' self-contained and closed-in kind of subsistence economy became more interactive and complex as they started producing more for the wider societies. It is important to examine how fishers behave with all their apparent social and cultural conservatism in this transformation from closed one-sidedness of production to more open and competitive two-sidedness of economies. Following Wolf's (1966) explanations for peasants, it can be said that what makes and keeps fishers as fishers is their exposure to different facets of exploitations; because of the societal hierarchy, they are subject to the demands and interests of the small section of power holders.

The boat owners and moneylenders, usually positioned at the top of the socio-economic hierarchy, grant protection and material advantages for mere subsistence to the submissive fishing laborers to the extent that their power base and dominance are not challenged by the laborers either individually or collectively. These relations seem to be the outcome of a transformation from mostly non-motorized, localized, subsistence based, kin-organized unstratified fishing to mechanized, surplus producing, class-stratified, profit-oriented and larger territorially-organized fishing. The corollary of the emergence of new powerful social groups (through the process of leasing and the introduction of powerful engine boats, among other factors) is that the kin-based institutions, culture and values might be at stake through the cumulative processes of social exclusion, marginalization, disempowerment and globalization in the near future. Hence caste-based fishers are assumed to rationalize and obfuscate social, economic and political relationships with the newly emerged powerful Muslim fishers within the wider society.

In the fishing communities, it is the family that is the centre of production, consumption, reproduction, socialization and welfare. For peasantry, Shanin (1990) argues that the limitation of the agriculture production itself puts limits on the density and concentration of population. This observation does not necessarily apply for the Bengal fishantry. Rather, the forces of patriarchal society along with poor family planning activities and fatalism about birth determine the size of the family. From my field experience, I can assert that socially and culturally, the caste-based Hindu fishers tend to be isolated from mainstream society with an apparently somewhat conservative and inward-looking worldview revolving around the fishing aspects and their communities, though a small number of them maintain inter-and-intrapersonal relationships with the dominant social and economic structures.

This discussion would remain deficient without a brief examination of the political aspects of the fishantry. Historically, peasants (*raiya*s) of rural Bengal played an active role in resisting the deprivation caused by colonial rulers<sup>2</sup>. However, the role of the fishers within the class 'peasantry' in the past movements is not clearly reflected in literature, and hence remains an issue for further research. My experience is that fishers in Bangladesh, as a socio-political aggregate, have not been able to bring forward any reformist or revivalist movement, mainly because of a lack of class consciousness, vibrant leadership, confidence, solidarity, cross-scale networks, and isolation from the mainland/mainstream. Further in-depth studies are needed to explore what issues made peasant cohesiveness a potential basis for political class formation, and what factors are responsible for the failure of a similar class formation in the case of the fishers.

**4.2.2. Economic dimension:** Raymond Firth's (1966) work on the Malay fishermen and their peasant economy, and Alexander's (1995) work on Sri Lankan fishers reveal typical

<sup>2</sup> Some of the remarkable peasant resistance against the agents of the British East India Company are '*Fakir Sannyashi bidroho*' (literally, proletariat resistance, from the 1770s to the 1780s) led by the religious leader Majnu Shah (and later by Balaki Shah of Bakerganj, Kalu Shah of Comilla, Syed Aga Muhammad Reza Beg of Sylhet); tribal '*Chakma*' (*Jhum* peasants) guerilla warfare against company policy to levy cash rent (culminated through the signing of the peace accord in 1787); Titu Mir's rebellion in 1833; *Sherpur* Rebellion led by Tipu Shah (1824-1833) popularly known as '*pagal bidroho*' (Mad's rebellion); Rangpur peasant rebellion of 1783 led by Dhiraj Narayan against Devi Shing; 'Indigo resistance' and '*Santal* rebellion' of the late 1850s; *Faraizi* peasant resistance led by Dudu Miah; 'no-rent strike' (*dharmaghat*) of 1873 and also movements like '*Tevaga*', '*Nanker*', '*Tonk*' which all characterize the movement spirit of the peasantry. The outcome of the peasants' grievances was the 'Bengal Tenancy Act, 1885' that helped in reforming the code of the Permanent Settlement and restoring the rights of the peasants.

Asian fishers' economies. However, Firth (1966) used the term 'peasant' for agricultural and non-agricultural 'countrymen' who share the social life and values of the cultivators. I would like to disagree with Firth's generalization, as I observed that the values shared by the peasants and non-peasants are not always similar and homogenous. I argue that fishers form a typical type of economy that may be diverse, ranging from simple family-based self-employment to complex forms involving multiple actors. As the production process turns towards a high-cost complex form from its low-cost subsistence character, it involves multiple actors and stakeholders and extended relationships beyond fishers' social territory, which together demand a transformation in the traditional form of patron-client relationships. With the growing pressure of unemployment, the traditional experienced fishers are eventually forced to compromise, adjust and survive in a new competitive deal, what Wolf (1966) describes for peasants as their continued efforts for retrenching and renewing social relationships with the power-holders within a narrower orbit. The technological shift among the fishanry in Bangladesh has occurred in a relatively faster fashion compared to the terrestrial agricultural production technology of peasants (see Khan 2003 for details on the evolution of the production technology of peasants). This issue has been elaborated in section 6.2.1 of Chapter Six.

The penetration of the 'new capital'<sup>3</sup> and associated market forces inevitably has impacted the fishanry as a social class and as a way of living. In the floodplains, most of the fishers own low-cost fishing equipment. In the coastal artisanal fishery, only a small number of the coastal fishers own efficient means of production, while most of them end up as coerced laborers in a semi-capitalistic<sup>4</sup> mode of economy. To many of them, fishing

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<sup>3</sup> New capital penetrates mainly through the process of massive mechanization. Such massive mechanization has been chiefly reinforced by the international donors. Non-fisher elites usually take full advantage of such opportunities. Following the devastating cyclone of 29 April 1991, a cooperative scheme distributed around 200 mechanized boats to the fishers; fake fishermen's cooperatives grew up overnight to take advantage of the scheme and ironically, after a decade, none are in the hands of genuine fishers. Some genuine fishers who 'put thumbprint and signature' for 'something important', never did see their boats. Instead they now receive repeated notices for 'loan repayment'.

<sup>4</sup> Driven absolutely by commercial logic, this kind of privately-owned production system ensures that the new fishing technology and social organization of the laborers are utilized to maximize profits and meet the increasing demand of the market. In the artisanal fishery, both capital and commercial exchange existed, but the distinction is this mode of production depends substantially on cheap sources of fishing labors and does not usually lead to large-scale capitalist industry. It competes more with the non-mechanized mode of production rather than the industrial mode of fishing.

is considered an occupation of the last resort. Such economies can be analyzed in two ways: 1. through the lens of semi-feudal subjection, considering small-scale fishing as an intermediate state between classical dualism of primitive/non-commercial and modern/industrial fisheries; and 2. as a persistently negotiated entity cross-cutting both of the former views, where the fishers' rural institutions manage to develop a deal with the powerful external agents. The latter form is prevalent among the floodplain fishers where they continuously negotiate with the politically powerful leaseholders.

Because of this mutual interdependence among different actors in such complex social and economic production relations, fishantry can neither be purely reduced to a primordial form nor to capitalist mode of productions, despite the presence of many capitalistic characteristics like the use of wage labor and positive responses to market prices. The pluralistic nature of the locally-embedded social organizations allows the small but powerful classes to make the most of manifold cleavages amongst the majority subordinate classes in terms of communal, religious, caste, ethnic, linguistic and regional segmentation (Adnan 1983).

**4.2.3. Culture, knowledge and institutional dimension:** This angle emanates from the school of thought illuminated by the works of Johannes (1978, 1982, 1989, 2002), Berkes (1993, 1995, 1998, 2003, 2008), Berkes and Farver (1989), Berkes et al. (2001), Berkes et al. (2003), Cordell (1995), Pinkerton (1989), Ostrom (1990), Ostrom et al. (1994) and other scholars who view fishers' strong cultural traditions, ideological solidarity, local institutions, ethnographic knowledge base and the utility of traditional knowledge for the pursuit of sustainable resource management. The very essence of these scholars' views is that fishers possess invaluable local knowledge, and if this knowledge base of the fishers withers away, the very existence of the fishers and their livelihoods might be threatened. The traditional ecological knowledge is quite diverse and distinct from that of the peasantry. This point is detailed in section 5.4 of Chapter Five.

Fishing rituals play significant roles in building a sense of solidarity and enhancing psychological preparations for risky ventures. Among scholars writing on peasants, Redfield (1956) also puts significant emphasis on a culture that holds society

together. Redfield's definition of peasantry as '*a traditional way of life*' also holds true for fishantry. This particular view of the relationship of peasant culture and society is compatible with a variety of theoretical positions such as those that emphasize values or worldviews, those primarily interested in social relations, and those that see society or culture as systemic or integral (Silverman 1983:14). I will elaborate on this issue in Chapter Five under the section 'cultural capital'.

Especially true for the older generations of fishers, their value system, stance towards hearkening to age-old traditions and fatalism show vividly the pathological side of fishantry. Although it is generally believed in the wider Bengali society (reflected through a host of novels and other literary works), that the fishers' worldview is handicapped by their social-cultural conservatism, inward orientation, frustration about declining catch and income, it is equally true that historically they have not been granted proper 'bundle of rights and power' by the state, as they failed to raise their voices concertedly given their geographical and political isolation. Also, their traditional resource management institutions have not been recognized and nurtured, and hence historically the fishers' capacity of building institutions and networking with other cross-scale institutions remained poor.

**4.2.4. Technological dimension:** This dimension has been elaborated on by Kurien (2003). Political leaders of many developing countries in Asia, Africa and Latin America, during the post-independence periods in the latter half of the 20<sup>th</sup> century, adopted capital intensive large-scale fishing technologies for maximizing catches for the betterment of the economy, health, and employment of the socio-politically tired countrymen. The ideology of rapid technological enhancement has similarities with the ideology of green revolution where biochemical innovations and the mechanization of production technologies were expected to promote a higher level of production and be beneficial to all classes of peasants.

Such shifts in the production technologies, promoted by development agencies, and donors have impacted negatively upon the conservation-driven resource use principles, property rights of genuine fishers, their diverse indigenous knowledge and technologies, eventually culminating in the disempowerment and marginalization of

small-scale fishers (*Ibid*). Despite the immense importance of small-scale fisheries in providing food security and livelihoods, fishers are largely sidelined in the management process (Jentoft 1989, Kurien 2003). National policies worldwide often favor the large-scale industrial fisheries over small-scale traditional ones (Crosoer et al. 2006, Ghee and Valencia 1990, FAO 2003, *cited in* Hauck 2007). However, especially in the remote floodplain areas, the peasantry remained relatively unaffected by the impacts of modernization in Bangladesh.

There is no doubt that with increased mechanization<sup>5</sup>, the efficiency of the fishery in terms of the catch volumes and distance covered for fishing increased significantly. I argue that such technological changes fail to benefit the majority of fishing communities, and hence are not neutral. However, a small section of the fishantry readily accepts new changes while the majority takes a cautious pragmatic view from their own direct observations and cultural conditioning. These opportunistic dominant groups, usually external to the fishantry, impose new efficient technologies to ensure a quick return, and in this way the local production system increasingly becomes subordinated to the monopolistic control of transnational interests, where decisions about quality and quantity of production are increasingly dictated by powerful non-fishers.

Usually the poor fishers fail to accept and make the use of new technologies. One important aspect of the technological infusion into the artisanal fishery is that the access to new technologies being differentially situated in society disrupts the traditional relationships and generates unequal power and a domination-veiled persistent form of exploitation. This induces the formation of a typical fishing economy that reduces the majority of artisanal fishers to a social entity of comparatively 'low-classness'. From some cases of Southeast Asian small-scale fisheries (Bailey 1997), we see that rapid mechanization fails to sustainably benefit fishers as the profit maximization tendency eventually ruptures the ecosystem and resource base. The investors may opportunistically withdraw capital in a low-income situation while ruining the long-term fate of thousands

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<sup>5</sup> From almost no trawler in the early 1970s, now 45 shrimp trawlers and 75 finfish trawlers are in operation. In the artisanal coastal fishery, there are 9152 marine set bag nets (MSBNs), 3417 longlines, 25453 estuarine set bag nets (ESBNs), 558 beach seines and 400 trammel nets in operation (source: [www.bdix.net/sdnbd.org/world\\_env\\_day/2004](http://www.bdix.net/sdnbd.org/world_env_day/2004), accessed 20 June 2007). The number of trawlers has increased dramatically in the last few years as a result of a politically motivated decision without considering the standing stock and sustainable yield.

of small-scale fishers. Although the fishers in a more commercialized artisanal fishery become technologically more capable than their predecessors, they are eventually put to a series of disadvantages (such as a decline in the resource base, wholesale marketing controlled by a few powerful persons external to the fishery, etc.).

**4.2.5. Evolution dimension:** This dimension can also be partly justified through the technological and economic angle or a combination of both. It was already mentioned earlier that new technologies and capitals were infused in the artisanal fishery sector in the last two decades (see section 6.2.1. for details). As discussed in the preceding section, a process of '*defisherization*' and marginalization of traditional fishers through aggressive capitalization and mechanization is apparent in the small-scale fishery. Given the situation, the question arises- will fishantry survive?

In this context, the 'disappearance' and 'permanence' theses of Araghi (1995) used for peasantry may be considered. The disappearance thesis assumes that capitalism will lead to the dissolution of the peasantry as individuals become wage laborers in urban areas and capitalist farmers in the countryside. The permanence thesis, by contrast, argues that peasant societies do not necessarily comply with the commandment of individualistic capital, and have a 'developmental logic' of their own that positively impacts the survival of both the peasantry and the condition of its production (Araghi 1995, *cited in* Johnson 2004). Within the domain of peasant studies, the disappearance thesis draws on Marxist thoughts, the works of Durkheim and Weber, Kaustsky's work on 'The Agrarian Question' (1899) and Lenin's work on 'The Development of Capitalism in Russia (1899), while the permanence thesis draws on the works of Nicolai Chernyshevskii, Aleksander Herzen and Chayanov's work on 'The Theory of Peasant Economy' (1966) (*cited in* Johnson 2004). Specially, Chayanov focused on an economic system comprising land, family labor and the means of production as the only possible sources of family income (Archetti and Aass 1978). This family labor-based assumption holds true for subsistence agriculture but can be challenged in the case of the artisanal fishery, where the labor requirement can be addressed through the recruitment and social mechanisms of mobilizing kinship relations. In the case of the fishantry, it can be argued that some form of fishantry would persist and still retain some of its salient characteristics. My stance is

in favor of the 'persistence thesis' for the Bengal fishantry with some degree of socio-demographic and cultural transformation in it.

I propose that the concept of '*defisherization*' usually interplays as a consequence of the population boom, urbanization, modernization of fisheries and livelihood diversity. If defisherization is considered as a livelihood coping mechanism, it is clearly indicative of an outcome of increased marginalization for a section of fishers in the rigorous competitiveness, low catches and threatened biodiversity in the small-scale fishery sector (details given in section 6.2.1 of Chapter Six). Given the divergence of the fishantry, generalization about the defisherization process is difficult. As evident from peasant theories, scholars diverged on the characterization of peasants. For Karl Marx, it is the ownership of agricultural land that fundamentally separated peasants from the proletariat class. What is definitive about the peasant form of production is that regardless of the ownership of agricultural land, the logic of production is mostly subsistence (Johnson 2004). But there are clear differences in fishantry as there are fishers who produce not only for their family needs, but also for profit-making.

The process of defisherization and an evolving nature in favor of the powerful and the capitalist is evident in both the inland and coastal fisheries. As mentioned earlier, in the case of floodplain fishery, the leasing of waterbodies in favor of powerful leaseholders led to the removal of genuine fishers. On the other hand, in the open access coastal fishery, hereditary Hindu fishers struggle to persist as a functionality of compromise or adjustment with the growing forces of capitalism. As prevalent in peasantry (Johnson 2004), there are two fundamental characteristics in fishantry: the logic of subsistence and the retention of at least some control over the means of subsistence.

Economic and social differentiation is not sharply hierarchical in the floodplain, while that is the case in the coastal and marine sector. There are coastal fishers working as wage laborers who are in fact the proletariat group in Marxist terms, as they fail to reproduce themselves from the ecosystem and in essence represent the disappearance thesis. I assert that defisherization as a process is never complete. In my observation, it is in the category of the middle-order non-motorized groups of coastal fishers where the 'persistence thesis' is largely situated. Even if individuals switch conveniently to other

professions, the remaining household members still tend to retain some control over the means of production. Thus a pattern of subsistence fishing persists that may lead to 'refisherization'.

The concepts of defisherization and persistence become more complex when we consider that fishers frequently become victims of socio-political relegations, numerous disasters, and environmental and resource degradations. Defisherization is also linked to globalization. Global capitalism impacts in a way where increasingly larger segments of the world's population are systematically excluded from the process of effective participation (Hoogvelt 2001, Bernstein 2001). Using this thesis, defisherization and the persistence of fishers can be seen as a manifestation of the social exclusion process and their inability to participate in the wider global market. Fishers using traditional fishing technologies assert that the 'external pressures' are increasingly felt through the pressures of capital and technological infusions and an increasing demand for fish and shellfish.

I want to mention that the very nature of the small-scale fishery and its species composition supports a segment of fishers. Artisanal fishery is multi-species and usually dominated by poly-breeders. Irrespective of size, quantity and commercial value, at least some species are available to fishers. For example, the once dominant Indian major carp in the floodplain areas has been replaced by low-value poly-breeder minor carp and some other floodplain resident species. It means that while the income from the valued large-sized species has declined substantially, the marginalized fishers are still attracted to less-valued immature fish for the sake of subsistence. This assertion is supportive of the view of fishers' persistence.

**4.2.6. Production uncertainty and exploitation dimension:** One issue that is certain about artisanal fishing is its inherent uncertainty and unpredictability. In case of the peasantry, a farmer can estimate his production because it is visible on the land surface. Similarly, pond farmers and aquaculturists can also guess about total production from waterbodies. But fishers catching fish from an open waterbody cannot accurately predict their catch levels. This unpredictability and the associated risks provide the ruling class rooms for exploiting and subjugating fishers.

Fishers are usually tuned with the uncertainty and rhythm of nature. In the course of adjusting to uncertainty, low productivity and many other sets of vulnerabilities, they have to surrender eventually to the powerful group for support and building upon social capital. We can postulate that '*fishantry is about an uncertain way of living*' based on the vagaries of nature to which fishers' lives, social organizations and culture are tuned to. As with the peasantry (Shanin 1990:27), fishantry is broadly a pre-industrial social entity that 'carries over into the contemporary society many specific elements of a different and older social structure, economy and culture'. The way fishers survive in extremely unfavorable situations and manage those who manage them, with the help of social and material resources unrecognizable in most policies and formal analytical schemes deserve proper attention.

Fishantry requires some common interest services for day-to-day survival, social-economic-cultural engagement, safety, etc. which together make up a highly traditional and conformist culture. The collective behavior of the fishantry is noteworthy. Beyond the traditional functioning of families for survival, it is the village that provides an influential framework for production and well-being. When the labor input of a single family for certain activities (like marriage, cremation/burial, erecting a damaged house after a cyclone, etc.) is not enough, the kinship ties and institutional reciprocity of the village work together.

**4.2.7. Resource governance dimension:** The resource management pattern under the peasantry and fishantry is distinct. Usually peasants are bound by an identifiable spatial boundary, while fishers widely enjoy fishing in waterbodies as long as major restrictions are not imposed by government or leaseholders. Small-scale fisheries are often open access with little or no control because of the vastness and dynamics of the ecosystem and lack of sufficient human, technical and financial resources, while cultivable land is mostly based on private management with distinct pattern of ownership and individual or collective management. Historically in Bangladesh and elsewhere in Southeast Asia, the issues of fishers' customary rights and fisheries management attracted less attention from the rulers compared to the issues of land administration. I will discuss this issue more in Chapter Seven.

The fishantry framework can benefit from the entitlements theory of Sen (1981). My opinion is that small-scale fishers' low 'catch-per-unit-effort' (CPUE) is not only a state of 'fish availability decline', but also emanates from a rapid decline in fishing entitlements, i.e., the ability and right to fish appropriately to ensure food for a family from a designated zone. Such fishing entitlements are intricately linked to morality, conservation values, functioning of the informal institutions, and belief systems of the fishers that are central to sustainable fisheries management and livelihoods. For fishers, fisheries resources, apart from their economic roles, are also important for social, cultural, spiritual and communal identity.

For floodplain resource management, we observe some donor-driven initiatives (e.g., Community Based Fisheries Management projects- phase 1 and 2) that involve a section of the fishers through capacity building and granting property rights. Though the 'New Fisheries Management Policy' of Bangladesh is supportive of collective actions of the fishers, the macro-and-meso level institutions and legal structures do not favour the poor fishers' entitlements and their local institutions<sup>6</sup>. Because of poor political exposure, fishers and their organizations have little or legally no recognized role in the centric expert-centred fisheries management. There is evidence from many corners of the world that, when left to their own ways of management, under certain conditions fishers can successfully regulate access and enforce rules through community-devised institutions and social practices to use fishery resources sustainably (Hviding and Larsen 1993, Ruddle 1994, Johannes 2002, Berkes 2008).

In summing up, this section introduced fishantry as a new conceptual entity and analyzed it from seven different dimensions. It is apparent that the artisanal fishery deserves a separate body of analytical treatment for the complex and dynamic nature of its production, power relations, social structures, resource management, worldview and indigenous knowledge. Fishantry as a professional class is distinct from that of peasantry. As a social entity with relatively low-classness, it is about marginalized fishers that can

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<sup>6</sup> The 'collective action' school of thought (Baland and Platteau 1996, Agrawal and Gibson 2001, Berkes et al. 2003, Berkes 1995) on institutions takes into consideration the existing rules, informal norms, conventions, social interactions and dynamism embedded within the local culture, while the functionalist 'new institutionalism' school of thought puts more emphasis on minimizing transaction costs for resource monitoring and 'rules in use' in society (Ostrom 1990).

be ideologically framed by the notion of 'smallness' also. Its subsistence mode of production is characterized by inequality which, as Abdullah et al. (1976) view peasantry, is assumed to be 'tolerable, domination veiled, and the stratification obscured by kin-ship and quasi-kinship formation in which dominance is legitimized through extra-economic personalized sanctions' (*cited in* Rahaman 1986: 3). These issues will be discussed more in sections 4.4 and 5.3. Fishantries themselves face fierce competition owing to growing demographic pressures, resulting in the transformation of age-old socio-cultural structures and values. The corollary is that within the artisanal fishery, a process of fragmentation and differentiation, created primarily through economic and political processes among many other causative factors, is more active than ever before.

#### 4.3. The bio-physical settings of the two study villages

*'The fishy smell from the body and clothes of the fishers will tell you who a fisherman is and who is not. Fishing villages are villages of the fish also, live or dead; these areas are distinct and designated for the poor creatures, not for rich gentlemen.'* Shoshanko Jaladas, 67, Thakurtala fishing village, Moheskhali Island.

In the preceding section on Fishantries, I argued that the fishantries are distinct from other rural occupational groups in the sense that they behave as a social unit with certain degrees of ethnocentrism and stratification, as an ecological unit, as a mental or cultural unity, as holders of a collection of institutions, as typical way of life, and as a social process. There are both commonalities and differences between the two study villages. Both villages represent typical shanty characters of rural areas of Bangladesh, but neither represent the pinnacle of fisheries modernization. Strong fishy smells and poor hygienic conditions were prevalent in both the study villages.

Inhabitants belong to their own village in a way they belong to no other social entities. On any definition of community, 'the village is a community- a social group with many functions, not all of them explicit, and to which people are committed by birth or marriage, and bound by many ties' (Stirling 1965, *cited in* Shanin 1987: 38). Villages are usually composed of patrilineal and patrilocal households with distinct lineage groups forming clusters. The main functions of the lineage are to cooperate in livelihood activities and provide protection in social conflicts.

Fishing villages maintain web of group relationships with like-minded villages (inhabited by similar caste or social groups) for serving a multitude of social, economic, political and religious functions. The villagers exercise absolute *de facto* pasture rights within the village. Almost all the men and more than half of the women are born in the village, thus giving impetus to patrilineal relationships. The rights and duties of villagers are not precisely defined and are particularly variable; however commonalities are observed in the participation of common village-level rituals. A person's position is determined by his/her involvement and hierarchy in informal institutions, sex, age, wealth, urban contacts, possession of indigenous knowledge and linkages with political and administrative institutions. However, in most of the rural settings, ownership of the agricultural land is an important determinant of social honor and power (Jensen 1986). Fishers are usually considered as being proverbially conservative, but development efforts of NGOs and donor-aided projects and the great increase in communication with the outside world make them amenable to changes.

Most of the houses in the villages are in poor condition; houses are mainly thatched or covered with cheaper roofing materials like polythene and dried coconut leaves; the ramshackle appearance of the homes become worse in the rainy season. The kitchen is usually located inside the house; however open cooking outside the home during dry months is common. For most of the families, household utensils are mostly limited to a few pieces of cooking pots, mugs, rice plates, storage bins, sieves, pitchers, chopper, small spades, kerosene lamp, broomsticks and mats. Hindu fishers usually use 'Lungi' or typical white 'Dhuti' (*plain loin clothes*), while Muslim fishers wear 'lungi' only. While in festive moods, the young fishermen prefer to have typical hairstyles, sunglasses and cheap blue jeans. Married Hindu woman apply vermilion (*Sindoor*) at the parting of the hair. Both Hindu and Muslim fisherwomen wear 'Shari'<sup>7</sup>, but there are intricate differences in their dressing pattern and composition of the 'shari'.

Family ('*Paribar*') is the basic unit of social and economic organization in the village; by and large it is used polysemically to mean aggregation of members dining

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<sup>7 7</sup> *Shari* is a simple but supremely elegant dress of the Bengalis. It is a rectangular cloth measuring about 6-7m and comes in a profusion of colors and designs. There are several ways of draping *shari*, usually pleated 4-5 times at the centre and then tucked into the waist.

from one cooking unit (*Khana, chula*, meaning hearth group) who live under a common roof. The term is also used to mean one's wife. I found six types of families (after Kolenda 1968) in the fishing villages: 1. nuclear family (married couple with or without children), 2. sub-nuclear family (a widow living with her children), 3. supplementary nuclear family (married couple living with widowed mother/father and unmarried brothers and sisters, if any), 4. lineal joint family (a married couple and married son and other unmarried sons and daughters), 5. collateral joint family (two or more married brothers with or without a widowed mother/father and unmarried brothers and sisters, and 6. lineal collateral joint family (two or more married sons living with their parents along with other unmarried brothers and sisters).

There are relatively more extended families in the coastal Hindu fishing village compared to the floodplain Muslim village. This is partly attributed to the perceived value orientation of staying together. It is also true that the aggregation of family members in extended families is attributed to serious land scarcity in the study area; aggregation is also useful in the subsistence mode of production, to minimize living costs and ensure social security. Within the family, it is usually the husband who is nominally the head as main earner and provider of food, but the role is automatically delegated to his wife or eldest son at a certain stage. In the case of an extended family, the old parents help to make critical decisions in 'marriage' and rituals. In the Muslim fishing families, usually the senior most women (old mother or elder brother's wife) play distinct roles in maintaining and advocating 'purdah' for social respectability and religious reasons. Irrespective of fishing groups, usually it is the female head who decides on the amount of rice to be cooked, types of curries and seed storage.

Children assist their parents in day-to-day domestic activities (like fetching water, washing, cleaning) as appropriate to their gender roles. Grown-up girls are encouraged to learn techniques of domestic activities as a preparation for their married life in 'father-in-laws' houses. Marriage is a socio-religious and economic contract and settled through a series of ceremonies. In both study villages, marriage is virilocal (the bride moves to her husband's house as the post-marital residence); she gradually adjusts to her new social world. Inter-village marriage is common in the Muslim fishing village, while the Hindu fishers prefer distant supra-village level connections. Local dialects and common day-to-

day vocabulary in the two villages are distinct. While people from other districts are quite critical about these dialects, the villagers hold a strong sense of pride in their own colloquial versions.

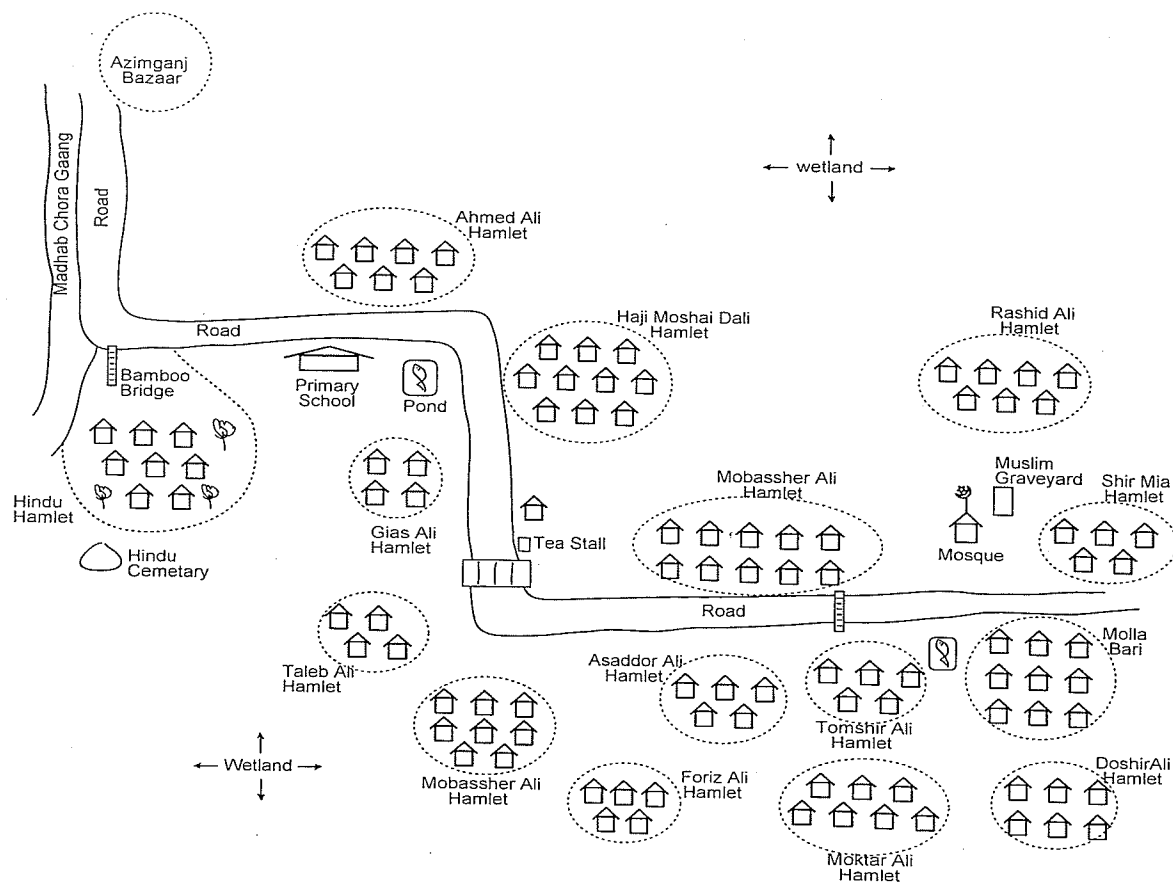
#### 4.3.1. The floodplain village 'Volarkandi'

This village (Figure 4.1) represents a typical dynamic floodplain ecosystem situated inside the Hakaluki<sup>8</sup> *haor*. With an area of around 2 km<sup>2</sup> and a population of 1240 (male 640, female 600; total 184 households- Muslim HHs 165 and Hindu HHs 19), the village is located at one corner<sup>9</sup> of the 'Sujanagar' union, Baralekha, Moulavibazar district.

Located in the northeast region, Hakaluki *haor* is the largest (area: 45,872 acres, including 12,364 acres of beels) natural wetland of Bangladesh and one of the largest in Asia, comprising over 238 interconnecting small, medium and large perennial and seasonal beels (wetlands). Geographically the *haor* is located between 24°35'-25°44' Northern latitude and 92°01'-92°09' East longitude. With an area of 18,115 hectares, the *haor* is connected with 5 upazillas (sub-districts) namely *Borolekha*, *Kulaura*, *Fenchuganj*, *Golapgang* and *Bianibazar* with 40%, 30%, 15%, 10% and 5% of the area respectively. Besides being a source of subsistence and commercial fishing, this *haor* is considered as major source of rice, grazing ground for livestock, fuel woods, foods and fertilizers for the local people. Given the dynamic hydrological cycle, livelihoods from agriculture and fisheries follow a sequential and conflicting pattern. While the productive *beels* of the wetland is leased out by the government, a *de facto* set of rights for harvesting natural resources is exercised by the surrounding villagers beyond the *de jure* forms established in the leases.

<sup>8</sup> There are some stories about the nomenclature of the Hakaluki *haor*. The word originates from the Bengali word 'Sagor' (meaning sea) that locally deviated to 'Sayor' to 'Haor' and 'Aour'. Some believe the tribal 'Henkel' groups lived in the area who named the wetland as 'Henkeluki' (=Hakaluki as per local phraseology). Some believe the 'Kuki' leader 'Hangor Singh' escaped and took shelter in the area being fled by the king of Tripura 'Amar Manikkya'. As Hangor Singh veiled (local interpretation 'luka') in the area, the name of the area was Hakaluki (local phraseology of Hangor + Luki= Hangorluki= Hakaluki). Again there is a belief that a landlord named 'Akha' and his civilization was demolished in an earthquake. Hakaluki might be even after the name 'Akha'. Again some Hindu families of Pabujuri and Volarkandi villages believe that being instructed by a Brahmin, a low-caste 'impure girl in her early puberty' gathered flowers for worshipping the Lord 'Shiva'. A heavy earthquake caused at the dissatisfaction of Lord Shiva created the basin-shaped depression in the *haor*. Historically these remote wetlands have always been ideal areas as shelter for the anti-British rebels and freedom fighters.

<sup>9</sup> Remoteness often has an immense impact on the price of essential commodities and produce. One respondent comments: 'when we sell something, the price is low; when we buy something, the price is higher. The businessmen add for transportation costs at their will' (Minu Begum, 39, Volarkandi)



**Figure 4.1: Volarkandi village** (source: redrawn from 'social mapping exercise' by the Volarkandi villagers, 23-4-2006)

The *haor* has been declared as an 'Ecologically Critical Area' by the Government of Bangladesh considering the fact it serves as home and refuge for 284 species of birds (including an estimated 100,000- 150,000 migratory ducks), 106 species of hydrophytes, and many swamps and trees supporting a wide variety of mammals and reptiles). A total of 107 fish species, dominated by small *beel* resident species, major carps, small and large catfish, snakeheads, prawns, eels, minor carp, knife fish and exotic species have been recorded from the *haor* (of which 20 fish species are critically endangered); around 71,000 kg of fish are caught from the *haor* annually (CNRS 2002). The declining health of the *haor* is a major concern for the livelihoods of the surrounding villagers (Ahmed et al. 2008); there are threats from siltation, wetland degradation, deforestation, gobbling up of land by powerful elites, human habitation and settlement, overexploitation of aquatic

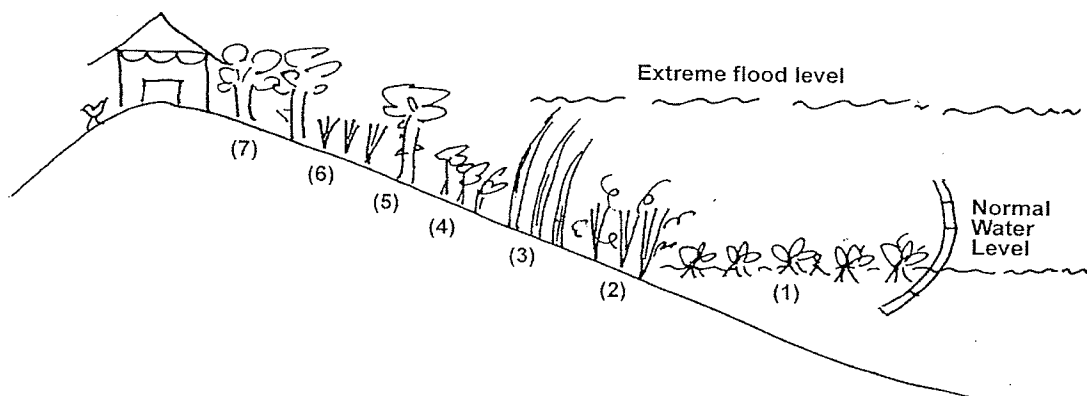
resources, destructive fishing practices and a flawed leasing process of the important wetlands. Among these, massive siltation is predominantly a regional issue<sup>10</sup>.

The biophysical setting is such that during the monsoons, different hamlets and households within the village take the shape of isolated patches of islands. During the monsoons, howling is the means of oral communication between houses and hamlets. Traditional crafts ranging from platforms made of bamboo or stems of banana trees tied together with ropes and small non-mechanized wooden boats are the means of physical communication within and outside the village. There is a popular saying: '*Borshay nao, Hemonte pao*' (literally boats in the rainy season and legs in the dry season are the means of communication).

I observed that the *haor* dwellers have evolved a unique well-thought indigenous practice of maintaining a 'plant canopy' to save their houses from the disastrous waves during the monsoons. At the outer end of the household areas, a circle of free-floating water hyacinth (*Eichornia crassipes*) is maintained, followed by 'nol khagra' (*Phragmites karka*), 'hogla' (*Typha angustata*), 'pati pata/mutha' (*Cyperus* sps.), 'hijol' (*Barringtonia acutangula*), 'korocho' (*Pongamia pinnata*), and cane in the lower elevations and popular fruit yielding trees in the uplands (Figure 4.2). Similar indigenous knowledge of *Jhum* cultivation (Christianty et al 1986, Ramkrishnan 1992), shifting cultivation (Alcorn 1984, Barrera-Bassols and Toledo 2003), soil and water conservation techniques (Bocco 1991, Reiz et al. 1996) and slash-and-burn (Brookfield and Padoch 1994) are documented (*cited in* Berkes 2008: 73-90). During the drawdown phase and dry months, villagers usually walk for going to local markets. The village is around 2 km from the local market 'Azmiriganj bazar', accessible by three-wheeler 'rickshaw', but the road is so slippery and muddy that walking is the best option to reach the village in most of the seasons.

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<sup>10</sup> I asked the fishers and local people about the causes of siltation. Massive deforestation in the hilly areas of both Bangladesh and the Meghalaya hills of India is widely known as a factor. One fisherman interestingly blamed 'cement' for siltation. He explained, 'There you see hills of Meghalaya, India; multi-national 'Lafarge Cement Company' is extracting limestone from the hills using cheap laborers of indigenous communities like *Khasia, Hajong, Mandi, Rava, Kachari* and also local Bengalese. Hills are barren now. ... the extraction of limestone has been so massive in the last few years that with rains of a few days, huge silt load comes down to the lowland *haor* area (*Vhati elaka*) through rivers like *Surma, Kushiara, Mony, Dholai, Juri, Longla* etc. The landscape is changing quickly due to siltation. Earlier we could forecast which river is carrying water causing flash floods; now predictions are becoming difficult' (pers. comm. Mizanur Rahman, 55, Tahirpur).



**Figure 4.2: Schematic diagram of plant succession adopted by fishers to prevent soil erosion**  
 Legend: 1: water hyacinth confined by bamboo shits, 2: cane plants & 'Khagra' (*Phragmites karka*), 3: 'Hogla' (*Typha angustata*), 4. 'Mutha' (*Cyperus* sps) 5. swamps like 'hijol' (*Barringtonia acutangula*), 'koroch' (*Pongamia pinnata*), 'Barun' (*Crataeva nurvala*), 6. terrestrial vegetables, and 7. fruit and wood plants.

The nomenclature of the village relates to the 'kandi' (upland) of the 'vola' channel (note: *the channel does not exist anymore; this incidence testifies to the dynamics of sedimentation*). The livelihoods of the village are by and large dominated by the natural resource base of the Hakaluki haor. Volarkandi is widely known as a 'maimal' (Muslim fishing group; the Persian word 'Mai' means fish) village' with a few families known as 'kishal/khiran' (farmers group) who also switch over to fishing for subsistence. It needs to be mentioned here that the low-lying wetland ('Vati elaka') is famous for the popular folksong 'Vatiali'; these songs have enriched the Bengali culture. Wetland inhabitants are proud of eminent singers and composers like 'Radha Raman', 'Hason Raaza', 'Ukil Munshi' and 'Shah Abdul Karim', among many others.

One narrow tributary 'Komolakhali chorra' surrounds the village that connects the 'Madhab chorra' channel. Fishers use these two waterbodies as the route to the haor. The Hindu communities of the village stay in one small hamlet. The castes they belong to are *Das* and *Ruhidas*. The *Ruhidas* descendents (socially considered as a so-called scheduled caste) are engaged in shoe cobbling/polishing, while the *Das* descendents are engaged in a variety of activities like selling milk and custard, remittance earning, weaving mats, gathering mud and sand, sharecropping (9HHs), self-cultivation (3HHs), carpentry and subsistence fishing. They maintain friendly social and economic relations with the Muslim inhabitants of the village. Reportedly, there is no sectarian conflict between the two religious groups; the Muslims as majority group assist the minority Hindus in

organizing their largest religious festival '*durga puja*'. Old Muslims usually say prayers daily and weekly in congregations (*jumma*) in the mosque; the '*Eid-ul-Fitr*' is the main festival observed after the month-long fasting (*roja*) in the 'Ramadan' period. Many fishers fail to sacrifice animals for economic insolvency during the *Eid-ul-Azha* (festival of animal sacrifice).

#### 4.3.2. The coastal village '*Thakurtala*'

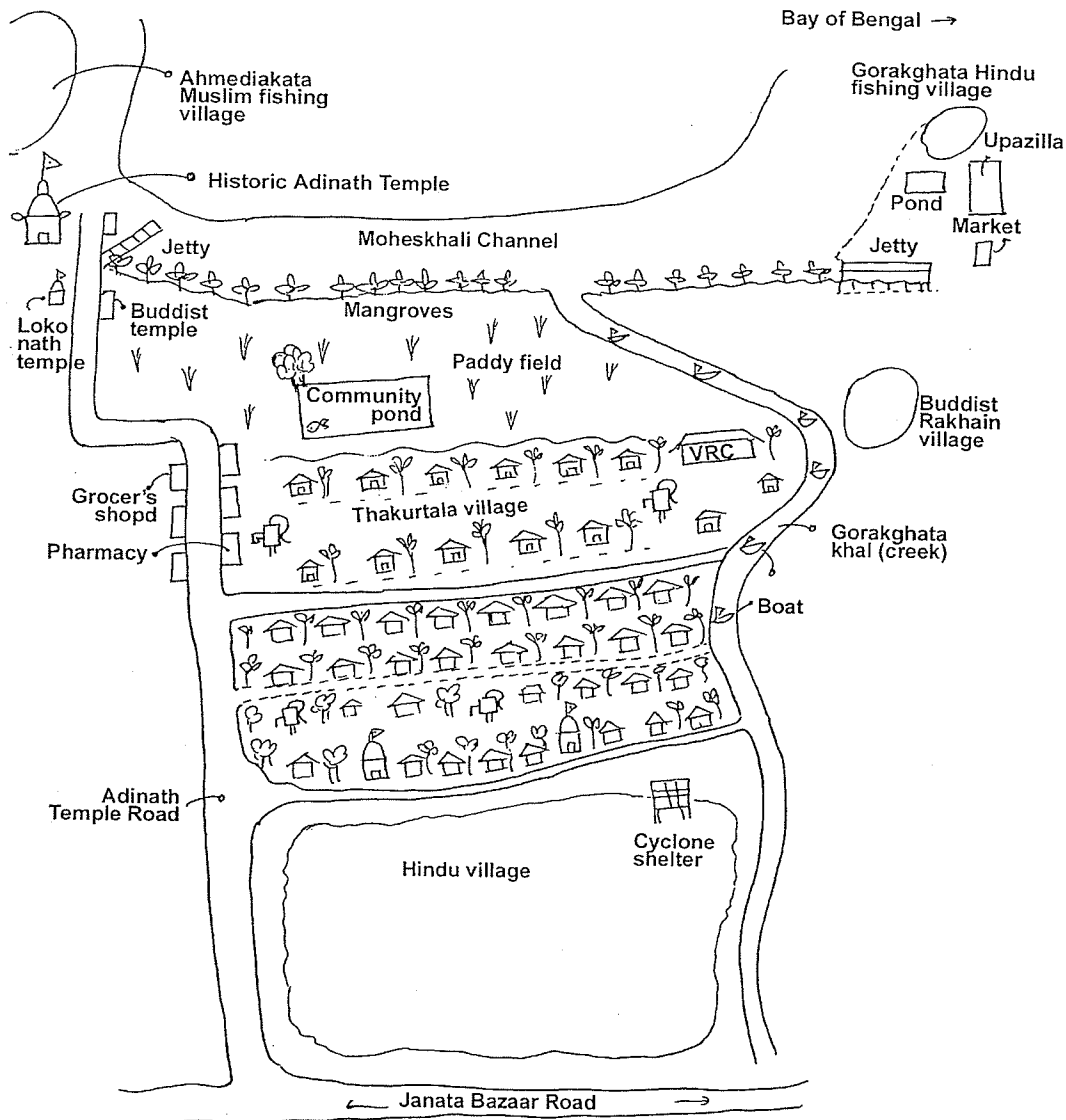
The village '*Thakurtala*' (literally a place beneath the footprint of the God *Adinath/ Mohadev/ Shiva*) is located on the coastal island Moheskhali<sup>11</sup> (Figure 4.3, Annex 5B6). The village is positioned in-between a nice terrain of coastal landscape and the '*Adinath hill*<sup>12</sup>'. Moheskhali Island, with an area of 388.5 km<sup>2</sup> and a population size of around 300,000 inhabiting in 180 villages, is located under tourist city Cox's Bazar district. It is separated from the mainland by Moheskhali channel that embraces the Bay of Bengal of the Indian Ocean. There are 6 ice factories, 3 salt production centres, 178 handlooms, 1 jetty, 3 fish drying yards and 77 cyclone shelters on the island. The village can be reached

<sup>11</sup> There are many stories and myths surrounding the nomenclature of Moheskhali Island. Some believe the island is named after Lord Shiva or Mahesh; some believe the name might be after the local name of buffalo (local term for buffalo is 'mohis'); some believe a strong earthquake separated Moheskhali Island (local phraseology of *Moiscal*, *Moixal* etc.) from the Chittagong district around 500 years ago. However it is widely known that Mr. Cox (the British administrator after whose name Cox's Bazar district is named) handed over Moheskhali Island to one of her maid-servants 'Provabathi' and her generations through 'Korunamoy, Prosonna Kumar, Khired Kumar and Indra Kumar' ran the 'Jamindari' system in the island till sometime around 1952.

<sup>12</sup> Hindus believe that the Adinath hill is one of the highly sacred places, as the Lord 'Shiva' and Goddess 'Durga' stay here. Adinath is one of the 108 names of the God Shiva. The temple, built in 1612, is one of the 52 most sacred ones for the Hindu pilgrims. The history of Adinath is as old as the religion itself; its name as 'Moinak Parbat' is known to have been mentioned in religious scripts like 'the Ramayana and the Puranas'. Hindus believe that to obtain immortality, the 'King Raban' on his way to Sri Lanka from 'Kailash' dropped the statue of Lord 'Mohadev', which he could not lift anymore from the top of 'Moinak hill'. The idol of Lord Mohadev (=Shiva) is still there.

There is a popular saying that one cow of a local Muslim 'Nur Mohammad Sikdar' used to discharge milk on the stonemade body of Lord 'Shiva'. The owner used to scold his cowboy for the little amount of milk obtained from the cow. The cowboy followed the cow one night and observed the evidence of discharging milk on a black stone (believed as icon of Lord Shiva). He reported to the owner and the owner chained the cow. After that the owner 'Nur Mohammad' dreamed the cow was divine and he should release it. He did so and additionally send one Naga saint to fetch an idol of '*Ostobhuja*' Goddess '*Durga*' from Nepal by 1612. In doing so, the saint was caught by the King of Nepal. In the court, the saint challenged the king. He asked the king about the color of the idol in front of the judge. The king mentioned the color was black, but it was found that the idol turned white, changing its original color. The king surrendered himself, and provided all supports for placing the idol. Interestingly, the *Adinath mela* (annual fair) is crowded by common people of different religions from the locality. It is believed that for attaining total divine blessing, one must come down to the Adinath temple after visiting the holy sites of Hinduism.

using a country boat or speedboat from Cox's Bazar in less than one hour; it takes around 20 hours to reach Cox's Bazar from the floodplain study site.



**Figure 4.3: Diagram of Thakurtala village** (redrawn from sketch by villagers, 21/2/2005)

This 'single-caste' village is a traditional fishing village inhabited by hereditary Hindu fishers (population 650- male 300, female 350; households 78- male-headed 61 and female-headed 17). It is not specifically known when human settlement started in the village, but elders claim settlement started here 70-80 years ago. Because of increased pressure of population and land scarcity in the vicinity, the village is gradually transforming into a cramped suburban slum. Internal communication is by tricycle

'rickshaw' and some old jeeps "Chander gari"<sup>13</sup> (literally 'vehicles towards the moon'; redundant jeeps of the Second World War, so far).

The coastal fishing communities are highly disadvantaged and resource poor, uneducated and extremely exploited by moneylenders. Most of them remain indebted; they have little or no access to institutional credit supports. They are highly prone to natural calamities and accidents at sea; family members remain uncared for at least six months per year (male counterparts go for sea-fishing as paid laborers) when women carry exceptionally responsible productive and reproductive roles. These fishers are very knowledgeable about the fisheries resources and the environment. Given the direst consequences of the sharp decline in catch on their income and livelihood security, fishers widely view fishing as an insecure birth-ascribed job and one of the most marginal occupations of the last resort.

#### **4.4. Social institutions in the fishing villages**

In this section, I will focus explicitly on the social identity and institutions which have historically operated in the fishing villages. I discuss exclusively the fisheries-based institutions in Chapter Seven. I will have an elaborate discussion on the gender aspects in the later section of this chapter. The economic institutions will be examined separately in section 6.2.6 under Chapter Six.

##### **4.4.1. Social identities and institutions**

The fishantry itself is indicative of the 'social low-classness' of Hindu caste-based and Muslim social groups of fishers under the existing social structures of Bangladesh. The caste system originated from the occupational, genealogical, and organizational differentiation of the Indo-Aryan system of stratification with a form of institutionalized inequality in which ethnically distinct social entities are absorbed into a ranked status that

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<sup>13</sup> The four-wheelers contribute significantly in mobilizing rural economy. As a cheap means of transportation, these vehicles are so well-suited to the landscape that people still rely substantially on them. Space inside is meant for a maximum 12-16 passengers, but the jeep usually carries 25-30 passengers with hardly any space left anywhere- inside, top, front and back sides. One can see only the wheels. While moving, it looks like a scoop of men moving. One driver told me that while crossing hilly areas, they can touch the clouds and 'moon', that is why it is called a 'moon vehicle'. The driver can hardly see one side of the road and depends on instructions received from his assistant from the back side about the directions and situations on the road. Speedboats are costly and are for rich people and tourists; people like fishermen can hardly afford to get on a speedboat.

is primarily endogamous, birth-ascribed and kin-based (Ghurye 1952, *cited in* Berreman 1983). Fruzzetti and Ostor (1984) identified the following different schools of thoughts on caste:

- a. the transactional theory (Marriott and Inden view the caste system as both moral and natural);
- b. the exploitation theory (Joan Mencher argues the divisions of labor of the untouchables mask the functioning of a 'socio-economic system');
- c. the stratification theory (Dumont argues that caste system leads to differentiation of power and status in a hierarchically arranged system of social inequality); and,
- d. the production theory of caste (taking a Marxist approach, Andre Beteile argues that political and economic changes have not replaced power for ritual status for the low caste).

I follow the stance that not a single theory explains well the compounded crises related to social positions. The hereditary Hindu fishers are thumped by both economic exploitation and birth-ascribed low-classness in the wider society, while the Muslim fishers face a different kind of socially-ascribed low position. In the case of hereditary Hindu fishers of the coastal fishing village, singly or together the transactional theory and exploitation theory fit well, while in the case of floodplain Muslim fishing village, the stratification and production theories explain the characteristics better. However, I must mention that generalization is difficult, as there are variations within and across communities.

The level of functioning of the social institutions is indicative of the strength or weaknesses of social capital. The theory of functionalism put forward by Malinowski (1922) states that the needs of the individuals in a society are satisfied by the social structure of his culture, whose function is to satisfy human needs; to meet basic human needs (biological, instrumental and integrative needs), the society develops institutions that dovetail not only with the needs they fulfill, but also with each other. The structural functionalism put forward by A.R. Radcliffe-Brown argues that various aspects of a society can be examined closely in terms of their institutional functions (*cited in* Bates

and Fratkin 2003: 45). Adger et al (2003) put forward the notion of power relations<sup>14</sup>. They explain that the powerful in society manage to hold their privileged position by legitimizing it through a system of rules, conventions and institutions in their favor. In any community, individuals with varied interests and motivations tend to generate conflicts with each other, breach the orderly pattern of events, or even create unwanted situations confronting the common interests of the community as a whole (Fraser 1966: 41). For tackling such situations, leaders and seniors often sit together to arrive at an acceptable solution. Krishna (2002) found that the existence of rural leaders to mediate multifarious conflicts was necessary to keep social capital vibrant and make it more conducive for economic development, community harmony and democratic participation.

For around 80% people of Bangladesh living in the villages, social institutions- especially the informal or indigenous institutions- are very significant. Anthropologists and sociologists view 'institutions as an enduring status and role, sets of which collectively shape the behavior of a group of people' (Wallis 1985, Jary and Jary 2000, cited in Islam 2002); institutions often serve as clever solutions to many trust-oriented social problems and malfeasance in the arena of natural resource management and rural economy. However, institutional economists view institutions as rules of the game in a society or more formally, as the societal constraints that structure and shape human interactions (North 1990). Westerners have long viewed the rural institutions of deltaic Bengal as the ones usually unlike the corporate institutions, what Tepper (1976) terms as '*institutional atomisation*'. Other scholars view these informal institutions as the product of the deltaic ecology, dispersed rural settlement and openness (Khan 1996) of the 'elusive villages' (Bertocci 1970).

A brief discussion on the 'Bengali *Samaj*' is a must for an understanding of the local institutions. The prevalence of '*samaj*' (etymologically meaning to live together or a residential brotherhood) as a traditional social institution for collective actions (with or without connections with formal institutions) manifest the importance of 'sticking

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<sup>14</sup> The process of gaining and exercising power is interesting in the rural areas. Hopkins (1964) in his 'theory of influence process' mentioned that '*the higher one's rank, the greater one's centrality; the greater one's centrality, the greater one's observability; ... the greater one's centrality, the greater one's conformity*' (cited in Creswell 2008: 53). Later we will observe that the leaders placed at the top of the hierarchy also enjoy some form of social conformity.

together for better or worse' in the day-to-day parlance of the villagers. It is like a small community and a morally-defined symbiotic institution that is horizontally larger and distinct than one's family and kin group. The '*samaj*' as a holistic concept crystallizes and represents hierarchically-linked groups of people demonstrating affiliations to common socio-cultural and ideological<sup>15</sup> roots. Some historic accounts of '*samaj*' are available from the works of Wilson 1855, Maine 1871 and Powell 1896 (*cited in* Karim 1990). Many South Asian studies on the political anthropology of rural leadership and power structure categorically reveal an analytical dichotomy between traditional and emerging leadership (Beals 1969, Islam 1974, Jahangir 1979, Arens and Beurden 1977, Karim 1990, Adnan 1997). Its social control mechanism is psychological coercion or manipulation according to socially constructed notions of honor and shame (Bertocci 1996:17).

Depending on the practical need of interaction, a '*samaj*' may or may not have vertical and horizontal linkages with neighboring '*samaj*' and other cross-scale higher formal institutions. '*Shalish*' (village judicial system) is an integral part of '*samaj*' that helps to maintain normative disciplines through the leaders' exercise of adjudicating power ('*khomota*') conferred on them by villagers. The interplay between the old and new values in the process of social change and the demonstration of the corresponding changes in political and ritual roles and relations have been aptly mentioned by Epstein (Epstein 1967, *cited in* Karim 1990).

The exercise of social power is important in determining one's position and acceptance in society. Oscar Lewis (1958) claims that factors like wealth, family reputation, genealogical position, education, connections and influence with outsiders and age are critical for caste-based '*Jat*' leadership. Jahangir (1979) argues that land holdings constitute the most important source of power in village leadership. However, I found there are some more critical determinants of power in the fishing villages (Table 4.3).

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<sup>15</sup> The Bengali literati like Nobel laureate Rabindranath Tagore and many others viewed '*samaj*' as a 'social and moral regulator' from the viewpoint of the 'religion and caste-based class' (like *Brammoh samaj*, literally society of the Brahmins). They viewed the independence of *samaj* is greater than all forms of independence. The literati's view *samaj* as an unchanging essence of Indian life that is unhampered by political transformations (source: Gupta 2006).

**Table 4.3: Determinants of power and leadership in the fishing villages**

Determinants of power	Specific attributes	
	Floodplain village 'Volarkandi'	Coastal village 'Thakurtala'
Economic	Ownership of land; leaseholder of waterbody; remittance flow	Ownership of mechanized engine boats; engine power; moneylending business
Social	Membership in the local elected body- 'Union Parishad (UP)', village committee and mosque-based institution	Caste-based social position; patrilineally ascribed village leadership - 'sarder' system that is unique for the caste-based fishers
Political	Linkage with CBFM, DoF, CNRS, police and upazilla administration	Linkage with politically powerful local Muslims, UP chairman and ward members
Religious	Attachment to mosque committee	Priest
Institutional/organizational	Membership with CBFM; linkage with DoF and CNRS-led resource management committee	Affiliation with UNDP supported project; linkage with upazilla administration and DoF/ ECFC-led resource management committee
Physical	Owners of brick-made houses; relatively better livelihood pattern	Owners of semi-pucca house and tube well; little showing off for security reasons
Human	Educated or basic literacy, family members go to school, vocal, loud voice, judgment ability	Educated or basic literacy, family members go to school, vocal, bad mouthed, capacity to organize
Cultural	Not applicable	Ritual performers
Others	Physical strength for fighting, 'village diplomacy', height	Physical strength, height, courage and attractiveness

*Key: DoF-Department of Fisheries, CBFM-Community-based Fisheries Management Project, CNRS-Centre for Natural Resource Studies, ECFC- UNDP funded project titled 'Empowerment of Coastal Fishing Communities for Livelihood Security'.*

**Source:** Field observations and focus group discussions, 2005 and 2006

I observed that the hereditary/genealogical roles followed by ownership of mechanized boats and command over moneylending businesses are important in the case of Thakurtala. On the other hand, involvement with mosque-based affairs, access to land and remittance, and lobbying with higher political and administrative institutions are important attributes in determining leadership in the case of Volarkandi. As common in peasant villages, there are no special patronymic titles (like *Mollah*, *Sarker*, *Syed*, *Miah*, *Chowdhury*, *Sheikh*) in the Muslim study village that reflects someone's designated power and authority. Now I will discuss specific village-based cases.

#### **a. Floodplain fishing community**

The community in the floodplain area is Muslim in religious faith. Rather than examining what constitutes a Muslim in the classical orthodox sense, I tried to understand the Muslim fishers from their own social context. Based on my field experience, I would

argue that the consciously perceived '*umma muslima*' or 'all embracing brotherhood' of the Islamic faith does not necessarily correspond to the realities of rural society. Though not grounded in religious praxis, a 'class-based fluid system of stratification' exists in the Muslim-dominated rural areas, deeply rooted to social and economic inequalities.

Among the Muslims, social groups like *Mahimal/Maimal*, *Dalatya*, *Dhawa*, *Khatwar*, *Jiani*, *Abdal*, *Doharia*, *Nikari*, *Mahefarosh*, *Bepari*, *Paikar*, *Chaklai*, *Baidya/bebajiya*, *Dom-Patni* and *Kunjara* are recorded to be engaged in the fishing profession (Pokrant et al. 1997). Discussions on the respondents' social status were dealt with much care and sensitivity. The existence of social groups is quite distinct in the district of Sylhet. The dominant social groups ('*khandan*', high status lineage) are 'Chowdhury', 'Talukder', and 'Syed'; they are known to be socio-politically powerful and affluent because of their primary connection to U.K.-based remittance earners. *Khandans* are known to maintain a separate pond (or at least a protected side) for the women and separate room (*baithokkhana* or *Kacahri Ghor*) for the outsiders. There are hardly any socio-cultural relations between these higher and lower order social groups; however, the former groups approach the latter for casting favorable votes during elections and for occasional labor employment.

The fishing community of the floodplain village belongs to 'maimal' social groups. 'Maimal' as a professional community is in the lowest strata in the society; 'kishal' as an agricultural farming community enjoys a higher social status than 'maimals'. Interestingly, with the full written name of a 'maimal' fisher, it is difficult to guess his/her social status. It is known that Muslim societies are divided into three groups: '*Ashraf*' (noble born, perceived as 'Arab' descendents), '*Atraf*' (low born) and '*Azlaf*' or '*Arzal*' (lowest status). Reportedly, the 'maimal' fishers belong to the 'Azlaf or Atraf' category in the stratified society of greater Sylhet. Inter-group marriage and socio-cultural relationships are almost non-existent. One evidence will suffice to prove such tyranny of status: the only graduate (Bachelor of Arts) 'Siddique teacher' of the Volarkandi village, a son of 'Maimal Muslim', failed to get married to an ordinary woman from the so-called upper status 'Chowdhury' or 'Talukder' groups. He ended up marrying a 'maimal' girl.

There are diverse opinions on how these social groups became fishers. Here is a comment:

*'When our grandfathers came here, they saw that the Hindu fishers live well out of fishing. They thought that what the harm would be if they also did the same; fish were plenty in the haor then; in reality almost everybody catch fish. The upper society levels us as 'maimal' as we fish for making a living. Fishing is considered a hobby if the rich catch fish and a low profession if the poor fish...Now, fishing has become an inherited profession. I fish because earning the same amount of money with the same labor and skill is difficult in other work.'*  
Kasheem Ali, 56, Volarkandi.

Interestingly, the Sylhet region as a whole was known to have the highest concentration of fishers in the country with the dominance by Hindu fishers, as per the 1872 census (per thousand of population, 8.2 in Sylhet, 6.7 in Khulna, 3.3 in Barisal, 2.4 in Noakhali and 6.4 in Chittagong) (District Gazetteer 1970, ed. Rizvi 1970). This is attributed to the fact that bounty fisheries resources in the *haor* attracted human population to settle there. The historical root is linked to the fact that the famous Muslim saint 'Hazarat Shahjalal' popularized Islam in the region from A.D. 1303. Many Muslims started settling in the region including those who converted to the Islamic faith. What is significant in the above quote is that fishing has turned to become an inherited profession in the Muslim fishing villages in less than a half-century, as it is prevalent in the case of Hindu caste-based fishers. The upper society views them differently.

In relation to local institutions, like many other typical Muslim fishing and peasant villages, the fishers of Volarkandi are remarkably influenced by their 5-member 'mosque committee' (*Mosjid committee*). Fraser (1966) provided an account of '*Orang baik*' (morally good men) from '*Rusembilan*' (a Muslim fishing village from southern Thailand), who through experience, skill, knowledge, good judgment, and generosity have come to be sought out for their advice and leadership on a wide ranging problems. They perfectly exemplify the adult values which parents strive to instill in their children. The mosque committee in Volarkandi, utilizing the general religious sentiment of the villagers, helps to keep the normative order and solidarity in the village. Fishers expressed the view that the 'Mosque committee' is more than a century old. This information provides us with an idea about when the fishers started settling in the area. Under the supervision of the mosque committee, there is another 5-member committee

that runs the religious school '*madrasha*', but that committee does not play a significant role in local judgments. However, there is the existence of other institutions in the village.

There is a 19-member 'Village Committee' ('*gram-panchayet*') inclusive of 5 members of the mosque committee for the Muslim section of the village. The small hamlet of Hindus maintains another 5-member village committee (*Makhon Das, Rashendra Das, Sukhomoy Das, Paresh Das and Upendra Das*) with representation by only the *Das* descendents. However, for local judgments, they can temporarily pick up other members from the village. In the case of any conflict between the two religious groups, the 'Hindu Panchayet committee' seeks support from the 'Muslim panchayet committee'. Issues like disputes over familial quarrels, financial transactions, cattle damaging a neighbor's plants, sexual scandal and land possession are usually settled by this committee. Committee members are usually influential, well-to-do and landowners; some have fishing businesses and remittance earnings. Judgments are made usually based on the opinions of a majority of committee members. Depending on the complications and legal intricacies, 5-7% of the cases are referred to higher institutions like the 'Union Parishad' led by an elected local chairman and 2-3% cases are referred to the police station for settlement.

The moral order of the village is high; there are rare cases of sexual offences. Ten years ago, the mosque committee failed to 'punish' the son of a rich remittance earner's son for a sexual crime. Since then, the authority of the mosque committee has been challenged by a small remittance earner's group. There is no 'fear of social exclusion' in this village. Earlier, even the committee used to punish the youths for not joining the 'jumma prayer' in the mosque on Fridays; however, those stringent social rules have eroded now. I observed that the penetration of remittance money, even on at a very limited scale, did not shake up the overarching rural power, but helped in the formation of opportunist follower groups threatening the traditional social ties. The new small capitalists in Volarkandi filled the power vacuum initially, then started competing with similar or dominant power sources. Common fishers are found to refresh their relationships conveniently within a narrower social orbit.

### *b. Coastal fishing community*

The coastal village 'Thakurtala' is inhabited by fishers exclusively with the 'Jaladas' (literally, slaves of water) caste groups, in which membership is determined by birth. As Berreman (1983) aptly mentions Hinduism claims to justify the caste system by referring to a powerfully articulated set of concepts like *dharma*, *karma*, reincarnation, etc., whereby one's religious/moral duty is to fulfill the obligations inherent in the birth-ascribed status. The concept of earned, irreversible 'purity and pollution' in one's lifetime is tied directly to occupation, diet, ritual behavior, lifestyle and other aspects of caste *dharma*. The 'Jaladas' fishers fall under this 'acquired congenital pollution' and their low status as workers is enjoined and reinforced by what Berreman (1983) terms as ideology and divine sanction. However, the fatalistic attitude and 'cosmic illusions' (*maya*) of the hereditary fishers help to level off their suffering from the scarcity of basic amenities and other injustices made to them.<sup>16</sup>

Some other traditional castes of the Hindu fishing communities in the region are *Koibartoda*, *Rajbanshi* and *Jolodhar*. Fishers in the recent decades have taken up titles- *Sarker*, *Roy*, *Biswas*, *Majumder*, *Halder*, *Baroi*, *Pramanik*, *Mondol*, *Bain*, *Paul*, *Dey*, *Das* and *Chowdhury*- as a desperate attempt to delete manifestations of the societal curse of the caste system. Within the 'Jaladas' caste, there is the existence of further factions, which I identified as: *Sada*, *Anandi*, *Kedar*, *Petan*, *Deba*, *Basudeb*, *Kichan*, *Projari*, *Mothura*, *Gangaram*, *Sari*, *Kam*, *Romai*, *Chondi*, *Joyram*, *Munder*, *Shova*, *Lalmohan*, *Borodome*, *Porshuram*, *Gulmanikya* and *Chura*. Among these, the 'Sada' and 'Deba' factions are known to be more prestigious than the others. There are two off-the-record

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<sup>16</sup>The symptom of 'acquired congenital pollution' is vivid in different religious scripts. I found in the epic 'Mahabharat' that an exquisitely beautiful fisher's girl 'Matshya Gandhari' was so 'fish-smelly' that nobody approached her. Once the girl approached a saint 'parashar muni' and begged to him: 'I am the daughter of 'low caste' 'Koibarta Das' root fisherman 'Das Raja', (literally meaning that there was a king from fishing families also); my body is bursting with fishy smell; nobody comes near me' The saint was surprised to see her beauty; he relieved her of the fishy smell and embellished her with a 'lotus smell' by his divine power; the saint married her and later she gave birth to renowned lord 'Veyashodeba', the founder of 'pandov' families (source: page 100, 18<sup>th</sup> segment of the epic *Mohabharat*, written by *Mohakobi* (great poet) Kashi Ram Das; publisher Sree Beni Madhab Shill, Calcutta).

Fishers proudly mention that the supreme God-head Lord 'Sree Krishna' himself took camouflage of a 'fisherman' to preach Lord 'Arjuna' before the 'Kurukhetto' war. Many fishers believe their sufferings have roots to religion. Lord 'Rama' put a curse on a fisher. While Lord 'Rama' was enquiring to a fisher on the riverbank about his beloved wife 'Sitaa' (who was snatched by 'Raban'), the fisher replied, 'I suffer from my own worries; how shall I think about your wife.' Lord Rama was very unhappy with the answer and put curse: 'you will always remain in sufferings and worry'.

groups among fishers as well as village leaders, namely '*Anikkya jaladas*' (literally to mean original fishers) and '*Rohinga*'<sup>17</sup> *jaladas*' (meaning migrated or displaced fisher from another village; a bit 'low' in social status and command within the fishing village). Interestingly, one of the leaders of Thakurtala belongs to '*Rohinga jaladas*'. Such status of groups was valued during marriage ceremonies. Even two decades back, inter-caste marriage between '*Anikkya*' and '*Rohinga jaladas*' was not usually permitted; now such a shadow inter-caste division is gradually losing its appeal.

Now I will focus on the social institutions of the village. The traditional fishing villages, unlike other peasant villages, will not be understood fully without having a thorough idea of the deep-rooted local institution. I examined the local institution intimately; attended a series of 'judicial sittings' ('*gram salishi*') and other social occasions in a couple of traditional fishing villages, and interviewed key informants therein.

'*Sarder*' (literally the head or leader of the community who plays politico-jural roles) and '*sardery*' (literally the system led by '*sarder*' and also bears the connotation of what the leader does for the orderliness of the social reconciliation or establishment) symbolize an age-old institution, which is very much archetypical of the traditional fishing villages of southeast Bangladesh. Fishers claim that the king 'Ballal Sen' granted them this leadership authority. '*Sardery*' is not synonymous to '*samaj*', but embodies the functions that '*samaj*' as a relatively loosely-connected group does. '*Sardery*' as a corporate social organization is not recognized by the government. It could not be decided for certain when this institution began, but old fishers stated it started at least 5-7 decades ago. The survival of such an institution for several decades is attributed to the fact that the system has been widely accepted for its promptness, followed by a threat of 'social exclusion' for those who dare to contravene. '*Sarders*' are relatively wealthier and they own boats, nets and engines, and their family members hardly work as paid laborers.

In each fishing village, there is at least one '*sarder*', the most-talked-about figure in the community for a number of reasons. However, in a few fishing villages with

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<sup>17</sup> The word '*Rohinga*' emanates from the Muslim refugees who are known to have been evicted by the military regime of Myanmar from the Arakan province of Myanmar to the Teknaf peninsular region of Bangladesh around two decades back. Such push back caused huge social and humanitarian crises for Bangladesh.

several hamlets (*para*), it is not unusual to find more than one *sarder*. In such cases, the aged '*sarder*' is given *de facto* seniority. Inevitably, with each '*sarder*', there will be one or more '*Mukkhya*' (literally chief adviser to '*sarder*') and '*Mannyamaan*' (literally respected persons). In the absence of '*sarder*', the '*Mukkhya*' with support from the '*Mannyamaan*', can represent him. There is no manual for this rural judiciary system; the ethical codes and judgments of the '*sarder*' remain mostly unchallenged, except for a few cases where the '*sardery*' system is confronted by well-off fishers. The usual combination of '*sarder*', '*mukhya*' and '*mannyamaan*' is 1:1:1. However, in different larger fishing villages with multiple sets of kinships, combinations like 1:2:2, 1:2:3, 2:2:4 and 2:4:6 were found to exist. In the fishing villages that lack '*sarder*' due to death or other reasons, the '*mukhya*' plays a key role.

A 10-village coordinating body of '*sarders*' exists<sup>18</sup> (see Annex 5, Plate 5B1). The inter-and intra-village hierarchy in terms of prestige and power distribution is: *10-village 'sarder' council* > *Village level 'Sarder'* > '*Mukhya*' > '*Mannyamaan*' > *Common fishers*. A '*sarder*' enjoys '*sardery*' so long as he is capable; he can quit the position himself, but he shall never be downgraded to any other position. The 'Brahmin priest' Mr. Nirmal Chakraborty enjoys the status of 'one village' alone, and is honored as '*sarder of the sarders*'. The 10-village council grants authority to the institution for social peace and stability. In most of the cases, '*sarder*' is the outcome of the family dynasty; a '*sarder*'s son will be a '*sarder*' is the common rule. There is no room for the women to attain the position at any stage of the whole '*sardery*' system, although there are proven female leaders in the fishing villages. A leader argues:

*'It is quite inevitable that young girls will be married; after marriage they will go to their husband's house; again those who come to fishing village as married women have little or no idea about the villagers of in-laws. How will they have a say on the community affairs? Again, it is impossible for women to bear all these loads of 'sardery' beyond their familial responsibilities. Women are poor in command, and they lack loud voice to control meetings'* (interview with Mr. Nirmal Chakraborty, Chief of the Group-10 Village Council, Moheskhal).

In case of father's death or incapability due to physical illness, preferentially his son (usually the eldest one) or his brother or cousins will take up '*sardery*', subject to

<sup>18</sup> The '*sarders*' of the 10-fishing villages (namely, '*Kakara, Ghunia, Koierbeel, Khutakhali, Idgah sadar, Ramubazar, Pourashova Jaladaspara, Gorakghata* and *No. 6 Jetty Ghat Jaladaspara*' of Cox's Bazar) form an apex group; Thakurtala is yet to be included in this G-10.

approval by the '10-village sardery council'. The above noted sequence is equally applicable to 'mukhya' and 'mannyamaan' also. The son of a 'mukhya' cannot be a 'sarder' as long as the original 'sarder' has a capable descendent. Under unavoidable circumstances and in case of the 'mukhya's displaying powerful leadership, the '10-village sardery council' may consider promoting him as the 'sarder', if he is not a 'shangha'<sup>19</sup>. However, in case of marriage, any potential youth can be a candidate for a 'sarder's daughter'.

Under the system, there are no hassles and financial loss that are usually incurred by running legal procedures in the state courts and police stations unless fined by 'sarder' on certain special grounds. The 'sardery' judicial system is fast, mostly unbiased, and efficient; it is largely accepted by the villagers and on the whole, the system successfully neutralizes the social tensions which the legal system fails to address. The issues are confined within the villages, so why bother others with the issue while the prestige of the village matters to its members. The 'sarder' is considered 'an umbrella in the rain and sun'. Fishers believe that without a strong 'sarder', the numerous agonies and tortures from the new entrant Muslim fishermen are very likely to escalate. During any countrywide sectarian violence, the 'sarder' organizes groups of volunteers who under his leadership patrol to protect the women and resources of the village. Though the institution itself is gender-biased in composition, it tends to protect the interests of the women. After the marriage ceremony, the 'bride' as a new member of the village is 'rhetorically handed over' by her father to the 'sarder' and the 'sarder' hands her over to the bridegroom with the public message: *'From today, she is absolutely your life partner; so long the sun rises in the east, she is yours; you have to be with her in all her dismal times; from today, respect her as your mother; treat her as your younger sister and embrace her as the divine partner'*. This symbolizes the fact that the bride through her life will get shelter and support from the 'sarder' in times of need.

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<sup>19</sup> In case any widow was married to a fisherman, the descendants are valued as further low status 'shangha or honra'. They are like untouchables within the community and such segregation continues up to three generations. After that, the descendents are known to become pure. 'Shangha' descendants are not expected to compete for any village leadership port-folio; 'shangha' family members specially the married women are not allowed to take part in sacred rituals (like embracing the bridegroom with candles and flowers on a flat bamboo-made 'Kula') during a marriage ceremony. However, quite exceptionally, widows enjoy a voting power in the village level decision-making process in the absence of their husbands.

'*Sarders*' claim they settle all the disputes except murder cases. The types and frequency of offences (Table 4.4) vary from village to village. The '*sarder*' plays a proactive role in organizing a number of socio-cultural activities which involve the participation of all members of the community. These activities include, among others, funeral rituals (cremation of the dead body and offering meals to villagers after one month) and community-based religious functions. He decides the level of dowry<sup>20</sup> or offerings, the size of the bridal party to accompany the bridegroom, the type<sup>21</sup> of marriage to be solemnized, the date and venue, and finally he signs as a witness for all the social marriages in the village. He settles instantly familial conflicts like fighting (*note*: without profuse bleeding, it is not considered fighting in fishing villages), beating the wife<sup>22</sup>, belligerence towards seniors, quarrels over possession of land and homestead or *de facto* possession of aquatic territory ('*faar*') in the nearby estuary and other material issues. In cases of territorial disputes, more emphasis is given on actual experiential history and social memories rather than legal documents. Unusually complicated cases or conflicts with groups outside the villages are referred to the local government office. The '*sarder*', as the custodian preserves all the legal documents.

From the last three years records of the chief of the 10-village council, the following statistics of offences were revealed (Table 4.4). Usually conflicting parties are made to hug each other at the end. In the case of disputes like quarrelling, beating or disobeying seniors, the accused is warned or fined. In the case of illicit sex, the convicted

<sup>20</sup> Usually the father of the girl pays cash, ornaments, furniture, etc. to the bridegroom's side. 4-5 decades back, there was the prevalence of '*pon pratha*' under which the parents of the lass could receive money from the bridegroom's side. However, this balance is no longer prevalent in the rural villages.

<sup>21</sup> Two types of social marriages are reported. One is '*Chalonta*' where the bridegroom goes to his father-in-law's house for the marriage along with relatives and friends. The other is '*namonta*' where a few relatives of the bridegroom will fetch the lady to go to her father-in-law's house and the sole functions of marriage will be solemnized there. The '*namonta*' type is more frequent in fishing villages while the '*chalonta*' type is preferred by other higher-caste Hindus. The '*namonta*' system is less expensive compared to '*chalonta*'. 'Court marriage' or 'love affair' marriage is almost non-existent. In such cases, the couple will have to sit for a 'social marriage' again in order to be accepted to the *sarder* and wider community.

<sup>22</sup> Humiliation, hair pulling or mild physical torture by the husband without causing 'blood bleeding' is considered something customary in the fishing villages. Parents of the bride give the impression that those who work in the deep sea tend to be a bit crazy. It is not considered as their personal fault but is looked upon as a limitation of the profession itself. It is also widely perceived 'those who feed have all the rights of beating'; 'tolerate as much as you can' is the *de facto* lessons for the women. However, the earning women enjoy greater freedom than the non-earning women. Some of them are so foul-mouthed their husbands are hesitant to irritate them.

are banged and beaten, and for any girl who becomes pregnant as a result of illegal sex, the 'sarder' executes a simple-and-short marriage through exchanging a 'flower garland' in front of the goddess in the temple. If married persons are found engaged in illegal sex, they will be socially excluded<sup>23</sup>. Assaulting seniors or parents and disobeying the judgments is considered the most hated offence. The accused will be beaten, and made to stand and sit for 50-100 times while holding the ears. Afterwards, the accused is given a nasty punishment called 'dondara', which is executed by hanging an 'old shoe' (*choti juta*) around the neck and cutting off hair, and then making the accused walk around the village. A village meeting is purposively called during ebb tide on request from any plaintiff; the plaintiff organizes 'betel leaf, betel nut and lime' for all the attendants<sup>24</sup>. All attendants bow their heads before the 'judge team' followed by the offer around to 'sorbogyati choron' (symbolic 'feet' of wider society). Following 2-3 rounds of arguments from both sides (1-3 hours), the 'sarder' in consultation with his 'mukkhya' and 'mannyaman' makes a decision.

**Table 4.4: Offence type and frequency as experienced by coastal fishers**

Offence type	Frequency of events
Attempt for illicit primary sex	3%
Children-related familial conflict	12%
Disputes over land and homestead areas	34%
Personal clash and fighting of youths/adults	17%
Sanitation-related disputes	12%
Conjugal dispute	7%
Financial dispute	15%

*Source: Documents on conflicts preserved by 10-Village 'Sarder' Council*

<sup>23</sup> In the case of social exclusion ('*Ekghore*'), other families of the village will not invite the convicted family, nor will they share food (or even talk), exchange fire for cooking, let alone attend marriage ceremonies. However, following the death of any member of the accused family, community members will do what is needed for funeral activities. Prior to eating offerings from the bereaved family, the family members will have to seek forgiveness in public from the 'sarder' and fishing community. Usually such humanitarian cases are considered positive by the 'sarder'. Thus the curse of exclusion comes to an end.

<sup>24</sup> 'Paan' (betel leaf) is considered a symbol of hospitality in the rural culture, but it signifies both prestige and hospitality in traditional fishing villages. On occasions like judicial meetings and finalizations of matrimonial talk, the offering of 'paan' is a must. In the case of judicial sittings, the betel leaf is a '*batar paan*' (enjoyed by them who are accustomed), while in the case of a marriage ceremony, 'paan' is '*dhorer paan*' (literally compulsory offer of betel leaves with betel nuts). All the households have to be served with 5 betel leaves and one betel nut with lime ('*paan, supari, chun*') at the nethermost for attending different functions and rituals involved in marriage ceremonies. The 'sarder', 'mukkhya' and 'mannyaman' will have their shares at the ratio of 2:1:0.5 inevitably, like 2 '*biras*' betel leaves (1 *bira*= 80) + 40 betel nuts, 1 '*bira*' betel leaves+ 20 betel nuts and 0.5 '*bira*' betel leaves + 10 betel nuts respectively.

In Thakurtala, other organizations are UNDP/ECFC project supported 'village Organizations (VO)' and some NGO-led micro-credit groups. While the *sardery* make-up pays little or no attention to the development efforts, democratically elected VO leaders are more popular as they are concerned with development planning, savings of the members, education for the children, water and sanitation, disaster planning, income generation activities, and networking with government administration. The odd dichotomy is that in the social meeting, '*sarders*' usually talk nicely with carefully calibrated words about morality, but when it comes to the profit-making issues, some of them tend to apply all the known tricks and techniques to maximize profits ignoring the expected level of ethics. From my short investigation on this issue, I found that the '*sarders*' of *Malumghat, Paharchanda, Veola, Idgah, Shahapura, Khojakhali* and *Tarasghata* fishing villages of Cox's Bazar have embezzled fishing boats and shrimp farms that were offered by the government agencies at low cost and easy terms for the poor fishers.

#### 4.4.2. '*Her world*': Gender role in artisanal fisheries

*'Fishing operation may be viewed as an open-theater drama where women play critical roles staying behind the screen. They usually remain unobserved by the frontline audience; the queen tackles the regiments alone when the king is outside.'* Pronoti Jaladas, 50, Thakurtala.

Pronoti's idea reflects on the role of women in the critical circuits of coastal artisanal fishery. There is a growing recognition of examining the aspects of natural resource management by taking a gendered view, although this view is still atypical in the fisheries sector (Benett 2005). Williams (2008: 180) observes that 'fisheries have long been weak on a gender perspective.... fortunately, the tide of attention to women and more generally, gender in fisheries and aquaculture is turning'. Attempts to make the role of women visible are not easy without a thorough understanding of the social institutions and relations. Indeed, scholars agree that the whole gamut of male-dominated fishing is unswervingly supported by and linked to the intra-household allocation of tasks and responsibilities with a great degree of interdependence and complementarities broadly determined by social relations and norms (Chapman 1987, Pomeroy 1987). The main focus of the research on women's and children's work in developing countries has been

on peasants (Nieuwenhuys 1989), and women's roles in fishantry is widely ignored in anthropological research. In this section, I argue that fishing women in the small-scale fishery play significant roles which are beyond the conventional roles carried out by the Bengali rural women. There is a distinct pattern of interplay between patriarchy and matriarchy in some fishing villages. I would also like to add that the roles of fishing women are broadly influenced by the existing socio-cultural construction of gender and the aspirations for livelihood diversity at the household level.

From a comparative perspective, Rosaldo (1974) mentioned that in most of the societies of the world, men enjoy superior position compared to women as the public and political domains are regulated by them. Although the social status, level of freedom, and political and economic importance of women are varied across societies, it fails to coordinate with or take the place of that of men. Diegues (2002) informs us that until the 1988 Constitution, Brazilian women were not legally permitted to actively participate in the fisheries sector; it was only in 1988 that a Presidential act abolished the prohibition on female labor in fishing. In spite of the legalization of their roles, women are hardly visible in sea-fishing because their presence in the fishing boats is perceived to bring bad luck (*'Panema'*) for all; however women are actively engaged in shellfish collection (*'marisqueiras'*) and near-shore fishing (*'pescadeiras'*). Seemingly, the painful tasks of childbearing by women tend to keep them separated from the public realm in every known society. In a different way, Ortner (1974) argued that 'if men have political control in the public realms of a society, there is always one power- the greatest power of all- that remains mysterious and beyond their control: the power of life itself, of giving birth' (*cited in* Keesing 1981: 305). The observations Rosaldo made on male dominance three decades ago still hold true by and large in the context of Bangladesh.

Is a general framework sufficient to analyze the role of fishing women living in the floodplain and coastal ecosystems of Bangladesh? My answer is both 'yes' and 'no'. First, the differences in the fundamental aspect of freedom, social power, and inequality between men and women applies to both the coastal and floodplain fishing communities. Second, unlike the peasantries in general and floodplain fishing women specifically, the distinction I see in the case of coastal hereditary fishing women is that their roles reach the wider geographical domain beyond the usual domestic spheres. Within these two

broad frameworks, I will examine the gender roles from the context of power, critical roles in livelihoods, interplay between patriarchy and matriarchy, and the patrifocal socio-cultural construction of Bengali society.

Gender is basically a socio-cultural construct for understanding the disparity in power and social positions as a function of biological difference. It is impossible to understand a particular community or society without a comprehensive understanding of its gender relations within the milieu of socio-cultural, religious, historical and political contexts. It is the wider society that defines the gender relations and roles, and establishes the kind of behavior that is appropriate or inappropriate for the male and female therein (Bates and Fratkin 2003: 57). Davis and Nadel-Klein (1997) mentioned that in the early 1980s, when they began to prepare a review of the literature on women in fisheries for the volume 'To work and to weep: Women in fishing economies', they found that most general maritime studies were highly androcentric and the descriptions of women's roles were often confined to a few passing comments or paragraphs.

The 'add women and stir approach' (term used by Boxer 1982: 258, *cited in* Davis and Nadel-Klein 1997: 50) in gender ethnography mirrors the visible roles of women, but does not make gender an explicitly focused analytical construct. Drawing on the lessons from the Republic of Palau, Peninsular Malaysia and Uganda fishing communities, Williams (2008) argues that examination of fisheries and aquaculture with a focus on gender provides a better understanding of the sectors and social contexts. Thompson et al. (1983: 183) argue that in most fishing societies, the division of labor seems in one respect sharp: 'work ashore may be left to the women, or shared, but work at sea is reserved for the men'.

However, there are instances that women have traditionally been involved with their male counterparts even in captures fisheries (though in a relatively limited scale), such as in Vietnam, Sri Lanka, the Caribbean, the South Pacific, West Africa and some other countries of South America (e.g., Brazil). Their roles in culture fisheries in China, Japan, Thailand, India and Philippines are well-known. Brenda Grzetic (2004), drawing on the lessons from Newfoundland and Labrador fisherwomen working actively on sea-going vessels, challenged the neo-liberal representations of fishery workers and

masculine view of fishing (see the classic book *'Women Fishes These Days'* for details). The book articulates the barrage of forces imposed on fishing women determined by the patriarchal rules and culture, and the women's narratives on the ideological and material resolutions on the conflicting issues. McDowell (1984), drawing on examples of complementarity among the roles of Bun men and women of Papua New Guinea, revealed that the use of the Western lens of labor-analysis in fishing overlooks the interrelatedness of gender beliefs and complex local structures. She argues that fishing is neither gender specific nor gender-stratified. Both men and women fish with hooks and nets, while the men were also found to fish with poison. During peak fishing hours, men used to take care of the children while the women continued fishing. However, there is considerable evidence that formal rules and institutional structures which determine a subordinate position for women may still permit significant autonomy and preference for the women; they may exercise considerable power behind the scenes and be economically central and ritually peripheral (Keesing 1981). Although crudely materialistic theories consider that women's status and power are largely dictated by their contributions in the economy, these relationships are turning out to be indirect and complex (*Ibid*: 308).

Generally speaking, women are forced to a relegated position in society. From my intensive case studies, I found that, as victims of household-based preferential treatment, a girl's nutritional status is worse than that of a boy's in the poor households. In any adverse situation, women suffer more than men; it is the worse in case of widows and divorced women. Commonly, some attributes like the cultural construct of masculine heroism (*'mordami'*) in fishing, the requirement of stamina for sea fishing, lack of extra accommodation on country boats for women and the socio-religious norms of observing *'purdah'* (in case of Muslim fishing women) usually prevent women from active fishing. Beyond these, a dominant sociocultural myth is that she, being 'impure'<sup>25</sup>, her physical presence might 'contaminate' the boat, that would in turn bring 'curse' on the male fishers. Old fishers claim that desperation against a poverty-stricken situation forced women towards playing more productive roles in fishing-related activities in recent years.

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<sup>25</sup> The field observations revealed that menstruation is a known 'contaminant'. Also, a widow is not usually permitted to touch the sea-bound fishing boats and participate in pre-voyage rituals. Those women who failed to give birth to child or whose children die after birth, are also viewed as decidedly 'impure' beyond the generally prevalent 'impure' status of women.

Fishing women's roles in fishing related occupations can be grouped into three major categories: i. preparation for fishing, ii. fishing operations, and iii. post-harvest activities. Many fishing women (specially on the coast) play active roles in shore-based fish vending, post-harvest processing (solar drying, salting, smoking and fermentation), net mending, equipment cleaning, and a myriad of complementary activities (Table 4.5, Annex 5B3, 5B5). The involvement of the girls and women in shrimp processing factories (like the Scottish 'herring girls' or 'gutting quines') of southeast and southwest Bangladesh is widely known. In response to economic pressures, both girls and adult women are found actively engaged in shrimp fry fishing in the coastal areas. Some fisherwomen manage their fry fishing business in such an 'entrepreneurial mood' that is no less significant than those operated by fishermen. In some coastal and riverine areas, I found nomadic women (*vede*, *vaidhya*, predominantly Muslims) actively fishing using both fixed and chasing gear. Many floodplain women set monofilament nets and do angling in the vicinity of their houses for nutrition and subsistence income.

Outside the ambit of fishing economies, many poor and destitute women collect, sell and break snails for aquaculture farms. They collect aquatic plants from the beel, such as stems and fruits of 'shapla' (*Nymphaea nouchalli*), root stocks of 'ghechu' (*Aponogeton* sp.), 'fukol grass' (*Euryale ferox*), 'singara' (*Trapa natans*) and leaves of 'kalmi' (*Limnocharis flava*) for household consumption. Such roles of women are very important in terms of family nutrition and food security. Sultana and Thompson (2008), from their comparative study on Hindu and Muslim fishing villages in the south-west floodplains of Bangladesh, mentioned that in the Hindu villages, at least one woman from a household spent about 40 days a year in fishing, while no woman caught fish in the Muslim fishing village. However, around 60% of women and children in both the Hindu and Muslim villages catch snails for household use or for income, and about 10% of the women are employed as snail brokers. It is also mentioned that Hindu women, because of their relatively greater mobility, education and freedom could impress upon more influence in the joint decision making process (along with men) for the wetland aquatic resource management (*Ibid*: 58-67). In Fiji, women usually fish on a more regular basis than their male counterparts, and for a wide range of species (Vunisea 1997). They often target different species in nearby habitats, and hence they have different local knowledge than

fishermen. Because of the relegated social status, women's knowledge is less likely to be valued. Recent studies (Davis and Nadel-Klein 1988, Sobritchea 1994), however, indicate that often times the 'fisherman' is also a 'fisherwoman' in the community due to the overlapping nature of the activities.

**Table 4.5: Analysis of gender roles in fishing occupations in floodplain and coastal areas**

Activities	Men	Women	Boys	Girls	Remarks
<b>Preparation for fishing</b>					
Organizing rituals	C, W	C	-	C	Coastal women's role is quite distinct
Boat drying, cleaning, repairing, painting	C, W	-	C, W	-	Women provide refreshment and company; children assist in setting and filling planks with numerous ingredients
Net cleaning, drying, beating	C, W	-	C, W	-	Children participate through bringing water, carrying nets, beating dry nets.
New net weaving	C, W	C	C, W	C	More by girls and women in coastal areas
Net repairing	C, W	C	C, W	C, W	Usually under supervision of seniors
Net dying with natural dyes 'gub'	W	C	C, W	C	Women prepare the solution and observe rituals associated with it
Net storage	C, W	C, W	C, W	C, W	Inside home on a certain rack
Labor engagement	C, W	-	-	-	Women may plead to employ her relatives
Receiving usury	C, W	-	-	-	Women may take for other than fishing
<b>Fishing operation</b>					
Net operation	C, W	-	C, W	-	Rare case of cast netting by women is known
Bait collection	C, W	C, W	C, W	C, W	On a limited scale by women and girls
Fish catching for livelihoods	C, W	-	C, W	-	Frequency higher in case of boys in wetland; girls also participate in seasonal fishing
Crab collection and shrimp fry catching	C	C	C	C	Crab for consumption and selling; shrimp fry for selling to middleperson
Fishing for family consumption	C, W	C, W	C, W	C, W	More women participate in floodplains compared to coastal areas
Steering, team mgt., engine maintenance,	C	-	-	-	There is very little use of engine among the floodplain fishers
Decision-making on fishing operation	C, W	-	-	-	Job of the senior crew member; he may or may not consult the junior
<b>Post-harvest activities</b>					
Species segregation, icing, fish salting and as paid laborer	C, W	W	C	C	Usually the retailers segregate in wetlands, women on the coasts are active in fish drying yards and big urban markets
Retailing small fish in local markets	C, W	C	C	-	Boys help parents by fetching tubewell water, tea, weighing, cleaning, shouting to attract customers, shuffling fish, etc.
Wet and dry fish vending in the nearby villages	C	C	C	C	Very few aged fishermen, married poor fisherwomen and young girls do vending; it is laborious for olds and also unsafe for unmarried young girls.
Fish drying, smoking	-	C, W	-	C, W	Mostly for family consumption; men and boys are not usually engaged

Key: C= Coastal area, W= Wetland/floodplain area

Source: Focus group discussions with different fishers of different age and gender, field observations and interviews, validated in mini-workshops held in April- September 2006.

I will now examine two interwoven aspects of patriarchy and a typical form of matrifocality. Interestingly, the coastal fishing villages witness a shift in control and authority over the family. The customary patriarchal focus gets automatically shifted to matrifocality when the male fishers leave the households for a fairly long time, but that is not the case for the daily fishing groups of the floodplains. As Sir Walter Scott put it in 1816, '*the government is gynecocracy*' when referring to a clear practical basis of the power of fishing women. There are similar evidences of 'more freedom of speech and action than wives in farming communities' from maritime societies (from studies of Takashima on Japanese Fishing Community, for Malay fishers by Raymond Firth, for Fanti women of coastal Ghana and the lake-dwelling New Guinea Tchambuli community by Margaret Mead) (*cited in* Thompson et al. 1983: 177). Smith (1977) proposes that the very nature of the marine econiche itself affects the organization or configuration of maritime communities as socio-cultural systems that are characterized by a relatively greater dependency on women for land-based food production, resulting in a greater role differentiation and economic independence for the women (*cited in* Davis and Nadel-Klein 1997: 52). Niehof et al. (2005) mentioned about firmly entrenched diverse roles of Madurese fishing women in the Indonesian small-scale fishery. They concluded that the fishing women could retain and consolidate their positions in the process of modernizing the fisheries sector. In rural Bengal, the socio-cultural constructions of the fishing villages often do not recognize the stressful and critical roles of women played in the absence of male fishers, rather such roles are viewed as a God-imposed dutifulness for women.

Compared to the rural Bengal peasantries, coastal fisherwomen face more risks and physical-mental stresses. '*For the fishing community women, it is an ordeal test from God; He examines our patience and devotion for husband.*' says Mitali Jaladas, 35, Thakurtala. It is this psychological stand of 'God specified ordeal test' and the social norms that keep both husband and wife away from illicit and fornicated actions. Within the wider myth of Bengali women, some of the cardinal characteristics of the coastal fishing women are: they are more self-reliant, aggressive, diligent, psychologically stress-bearing, quick in decision-making, less ambitious, pragmatic, extrovert, caring, vocal, bad-mouthed but kind and hospitable. The apparent nature of the vocal, bad-mouth and mannish impression of the fishing women in the wider society acts as a 'self-guarding

safety system' against rape and abduction in an insecure and geographically isolated rural condition, specially in the absence of fishermen. Their distinct roles in observing rituals and making certain a kind of tranquilizing psychological impact for their seafaring male members are of tremendous significance. They do magic in managing all the household affairs with little budget or resources.

What kind of social networks do fishing women maintain? For coping with any adverse situation (especially when male fishers are away for months for fishing), women form special ties and kinship in and around communities which usually do not contradict those of their male counterparts, and those relationships are usually reoriented following the return of male counterparts from the sea. As the men arrive back from the sea, women become reluctant matriarchs as usual. My findings from interviews and focus group discussions with fisherwomen make me believe they are not willing to leave their males for a life-threatening job, and they would have chosen other jobs if better alternatives had been found. This judgment is opposite to that of Danowski (1980) who perceived a general satisfaction of fishers' wives about their husbands' jobs in the sea. The complex nature of distributional and contextual issues of power also deserves attention. Under certain contexts and situations, women hold and display more power than men. In the coastal fishing village, I saw the wives of male moneylenders (apparently as a more powerful entity than male counterparts) appear on the scene for the retrieval of money when the moneylenders themselves run out of force.

Table 4.5 reflects on gender roles at different ages in the whole gamut of fishing operations. It is evident that both women and under-aged boys and girls play substantial supportive roles in the whole fishing operation, most of which are land-based activities as 'ground crews'. Fishing-related activities on land and water are complementary to each other. For example, a higher catch allows for the higher mobilization of women in post-harvest activities. Roles of fishing girls and boys deserve attention. Before attaining puberty, under-aged girls are seen engaged in activities like fish segregation, salting, drying etc. along with their parents or other reliable relatives/neighbors in the nearby fish landing centres. After attaining puberty, they are hardly permitted by parents to move or work alone because of fear of sexual harassment. Any such incidence of harassment will

make her future life perilous. She might not even be married because of the 'bad name' (*Kolonko*) she has gained. Once the girls get married, they play typical reproductive and productive roles in the fishing households. Utilizing both the male and female channels of social relations, some women in the Hindu fishing villages have developed entrepreneurial abilities in the local level small-scale retailing of wet and processed fish products to the extent that they command dominant positions in the community. In the coastal study village, I met 'Jogoti Bala Jaladas', who transformed herself from an ordinary 'fish wife' to 'fish mammy'<sup>26</sup> through playing exceptional roles in mobilizing the fishing operation and business after her husband had fallen to a sea-borne accident. Taking such a lead role is unusual, but her close involvement in the fishing business with her husband and exposures to wider communities created a leverage condition for her.

Boys and occasionally small girls enjoy the freedom of working as cheap laborers (monthly US\$10/person) for the wholesalers in their collection centres. Duties are usually confined to fish carrying, species-wise segregation, cleaning, icing and serving the boss with tea/betel leaf and tobacco pipe. Aged married women in the coastal areas are actively engaged in retailing in the urban/semi-urban markets and they all are well-known for their shouting and uttering bad words. Norr and Norr (1997: 67), from their study on the 'low-caste' fishing communities of the Minakuppam island, Tamilnadu, India, observed that *'every man who fishes has a female relative who looks after his catch: she is his wife if he is married, his mother or elder sister if he is young, a daughter or daughter-in-law if he is an elderly and widower'*. Some fishing women, especially in the coastal fishing village, play similar roles, though not to the extent described for the Minakuppam fishing women. Rosemary Firth (1966), in parallel with her husband Raymond Firth's classic study on Malay fishers, observed that fishing women and men maintained separate economies that were linked to the amount of catches, complex production relations and responsibilities, but with increased mechanization, women's chances for income declined (*Cited in Williams 2008: 182*).

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<sup>26</sup> Overa (1993) uses the term 'fish mammy' for women's careers in Ghanaian canoe fisheries to indicate the scale of women's fish related businesses. A fish mammy is not synonymous to fish mother or fish wife; she is a woman who operates on a large scale in the fishing economy.

Do the fishing women enjoy more freedom than those in the peasantry? Some responses for this question have already been given. Obviously, the roles, power and status of fishing women across societies vary substantially (Norr and Norr 1997). The coastal fishing women tend to work in a wider domain beyond their domestic territories, while the women in the floodplain study village were found limited to their confinements. Floodplain fishing women remain involved in post-harvest operations (like fermenting, fish drying) at the household level, while some coastal fishing women do those post-harvest activities for earning wages in commercial fish drying yards. I gathered this impression from the two study villages that the caste-based Hindu fishing women enjoyed relatively more freedom compared to the floodplain Muslim fishing women. Drawing a comparative view between the fishing and the peasant women, Norr and Norr (1997: 72) concluded that *'within the context of a peasant level society and its general male dominance, women in Minakuppam [fishing village] are relatively independent and unsubservient in their everyday behaviors and relations with men'*. They also hypothesized that usually women enjoy relatively more independence in the lower strata of society; when fishers are lower in the societal hierarchy, fishing women tend to be more independent compared to women of peasant societies. When fishermen enjoy equal status with peasants, their wives do not behave differently; when fishers enjoy higher status compared to peasants, women in the fishing community have less power (*Ibid*: 72-75).

My empirical findings also comply with these observations. In the last few decades, there has been a complex range of developments (with both positive and negative effects), but almost all can be seen as the consequence of progressive incorporation of rural villages into the wider national and global economy and the resultant reorganization of social relationships and livelihood options (Rozario 2004). Without doubt, women have started to penetrate into new livelihood activities previously dominated or monopolized by males (*Ibid*: 123). In fact, artisanal fisheries provide an important vantage point to examine how capital penetration and modernization efforts impact the relation of class and gender. Neis et al (2005), drawing on examples from India, Ghana, Brazil, Iceland, Newfoundland, Nova Scotia, Mexico and Africa, demonstrated that there have been major transformations in world fisheries, and women's lives and gender relations in the world's fisheries sector have been hard-hit by neo-liberal globalization. They observed

that in most of the cases, fishing women failed to reap the benefits of market liberalization within the fisheries sector, and women's generally lower socio-political status causes a reduction in their coping capacity with the adverse effects of globalization.

This discussion will appear incomplete without having a glimpse of the domestic chores carried out by fishing women. Table 4.6 provides a description of the commonly carried out daily activities. This list is not final and omits many other activities which are unusual in rural villages. The socio-cultural construction of the women's roles in domestic chores is '*they are born to serve men so long as they are physically sound*'; this means that women have been trusted with more responsibilities and burden compared to men for caring and sustaining physiological well-being, social and emotional needs. The unpaid skilled practice of feeding the family is a powerful narrative in most of the known culture. DeVault (1991) argues that feeding the family is an important craft in which many women feel pride and satisfaction because they believe the work is valuable, not because they are compelled or coerced by despotic husbands. However, 'the work of caring- however valuable or valued by those who do it- is implicated in subtle but pervasive ways in relations of inequality between men and women' (*Ibid*: 161).

**Table 4.6: Distribution of daily time of fishing women in domestic chores (in hours)**

Domestic chores	Coastal	Floodplain	Remarks
Food preparation (collection from wild sources, chopping, cleaning, cooking, serving, washing dishes, storing foods, borrowing or buying food)	2-5	1-4.5	Food preparation and repairing houses become extremely difficult during and after natural disasters like floods and cyclones.
Family care (washing clothes of all members in the ponds, sundry clothes, bath for the children, breastfeeding children, preparing and serving medicines, nursing of sick and diseased persons, preparation of special foods for children and old, taking care of children's education, sleeping arrangements, weaving quilts, cleaning lice)	2-4.5	2-3	
Clean house and yards (cleaning using broomsticks; fixing floors using water, clay & cow dung)	0.5- 2	0.5-1	
Fetching water (drinking water from tubewell, washing water from ponds or beels)	0.5-2	0.5-1	
Firewood collection (gathering dry leaves, dry branches of trees, chop woods, storing)	1-2	0.5- 1.5	
Livestock raising (monitoring numbers, providing fodder, collection of fodder, animal cares, selling, buying small ones) and homestead gardening	1-2	1-3	

Source: The range of time is calculated based on day-long participatory observations on 'intensive case study families' of the floodplain and coastal study villages in different months, 2005-2006.

Invariably in the rural fishing societies, these laborious jobs of doing family meals are taken for granted as part of the prevailing 'motherly myth'. The absence of basic facilities like electricity and water supply makes their daily activities miserable. On average, women perform 17- 29 laborious activities on a daily basis and the number varies sharply in different seasons (Table 4.6). From the intensive case studies, I found that the time required in carrying out the domestic chores ranged from 7-17 hours depending on the number of persons and their age strata in the family, the economic condition of the family and seasons.

It is interesting to note that through active involvement at different stages of artisanal fishery, fishing women develop their own knowledge base and experience. Fishing women also possess 'gendered knowledge'- characterized by a 'different knowledge of similar things, a different knowledge of different things, different ways of organizing knowledge and different ways of preserving and transferring knowledge' (Norem et al. 1989). Gendered knowledge construction is impacted by differences in role play, rights, access and the institutional norms of evaluating women in a society. Through family-level practical orientation and direct exercise in the real field, occupational skills become gradually professionalized within the framework of socially-bound division of labor. Girls usually learn much from their mother and the boys from their father. After marriage, girls turn themselves into future fisherhoods under new socio-cultural and ecological constructions.

#### **4.5. Discussion**

This chapter introduced a new thematic area for the fishers; it also examined the bio-physical settings and social institutions of the study villages. It is apparent from the discussion on fishantry that fishers have a complex way of life, which is distinct in many aspects from those of peasants. There are both commonalities and distinctions between the inhabitants of the two study villages. Their daily modes of living are profoundly influenced by their immediate ecosystem.

In case of the Hindu fishing village, a caste-based existence and identity of fishing as an occupation is apparent. On the other hand, based on profession and wealth, a fluid form of 'social grouping' is observed in the Muslim fishing village. The Muslim fishers '*Maimal*' are considered socially degraded as is the case for the caste-based '*Jaladas*' Hindu fishers. The social stratification in the fishing villages as a system of structured inequality tends to comply to both the 'functionalist theory' (*stratification is a necessary requirement for the existence of the society*) and 'conflict theory' (*power, not functional necessity, is the key to the stratification, and differential distribution of power accounts for the inequality in valued goods and services*) (Heller 1969)

Compared to men, women in Bangladesh are widely believed to have a relegated position and structural subordination to patriarchy. In the Bengali society, a strong mythical view of women as loving, caring, pure, submissive and dutiful human creatures is prevalent. They are expected to grow up under rigorous socio-culturally endorsed norms, remain unsullied till they are in a socially accepted 'religious marriage', and stay devoted and faithful to one husband till death. Thus a 'man identity' (father, husband, son) persists throughout the life of a woman. In the fishing villages, to be born as a woman is by and large considered a familial burden and social curse, though they serve many productive roles. Such disparities in gender relations impact the human and social capitals in the subsequent generations, causing and sustaining the feminization of poverty.

Within the framework of the unique socio-culture of the fishing villages, fishing women perform reproductive as well as productive roles. Some of the productive roles fall under the socially viewed 'masculine character'. Generally speaking, they enjoy greater freedom compared to women in rural peasant societies. However, in the coastal areas, the fishing women are involved in more productive activities compared to those of the floodplain. The changing patterns of these gender roles in the fishing villages with the increased commercialization of fishing needs to be carefully examined.

In the artisanal fishery sector, especially in the coastal fishery, sharp inequality is not random but it follows an established pattern with relative consistency and stability. From the propositions of Putnam (1993), we can seek answers of why fishers failed to articulate their voices for the restoration of their interests: '*In areas where social relations*

*are more vertical and based on authority relations, then citizen capacity for collective action is limited, and access to and influence over state and market are far weaker...efficient, effective and inclusive governments and economies are characterized by more 'horizontal' social relationships (based on trust and values), and higher levels of participation in social organizations and networks that cut across the boundaries between different institutions and social groups' (Putnam 1993, cited in Bebbington 1999: 2030).*

The next chapter will examine the role of different capitals which contribute fundamentally to the capabilities and livelihood functions of the small-scale fishers.

## Chapter Five: Livelihood Capitals of Fishers

*'We are like half-man in the downstream haor; those who have money and land are full men.'* Torab Ali, 59, Volarkandi.

*'A man without some wealth is valueless in society, nobody shows any respect to him, not even family members; he is kicked like a football.'* Shoshanko Jaladas, 67, Thakurtala.

*'Our culture, our rituals are our prides; other communities might not like these; we find peace in celebrating these.'* Probhati Jaladas, 40, Thakurtala.

*'If fishes are not there, the very basis of livelihoods of fishers are threatened. Hindu 'caste' based fishers will disappear automatically because of 'uncontrollable pressures'. We lost our control over many fishing territories. If there is no land, where will the farmers plough?'* Anar Koli Jaladas, 42, Fisherwomen Welfare Foundation, Cox'sBazar.

*'A man who can't read and write is unable to communicate with others properly in the society. For fishing, however, very little education is necessary; fisher's sons can hardly go a long way; so it is better to concentrate on fishing from the very beginning of boyhood.'* Abdus Salam, 14, Volarkandi.

*'You become a fisherman only when you have nothing to do outside; to be a fisherman means that you are defeated in your life struggle.'* Sadek Miah, 55, Volarkandi.

*'Who can stand in front of Nurul Chairman (waterbody leaseholder and local chairman)? He has the money; he is linked with government political party; he has his own group of thugs; he knows how to manage police and local government officers; none in this area can compete for bidding with him.'* Suroj Ali, 56, fisherman of Volarkandi.

### 5.1. Introduction

The above quotes are quite telling about the multiplicity of the types and conditions of capitals needed to make livelihoods. The word 'capital' bears different connotations in the disciplines of Economics, Finance and Accounting. In classical economics, capital is one of the factors of production (along with land, labor and entrepreneurship) produced by economic system to create goods or services. Due to the heterogeneity of the concept, its measurement is also debatable in economic system (Pearce 1986). Variable capital refers to a form of capitalist's investment in labor-power to generate surplus value, while constant capital refers to investment in non-human factors of production (Hennings 1987). Certain capitals may be used as stock (e.g., fishing nets) to produce a flow (income), value of which may appreciate or depreciate (Pers. Comm. J. Buckland, Sept. 2009). Capital usually meant physical items (e.g., machines) in the earlier illustrations of

economics that are used in the production process. However, Human Development theorists have increasingly focused on social capital and human capital or knowledge capital, while the political theorists put emphasis on political capital (Sen 1990, 1997; Deshmukh-Ranadive and Murthy 1997, Pretty 1997, Pretty and Ward 2001; Chambers 1997a).

Departing from the economistic views, the concept of 'capital' is used holistically in this chapter to capture both tangible and intangible benefits that certain attributes can provide directly or indirectly over a period of time. All types of capitals hold two fundamental characteristics: 'each capital investment entails an opportunity cost (savings or consumption foregone), and each can be used by people to help them increase their well-being' (Rudd 2004: 112). As detailed in Chapter Three, the SL framework (Figure 3.1) is obviously a shift from the economistic trend of income and food consumption narratives to more qualitative, socio-political and rights-oriented areas that focus on entitlement, capabilities, policies, institutions, empowerment, resource governance and sustainability (environmental, social, economic and institutional). Using an *emic* perspective, this chapter examines a detailed, nuanced understanding of the various capitals the fishers employ for livelihood functions.

My line of argument is that although fishers depend primarily on the availability and access to aquatic resources, it is also important to simultaneously examine the level of dependence on other capitals that concerted (or even singly with varying effects) build on fishers' capabilities. This complex nature of dependence contributes to our understanding of the process of livelihoods. It is also important to examine how fishers strategically combine the interlocking functions of different capitals to produce synergistic benefits for livelihoods and building livelihood resilience for ameliorating adverse situations. Based on the more inclusive theories of 'entitlement' and 'capability deprivation' put forward by Sen (1981, 1985, 1999) and an expansion of these by Murthy and Rao (1997), I also argue that livelihoods and poverty in the fishing villages are an interlocking function between the holding of numerous capitals, exchange entitlements (the deprivation faced by fishers in the marketing of the produce), and human entitlements (covering basic aspects of survival needs as human beings). Thus poverty in

the fishing villages can be viewed as the manifestation of the acute lack of entitlements to fulfill basic services for mere survival (Deshmukh-Ranadive and Murthy 2005).

In the analytical framework (Chapter Three), it was mentioned that contemporary models on livelihoods put the emphasis on asset pentagon comprising social, natural, financial, physical and human capitals. In my modified framework, I also added political and cultural capitals for grasping more comprehensive perspectives, particularly in terms of entitlements and traditions of fishers (see Annex 5C plates). It is difficult to find a suitable Bengali word that captures the holistic view of capitals- financial, natural, social, human, cultural, political and physical. Commonly used words like '*sompotti*', '*sohai-sompotti*', '*punjee*' and '*muldhon*' mainly refer to readily saleable properties like land, gold, pond, household goods, trees and livestock. Political capital is rather indicative, in the fisher's interpretation, of 'political networks, lines or connections'. Cultural capital appears as an integral part of the socio-cultural construction of indigenous knowledge. A summary of the capitals is furnished in Appendix 2.

Individuals or households hold these endowments in different degrees that usually determine their capabilities and social positions, and *vice versa*. In this chapter, human capability as a concept is used to mean peoples' ability to lead lives they have reason to value and to augment the substantive choice they might have. Sen (1999) argues that human capability plays a more influential role in conveying the desired level of social changes (going well beyond mere economic changes) and serves as the means not only to augment economic production (to which much of the perspectives of human capital usually refers), but also to the process of social empowerment, and thus the concept is accumulative in character and goes far beyond the notion of human capital alone.

Applying the theory of entitlements of Sen (1981, 1990, 1997) to the livelihood framework, it can be asserted that poor people's capitals not only contribute to the strategies of making livelihoods, but also add positively to enhancing capability, social dignity, empowerment and resilience, and more importantly, to transforming the *de jure* rules of natural resource management on which they depend on and arbitrating the conflicts at the local level. This is how we get a notion of 'rights for access to resources' that helps us understand the way in which poor people deal with poverty in a material

sense, and also the ways how common people transform their capabilities for bringing positive changes towards their quality of life and develop their bargaining power to confront the cross-scale attributes that produce poverty (Bebbington 1999). From this point of view, it is important to understand 'the economic, social and political relationships and transactions that create poverty and wealth in such a way that comprehends these relationships as potentially contingent and subject to renegotiation' (*Ibid.*: 2022). Especially for the resource-dependent communities like artisanal subsistence fishers, the entitlement for accessing the natural resource is the most important determinant of livelihood strategies and outcomes.

Here follows a detailed analysis of the status and use of multiple capitals by the fishers of floodplain and coastal ecosystems. The capitals are inter-twined in their relationships and hence, sequencing in order of priority becomes difficult and odd. However, in other contexts, the significance of the different capitals becomes apparent with differential credence. Showing respect to the *emic* view of capital, I will analyze the issue of financial capital first to show the level of grim poverty. I will provide special treatment to the indigenous knowledge capital considering its importance in the fishing profession. In Chapter Four, I examined the social institutions and local leadership patterns. In this chapter, the focus will concentrate on how the fishers use their social relationships in making livelihoods.

## **5.2. Financial capital**

Classical economists view financial capital as funds (comprising stocks, bonds, money and government securities that are termed as paper assets) that are used to produce real capital (Pearce 1986). The DFID Livelihood Program defines financial capital as 'the financial resources that are available to people and which provide them with different livelihood options' (source:[http://www.smallstock.info/issues/sust\\_liv.htm](http://www.smallstock.info/issues/sust_liv.htm), accessed September 2008). It also refers to the economic or productive capital comprising physical goods that assist in the production of other goods and services (e.g. fishing boats for fishers, tractor for farmers) or any liquid medium/mechanism that represents other forms of capitals. It is of special interest because it is generated by the production process itself, can be reinvested in any other type of capital and is highly mobile (Rudd 2004).

In this section, I will examine the distribution of fishing equipment, land and other properties and income from fishing. In fishing villages where the operations of savings institutions are extremely limited, fishers often hold or convert savings in other forms exchangeable material assets. Hence I will consider a few physical and natural assets (land, livestock, etc.) under this particular category. Fishers consider financial capital as the most powerful capital for their livelihoods. Obviously, in the context of financial capital, a minimum flow of monthly income is important for all families, with the corollary being that fishers falling below the economic equilibrium with extremely low levels of income do critically risk not only nutritional deprivation but also their familial and social standing.

As detailed in section 6.2.3 of Chapter Six, fishers' income is highly dwindling. There are good seasons and bad seasons for income. It varies from US\$ 1-50 and 0.3-5 in bad and good seasons for coastal and floodplain fishers respectively (Table 6.5). There are several combinations of salary and wage systems. For the category of fishers who are hired as paid laborers get the following range of salary from the boat owners for a period of 6-7 months (figures in US\$): Helmsman (*Majhi*): 450-1350; experienced laborer (*agar gaor*): 300-480, laborer (*Gaor*): 127-300; engineman (*Karigor*): 225-300; and cook (*Baburchi/bosti*): 150-180 (source: FGDs and case studies with fishers, 2006). However, the boat owners bear expenses for meals and raw tea. The leaseholders of 'Jollar beel', 'Kotali beel', 'Digha beel' and 'Chatla beel' in the floodplains employ some experienced fishers from Volarkandi village for 3-4 weeks long intensive fishing; they receive payment of US\$ 1.5-4 per day.

Most of the active fishers of the coast do not have fishing gears; most of them end up as paid laborers in boats of others. This is reflected in the ownership pattern of fishing equipment, the very basis of earning a livelihood in the fishing villages. From Table 5.1, it is evident that estuarine and marine set bag nets still dominate in the Thakurtala village, while gill nets coupled with illegal monofilament nets dominate in the case of the Volarkandi fishers. In the case of Volarkandi, around half of the households and 100% of the active fishers own fishing gear and crafts. Gear and crafts used in the floodplains are cheaper as these are relatively small in specifications. The ownership of a higher number

of small boats (62%) in the floodplain areas is attributed to the perpetual dependence on small boats both for fishing and rural transportation during floods.

**Table 5.1: Ownership of fishing assets by Thakurtala (C) and Volarkandi (F) fishers**

Main fishing gear	% of HHs		Value/unit (US\$)*	Boats	% of HHs		Value(US\$)*
	C	F			C	F	
Estuarine/marine set bag net	37	-	90-450	Small to medium non-mechanized	19	8	120-300
Small to medium mesh drift gill net	5	-	150-250	Small/ medium sized mechanized	9 (5-22HP)	3 (2-6hp)	220-770
Hook and long line	2.5	5	0.2-0.3	Small <i>kosha/ dingi</i>	-	62	75-125
Push net	5	5	3-8	<i>Note: Though cast nets usually represent seasonal or recreational or subsistence fishing in floodplains, fishers of Thakurtala use them around the mangrove forests for their daily earnings. Small cast nets in a different mode of operation are seen to be pulled by young boys and girls. In the floodplain, it is difficult to ascertain who is fishing for consumption or subsistence. Fishers usually keep a few fish for familial consumption. Subsistence fishers sell the rest of the catch for livelihood subsistence.</i>			
Traps	2.5	7	0.6-1.2				
Cast net	4	3	10-15				
Small gill net	-	12	30-110				
Current net	-	13	15-45				
Encircling net	-	3	300-800				
Lift net	-	3	30-75				

\* The values of gear and crafts are largely determined by the specifications, constituents (timber type and quality for crafts, the horse power of engines), numbers (in case of hook and long line) and years of use.  
Source: Socio-economic survey 2005

Table 5.2 reveals the ownership pattern of valuables in the coastal and floodplain villages. A dismal picture of landlessness is vivid in the coastal village. Taking together the absolute or functionally<sup>1</sup> landless groups around 85% households are landless, compared to 38% in the floodplain village. Being positioned in the vicinity of a tourist zone, the price of land is much higher in the coastal village, and this is why poor fishers cannot afford to buy land for familial expansion. As an adaptation to the land crisis, parents and grandfathers tend to keep their ancestral land under their control and usually allocate land belatedly.

There is no access to government-owned *Khas* land in the case of the coastal village. Around 16% of floodplain fishers do not have any legal homestead land; they live either on *khas* land or at the mercy of others. A fair portion of these landless groups depend on sharecropping/renting/leasing by the wealthier groups of the same or neighboring villages. Terrestrial agriculture in the *haor* area is predominantly manual (ploughing by cows/buffalo) and any use of machinery is rarely observed. One husking

<sup>1</sup> Absolute landless are those who have no land at all; functional landless are those who have no arable land except small homestead area.

machine is in use in Volarkandi village, thus relieving the women of the manual labor for husking.

**Table 5.2: Distribution of land and other valuable properties (1US\$= Taka 65)**

Valuables	Area/no/unit	% of HH No.		Value (in US\$)
		Coastal	Floodplain	
<b>Arable land</b>				
Absolute landless	-	16.6	5.0	-
Functionally landless	1-4 decimal	69.2	33.3	75-450
Land ownership excluding homestead area	5-25 dec.	8.9	41.6	450-2250
	26-50 dec.	3.8	11.6	2250-6000
	51- 100 dec.	1.3	6.7	6000-13,500
<b>Agricultural equipment</b>				
Plough, spade and harrow	1-3 units	1.3	13.3	
Husking machine	1	-	1.6	450
shallow well	1	-	1.6	150
<b>Other materials (non-agricultural)</b>				
Simple equipment for Wood handicraft /masonry/ sewing	1set	2.6	5.0	15-45
<b>Livestock (multiple sets of animals)</b>				
Cow	1-5/HH	8.9	38.3	30-420
Buffalo	1-3/HH	-	8.3	45-260
Goat	2-9/HH	11.5	18.3	15-150
Duck	3-7/HH	21.8	15.0	1.5- 12
Pigeon	3-10/HH	15.4	5.0	1.5-8
Chicken	2-10/HH	-	15.0	1.5-8
<b>Transportation means</b>				
Rickshaw/ bicycle	1/HH	3.8	5.0	90
Boat	Usually 1/HH		55.0	30-110
<b>Domestic valuables</b>				
Bed	1-2/HH	16.6	26.7	30-120
Clock	1-2/HH	11.5	21.6	3-8
Radio	1/HH	50.0	8.3	2-5
TV	1/HH	2.6	8.3	75-300
Furniture	1-5/HH	8.9	21.7	20-525
Other		2.6	11.7	
<b>Pond/haor waterbody</b>				
Joint ownership	1-3	1.3	5.0	600-900
Long-term lease of water body (Beel)	1, <20 acre		1.7	
Temporary lease	1 <20 acre		1.7	

Source: Field survey 2005

In both villages, >50% of the households own single or multiple sets of poultry and livestock. Thakurtala villagers are widely restrained from rearing cows because of the scarcity of land for sheltering of the animals. They do not rear chickens in their homesteads because of the taboo that litters drive away 'Laxmi' (Goddess of wealth). Domestic valuables are rare in both the villages; only the rich and those having dowries keep some furniture. Sofa sets or chairs symbolize wealth and power; poor fishers are not usually allowed to sit on a sofa or chair when they visit rich men's houses. Fishers were hesitant and unwilling to provide authentic information on valuables like gold, cash and bank savings for security reasons.

From my intensive case studies, I found that most of the fishing families have no or insignificant amounts of gold and rarely do they have any savings in the bank. Televisions are occasionally switched on (using rechargeable batteries) for watching movies, dramas, and football, and rarely used for news and weather forecasts. Villagers are usually allowed to sit together on mats in the open yard of the owner of TV. Poor fishers in both villages believe rich people keep the 'money and gold' hidden in a hole under the mud inside the house. Two fishers of Volarkandi who managed to get possession of small beels through the CNRS (Center for Natural Resource Studies) and CBFM-2 (Community Based Fisheries Management) project, leased out the waterbodies to outsiders ignoring the opinions of other committee members. There is only one pond each in study village and those are widely used for washing, bathing, fish culture and observance of rituals. The pond water gets contaminated as the water-level draws down in the dry season.

### ***5.3. Social capital***

Social capital is defined as 'the web of social relationships that influences individual behavior and thereby affects economic growth' (Pennar 1997: 154). The very basis of this particular capital is the maintenance of societal relationships and values that connect individuals into a functional larger social group. From the view point of sustainable livelihoods, social capital captures the idea that upholding the values of social norms, bonds, attitudes, responsibilities, a culture of reciprocity and mutual trust, and collective action embedded in societal relations and institutional arrangements serve up important roles. It is argued that the more linkages, the better; two-way relationships are better than one-way relationship; and linkages subject to regular update are generally better than historically-embedded ones (Pretty 1998, Pretty and Ward 2001). It is often viewed as having a beneficial effect on the capacity of individuals to organize themselves effectively for their well-being (Coleman 1990, Fukuyama 1995). It is very contextual and differentially owned by members of a society, thus producing dissimilar outcomes for different individuals in different places. Together with leadership capability, it is often considered crucial for the initiation and maintenance of environmental conservation and management at the community level (Olsson et al. 2004, Ostrom 2005, Pretty 2003, Pretty and Smith 2004; *cited in* Bodin and Crona 2008).

At the micro-level of individuals and communities, social capital can serve three functions: as an asset that can be used for either 'bonding', 'bridging' or 'linking' (Krishna 2002, Woolcock and Narayan 2000). Bonding results when strong intra-community ties offer kin and communities a sense of identity and place; bridging results when communities maintaining diverse inter-community ties are in a stronger position to confront problems and take advantage of economic opportunities; and linking refers to the capacity of community members to gain access to decision-making process at multiple layers (*cited in* Rudd 2003: 115). Its role in natural resource management is widely recognized (Ostrom 1990, Jodha 1991, Pretty 1998, Pretty and Hine 2000, Pretty and Smith 2004). Coleman comments that an especially important form of social capital is the norm, so one should combine self-interest and the interest of the collectivity (Coleman 1988: 104). To solve the open access problems and make collective actions possible for natural resource management, social capital is widely perceived as generally agreed institutional solution that the communities develop in the context of their local realities. However, social capital might not be necessarily supportive to the welfare of poor; it may be more positive to some while impacting others negatively in the same community.

Unlike other capitals, social capital is rather intangible and a value-oriented cementing force that many individuals use and maintain as a refuge or safety net for coping with adversities. Making the best use of the brokerage opportunities is reflective of the household's capability of maintaining relationship with different actors, institutions and power sources, thus adding to household's standing inside and outside the village. *'Social capitals while not all things to all people, are many things to many people'* (Narayan and Pritchett 1997:2). It constitutes social relationships which come into existence when individuals try to make the best use of their individual resources (Coleman 1990: 300). Interestingly, the functioning of the NGOs and micro-credit institutions of the country are strongly grounded on this social capital base of the poor, especially women. The concept of self-help groups advocated by NGOs manifests the truth that borrowers' mutual social ties are important to lenders as collateral or guarantee for loan management.

The question arises: is social capital homogenously distributed across members of the fishing villages? The answer is 'no'. Within the broader frame of '*shomaj*' (literally society), fishers interact in a different manner to serve their social and economic interests. In Thakurtala village, apparently the whole fishing community is a '*shomaj*' under the leadership of the 'village *sarder*' (details provided under section 4.4.1 of Chapter Four), but underneath, there is the existence of several fragmented small hamlet-based *shomaj* such as: original inhabitants versus newly migrated villagers, lineage-based *shomaj*, and economic hierarchy-based *shomaj* determined by ownership of crafts and gear. In the floodplain village also, there are hamlet based *shomaj*. The remittance-earning families themselves form a small *shomaj* that interact on non-fishery related economic issues like assistance in procuring visas<sup>2</sup>. There are again project (CBFM, CWBMP) beneficiaries who also form small *shomaj* with demonstrated powers of networking with government agencies and NGOs. The small faction of the Hindu inhabitants of Volarkandi village itself forms a separate *shomaj* for their socio-economic interactions and observance of rituals. Beyond kinship relations, the fishers conveniently interact within other cross-scale entities for their socio-economic interests, livelihoods and conflict management.

It is important to examine how the individuals utilize social capital as a means of survival strategy within the gamut of both friendly and exploitative structures in and around the community. The case study on Nirala Jaladas (section 6.3, Chapter Six) shows how important it is to maintain close relationships with villagers as well as outside well-wishers. Another case is 'Nurul Islam' (a recently converted Muslim) of Volarkandi village who made the best use of social capital to keep his seasonal business of 'cow ranching' well (section 6.4, case 1, Chapter Six). Next to family, support from neighbors is very critical. I found, especially in Thakurtala village, there are day-to-day exchanges of materials like curries, rice, firewood, oil and spices among the neighbors. Such unique exchanges, despite the overall poverty-stricken status of the community, are extremely important for the additional and diverse nutrition of the children and for reducing the stress of hunger during the low income period.

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<sup>2</sup> For this category of people, procuring work-permit and visa is a very difficult, time consuming and costly intervention. They have to get clearance from concerned government ministries; some travel agencies do this job on their behalf and they charge a lot in the name of processing. Often, fishing households have to sell land or other valuable for managing visas and work-permits.

The use of social networks for borrowing money is critical to fishers. Table 5.3 reveals that around 35% of inhabitants of Volarkandi village did not require borrowing, which is reflective of a better economic position compared to that of Thakurtala. In the 'no loan' group of Thakurtala, there are extremely poor villagers including beggars and a few rich families. Rich families with fishing businesses are connected to bigger moneylenders or companies to safeguard their enterprises. The grounding of a strong social network is also important for receiving loans from NGOs, as the NGOs devised the technique of using 'peer group pressure' for the collection of outstanding loans from target groups. The most needy families lack the social capital to reach NGOs, as other group members also avoid them as 'presumed defaulters' when the question of inclusion and loans from NGOs come forward.

Development projects play a significant role in building relationships with NGOs. Islam and Dickson (2007) claimed that the CBFM-2 project beneficiary households had a 273% increase in the amount of credit from 'interest-free' sources that might be used for mitigating short-term crises. This indicates that members of the village organizations have become more trusted in lending and borrowing at the village level. However, it is observed that NGOs as micro-finance institutions have been able to compete with the moneylenders in the coast, but have not been able to replace the moneylenders' role because of their deep-rooted social ties alongside the exploitative roles.

**Table 5.3: Sources of loan critical to livelihoods and business** (multiple answer options) (1US\$= Taka 65)

Sources of loan	Range of loan (US\$)	Interest rate/yr.	Households		Duration (months)	Uses of loans by households
			C	F		
No loan	-	-	8.9%	35.0%	-	-
Relatives/ friends	8-110	-	24.3%	21.7%	1-6	Net/traps/hooks purchase, consumptions, boat repair, treatment, education
Neighbor	5-30	-	17.9%	8.3%	1-3	As above
Boat owner	30-110	-	11.5%	1.7%	1-5	Consumptions, dowry, treatment
Moneylender /companies	45-500	96-120%	34.6%	1.7%	3	Boat repair, gear purchase, fishing operations, dowry
NGOs	30-150	32-40%	37.2%	25.0%	12-24	Domestic consumption, house repairing, familial crises, fishing operations
Banks/other	-	-	-	-	-	-

Source: Field survey 2005

Table 5.4 summarizes the level of participation in different socio-political institutions. There is a certain impetus of development efforts in building social capital

among the poor fishers. The existence and functioning of Village Organizations (VOs), as catalytically persuaded by the UNDP-funded ECFC (Empowerment of Coastal Fishing Communities for Livelihood Security) project in Thakurtala village, provided a different dimension to the cohesion of fishers and fishing villages. These VOs proved very useful in establishing networks with the power sources of local governments of the island. Conscious efforts were made towards making fishers realize their own potential, regaining their confidence, and finally inspiring them to think and walk along their development path of their own. There was a high level of understanding among the beneficiaries that unity is the source of power of the poor. They gained the capacity to meet, sit and discuss their issues freely with the Union Parishad leaders, officers of the *Upazilla* administration and various development departments, especially those who mattered in their development process.

**Table 5.4: Level of participation of fishers of Thakurtala and Volarkandi villages in socio-political institutions**

Thakurtala		Volarkandi		Remarks
Types	No. of persons & level of response*	Types	No. of persons and level of response	
ECFC-VOs	117, active 71, medium 33, inert 13, female dominated	Mosque committee ( <i>Panchayet</i> )	11 (active), absolutely male	Participation level is affected by off-village labor engagement for livelihoods. Fishers of Thakurtala village usually set meeting dates with respect to lunar tides and lean fishing periods in the month.
NGO groups	52 (active 18, medium 27, inert 7), female dominated	Primary school committee	1 (active), male	
Project management committees	23 (active 14, medium 9); around 60% women	CBFM committee	23 (active 5, medium 7, inert 11); ornamental inclusion of 2 women	
Hamlet-based committee	3 (active 3), all male	UP member	1	
-	-	NGO groups	65 (women dominated)	

\* Response level is calculated from the attendance register maintained in the fortnightly meetings of the village organization (active=80-100%, medium=50-80%, inert= <50%)

While social capital is an important asset for fishers, deprivation from the capital or social exclusion is threatening to the poor fishers' livelihoods. Social exclusion eventually culminates in economic exclusion as fishers fail to exercise their right over common property resources. Cases of caste and ethnicity-based social marginalization are also reported by some scholars. Harkes (1993) mentions that in the Yaere floodplain of Cameroon, the *Kotoko* ethnic groups (settled in the floodplains in 15<sup>th</sup> century) used to

seclude the *Mousgoum* groups (settled at the beginning of 20<sup>th</sup> century) using barriers. Kremer (1994, cited in Bene 2003: 963) mentioned that Muslim fishers ('*maimal or Motshojibi*')<sup>3</sup> often act collectively to prevent Hindu fishers ('*nomosudra*')<sup>4</sup> from other villages from fishing in certain areas of flooded agricultural land through physical violence and stealing gear.

I investigated one case related to institutional exclusion from basic rights. The Hindu *Jaladas* fishers of Maijghona village, Chakaria, Cox's Bazar have been fishing in the tidally influenced '*Bura Matamuhuri*' river for generations using ESBNs (Estuarine Set Bag Nets) through an arrangement called '*faar*', locally managed by social leaders ('*Sarder*') using the technique of lottery (the management system is detailed in Chapter Seven, section 7.4). In the 1990s the area was brought under shrimp culture by the locally powerful Muslims who, as rich landlords, maintained herds of buffalo also in the nearby tidal flats. Accidentally while crossing the river, two buffalo were trapped in a set bag net of a Hindu fisher and eventually died. The rich Muslim owner filed a case to the local administration against the poor Hindu fisher for 'murdering buffalo'. The local government administrator fined the Hindu fisher (knowingly he was absent when the buffalo were trapped in his net; usually fishers go to their nets at the end of high tide for collecting fish) favoring the rich Muslim herd owner on the grounds that 'maintaining shrimp farms in the tidal flat areas is more important for the national economy than the mere set bag net fishery'. Thus the fisher's age-old property right to set nets in the socially designated areas was denied officially. The Hindu fisher failed to pay the fine (around US\$ 1500 equivalent to his two years net income) and eventually gave up his age-old fishing profession.

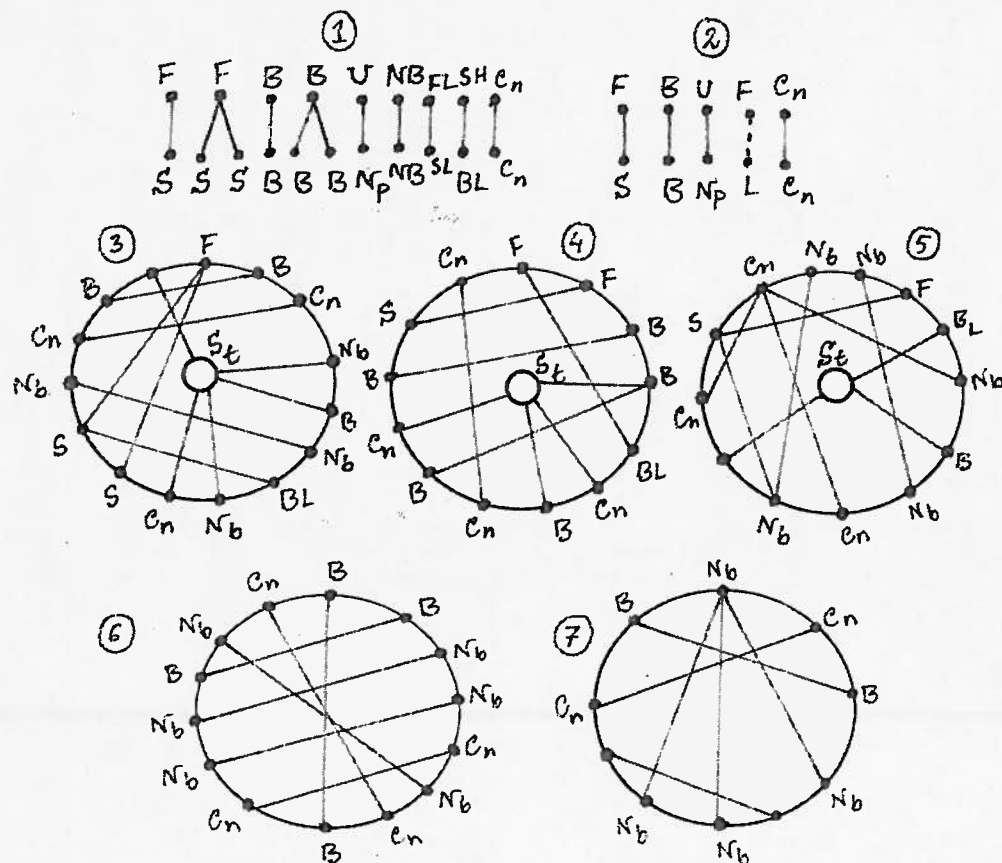
Social capital plays a critical role in determining the social organization of fishing in both coastal and floodplain villages. The social systems that harvest and market fishery products appear to be highly complex and subject to many external influences (Mahon et al. 2008). The fishing operations in the floodplain are mostly (around 90%) limited to the family level operations. However, in the case of encircling gears like '*ber jal*' and big

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<sup>3</sup> My comment: the term '*Motshojibi*' does not necessarily signify a Muslim fishing-based social group, rather it literally covers all fishers and fishworkers that make livelihoods out of fish-related activities

<sup>4</sup> My comment: '*Nomosudra*' is generally used to mean groups of untouchables and 'lower-castes' as per Hindu caste hierarchy; the term does not identify in essence the hereditary fishers specifically

'kapri jal', social capital plays an important role in determining inclusions and partnerships in the fishing team. In the case of coastal non-motorized or small motorized boats, the affinity is mostly confined (around 80% cases) to 2-3 family members with the usual combination of 'father-son' and 'brother-brother' with a few cases of 'uncle and nephew', 'father-in-law and son-in-law', 'sister's husband and brother-in-law' and 'maternal uncle with sister's son' (Figure 5.1). For a small section of the helpless orphans in both fishing villages, recruitment as a laborer appeared important for livelihood. Social capital also plays an important role in finding a job on the fishing boat. For social network analysis (Figure 5.1: 3, 4, 5), I selected three sea-fishing boats from the coastal study site.



**Key:** 1. Coastal area small boat, 2. floodplain area small boat, 3. coastal gill/Hilsa net, 4. marine set bag net (MSBN), 5. coastal hook and long line 6. floodplain encircling 'Kapri' gear, 7. floodplain encircling gear 'ber jal'. F-father, B-brother, U-uncle, Nb-neighbor, FL-father-in-law, BL-brother-in-law, Cn-cousin, Np-nephew, Nb-neighbor, SH-sister's husband, St-Steerer (Majhi).

**Figure 5.1: Kinship analysis of fishing boats of floodplain and coastal areas**

It is evident that out of 16 fishing crews in a gill net boat, 12 crews including the steerer have kinship relations while the four others hail from a distant village of 'Boroghope Kaibartapara', Kutubdia Island. In this case, maintenance of social relations played a significant role in finding the fishers positions as crew members. They were recruited at steerer's influence. MSBN (Marine Set Bag Net) fishers are more tightly linked; out of 14 crews, only two are from another village and the rest are from the same fishing village with some degree of kinship relations among them. In the case of hook and long lines, all crews except two have kin relations.

However, in the case of all sea-going artisanal crafts, it is the steerer's networks and social capital that put tremendous influence in the selection process of fishing crews. In the context of the demographic transformation of Hindu caste-based fisher's dominance to Muslim new-entrant fisher's dominance, there are simultaneous changes in the pattern of crew composition. Earlier in the case of Muslim-owned fishing boats, the chiefs or steerers were selected from the Hindu fishing community but that port-folio has now been mostly taken over by experienced Muslim fishers. A few Hindu *Jaladas* fishers are employed so the novice Muslim fishers can learn their inherent techniques with practical hands. One Hindu fisher adds with anguish:

*'We are like 'surrogate' fishers; we are hired by the Muslim boat owners for our superior fishing techniques, experience and loyalty. Once the techniques become known to other Muslim fishers, the owners do not hesitate to employ their own relatives kicking us out. Social relations and religious affiliation get preference in the process of recruitment. Some of us, however, still survive because of our good relations and loyalty' (Kalipada Jaladas, 56, Boroghope, Kutubdia Island).*

#### **5.4. Human capital (Indigenous Knowledge capital)**

*'Monre krishi kaj janona; emon manob jamin roilo patita, abaad korle folto sona' (Oh my restless mind; you do not know proper agriculture techniques! What a fertile human land remains uncultivated, there you would grow invaluable gold, if properly ploughed' - excerpt of a popular 'Ramprashadi folk song').*

*'Throughout history, all human groups have depended on careful observations of the natural world. If they learned from these observations, they adapted successfully. If they did not, the consequences were probably deadly. Survival is the ultimate criterion for verification of traditional ecological knowledge and adaptation is key. Thus, the practice of indigenous knowledge is, above all, the story of how social/cultural systems adapt to specific ecosystems' (Berkes 2008: 71).*

This section will examine the human capital of fishers with pretty detailed exploration of the Traditional Ecological Knowledge (TEK)<sup>5</sup> of fishers. Human capital is the total capability embodied in individuals that reflects the stock of individually possessed knowledge, experience, competencies, education and skills that help them increase personal, economic and social well-being (Helliwell 2001, *cited in* Rudd 2004: 114). It cannot be separated from individuals in the way they can be separated from their financial or physical capitals. Both the 'Chicago school of economic thoughts' (Becker 1993) and the welfare economists (Sen 1985, 1990) view human capital as means of production, and argue that one's productive outputs depend partly on the 'rate of return on the human capital' one owns. Sen (1997) remarked it helps people to produce more, and gives them the capability to engage more fruitfully and meaningfully with the world. Traditional ecological knowledge, comprising 'Knowledge-Practice-Belief complex' (Berkes 2008) can be viewed as specific human capital because the skills, knowledge and experience of fishers are utilized as a means of production.

An examination of human capital is especially important for coastal fishing because fishing operations inevitably entail a broad mix of knowledge covering traditional navigation and people skills, as well as a thorough understanding of fish behavior, ecosystem attributes and risk management. The 'skipper effect'- a persistent differential in catch rates over time- has been shown to be related to human capital proxies such as age, education and fishing experience (Kirkley and Squires 1999, *cited in* Rudd: 114).

My line of argument is that the knowledge base contributes significantly in the decision-making process adopted by fishers for maximizing their harvests. Fishers are not hunters targeting an animal; rather they combine a set of observations and underlying principles prior to making a decision for fishing. Grant and Berkes (2007: 169), exploring the folk oceanography of the longline fishers of Grenada in the eastern Caribbean, comment that the fisher's expert system is a *'useful lens to understand how fishers operate with a knowledge base, an inference engine, and a user interface. Fishers*

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<sup>5</sup> Viewing Traditional Ecological Knowledge (TEK) as a 'knowledge-practice-belief complex' and a subset of indigenous knowledge, Berkes (2008:7) defined TEK as *'a cumulative body of knowledge, practice and beliefs, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment'*.

contribute their experience and observations to a cumulative pool of knowledge, and use heuristic rules (IF this THEN that) to make decisions'. This critical decision-making process especially matters in the sea, and experienced fishers have perfected their knowledge base on important environmental parameters. As the knowledge base is found intensely influenced by the immediate ecosystem and fisheries resources, I will analyze separately the distinct and diverse knowledge system of the coastal and floodplain fishing communities in this section.

First, I will discuss the condition of formal education in the fishing villages. Education is important for the enlightenment of the fishing communities. Taking a more encompassing human capability dimension, Bebbington (1999: 2034) aptly mentions the individual's ability to read and write not only enhances likelihood to secure better jobs and perform more efficiently- it also enhances ability to 'engage in discussion, to debate, to negotiate, to add their voice to the multitude of voices influencing household, local and national discourses on development and other issues'. As shown in Table 5.5, literacy<sup>6</sup> is around 56% and 43% in Thakurtala and Volarkandi villages respectively. If we consider the leftout cases from primary schools on the top of the figures, then an alarming rate of >70% villagers are illiterate (73% male and 79% female in the coastal village, and 74% male and 89% female in the floodplain village respectively), compared to a 45% literacy rate at the national level (male 50%, female 41%). Most of the literate respondents attended primary schools for around 2 years only. Though primary education has been made compulsory, and education for girls up to the secondary level is financially supported by the government, enrollment rate falls below the expected level.

**Table 5.5: Distribution of fishing population by level of education (figures in %).**

Level of education	C		F		Remarks
	M	F	M	F	
Illiterate (can't read or write)	39	49.5	51.6	63	One teacher of Volarkandi village with a Bachelor of Arts (B.A.) degree was not covered in the survey.
Primary education incomplete (<class 5)	34	30	22.4	26.5	
Primary education completed (class 5 pass)	12.5	15.5	10	7	
Secondary education incomplete (class 6-10)	8.5	4	5.5	3	
Secondary education completed (SSC pass)	4	1	4.5	0.5	
HSC failed	1	-	3	-	
HSC passed	0.5	-	2	-	
Graduation incomplete	0.5	-	1	-	

Source: Field survey 2005. Legend: C= coastal village, F= Floodplain village

<sup>6</sup> Literacy is assumed here as the ability of putting signature and doing basic numerical assessment irrespective of attendance in the formal and informal educational institutions.

Within a fishing village, there is sharp stratification among children hailing from different 'economic backgrounds'. In the coastal fishing village, sons and daughters of the extremely poor 'fishing laborers category' attend around 35% and 42% less classes compared to those whose fathers own engine boats and land property (source: based on analysis of attendance registers and wealth categorization of students, June 2006). This happened because of child-labor utility in land and shore-based fishing activities like shrimp fry catching, fish segregation, and cleaning and working on near-shore boats. Some parents are reluctant about the education of their daughters due to the fact that grown-up girls might become victim of sexual assault (by local thugs) on their way to schools, and such unwanted incidents might affect the social marriage of the girls in future. Many old fishers believe education has little relevance for a profession like fishing. It did not appear to me that formal education has contributed to the economic upliftment by making access possible to non-fishing related jobs in either of the studied villages. This is attributed to the fact that the level of education these young fishers have is not enough for good jobs, and more importantly they widely fail to access the 'power sources'<sup>7</sup> of jobs with their limited social identity and political connections.

There is no strictly religion-based educational institution in the Hindu fishing village 'Thakurtala', nor are there any stringent social regulations for imbibing religious lessons in childhood. Children attend a project-supported community managed school (up to grade 3) in the village; after that some of them attend the government primary school located on the top floor of a cyclone shelter. However, in the Muslim fishing village 'Volarkandi', there is the existence of both government primary school and mosque-based '*madrasha*' for imparting religious education. Children in the Volarkandi village go to the priest '*Imam* or *moulana* of the *madrasha*' when they are 3-4 years old; then many of them eventually get admitted to primary schools. In the mosque, the *Imam* recites from the '*koran*' and the students follow him loudly. Huge numbers of children is managed by whipping them on the back, when necessary, with a 'cane stick'. I observed

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<sup>7</sup> There is a popular expression '*mama-bhagina*' (literally maternal uncle and sister's son) in the wider Bengali community; '*mama*' symbolizes elites like government bureaucrats, political leaders, members of the parliament, ministers, etc., while the '*bhagina*' represents the close relatives of these aforesaid power houses, sycophants, political activists, moneyed men ready with bribes etc. Very often, getting a chance in the public job sector is determined by this crucial '*mama-bhagina*' relationship of nepotism and favoritism.

the villagers are generally more inclined to formal primary education rather than the mosque-based religious education. The reason is mainly economic. Muslim fishers mentioned the employment of the '*Imam/Moulana*' for maintaining a decent living is extremely limited. In the following section, I will analyze the TEK (Traditional Ecological Knowledge) in details.

#### **5.4.1. Indigenous knowledge capital**

Scholars from multiple disciplines have started exploring people's knowledge for fulfilling numerous development objectives (Ostrom 1990, Bromley 1992, Johannes 1998, Grenier 1998, Berkes 1999, Sillitoe, 1998, Usher 2000). This vast esoteric TEK capital to be translated practically for fisheries management and development planning (Johannes 1982, 2002; Neis et al. 1995, Warren et al. 1999, Grenier 1998, Berkes 1999, Mathooko 2005); TEK is increasingly viewed as a legitimate source of information for participatory management (Dyer and McGoodwin 1994, Neis 1992, Neis and Felt 2000, Berkes et al. 2001). The FAO (Food and Agricultural Organization of the United Nations) Advisory Committee on Fisheries highlighted the potential usefulness of local and traditional knowledge in fisheries from the broader ecosystem framework and for the development of appropriate resource conservation methods (FAO 2000). Impressive practical results about fish stock, migration and spawning have been obtained from the use of IK for fishery development in the lower Mekong basin, which is also a floodplain area (Valbo-Jorgensen and Poulsen 2001, Mekong River Commission 2001). Baird (1999) describes how the TEK of the Mekong basin fishers played an important role in framing management regulations under 'village laws', monitoring fisheries activities and adapting management regulations to meet local conditions. Here the TEK of fishers is examined separately considering the distinctiveness of floodplain and coastal ecosystems.

##### **5.4.1.1. TEK of the floodplain fishers**

The *haor* fishers have the advantage of taking decisions easily based on their direct observations. Shallow depths and easy operation of the gear make their lives easier in the *haor*. The wetlands are characterized by huge rainfall water in the monsoons and back flow from adjacent rivers and streams. In the early monsoon, frequent flooding carries away a considerable amount of highly productive silty water. The flood waters begin to

recede by October, and a peak lean period in water column corresponds to February-March. Within a basin-shaped geographical boundary, *haors* characterize a magnificent interface between sporadic distribution of uplands popularly known as '*kanda*' and water (Figure 7.1).

**Color:** Fishers observed that the nutrient loads/turbidity of the water, precipitation, geographic location, seasonality, depth and 'fish food' (phytoplankton, zooplankton and benthos community structure) are very important in determining the water color. The monsoons with their flash floods generate a big turn in the overall change in water color in upstream areas initially, followed by downstream areas. Fishers generally agreed there are distinct variations in taste of different species harvested from different waterbodies; fish caught from specific beels bear extra values to buyers (Table 5.6). Fishers believe that variation in taste might be attributed to 'water quality, mud type and fish foods'. This issue on test variation of fish deserves a detailed scientific study.

**Table 5.6: Waterbody recognized as famous for specific fish**

Waterbody (Beel)	Fish
Jollar, Ghataura, Padma, Chowdhala	Rui ( <i>Labeo rohita</i> ), Catla ( <i>Catla catla</i> ), Mrigel ( <i>Cirrhinus mrigala</i> ), Ayre ( <i>Mystus aor</i> ), Kalighonia ( <i>L. calbasu</i> ), Chitol ( <i>Notopterus chitala</i> ), Boal ( <i>Walagu attu</i> )
Malam, Mochna, Pinglar, Chinaura	<i>M. aor</i> , <i>W. attu</i>
Chinaura	<i>W. attu</i> , <i>Heteropneustes fossilis</i> , <i>Clarias batracus</i> , <i>Mystus</i> spp.
Chatla, Kukurdubi, Katua	Pabda ( <i>Ompok</i> spp.)
Balijuri, Lamba, Medha, Mochna	Puti ( <i>Puntius</i> spp.)
Naad, Padma, Jollar	Chitol ( <i>Notopterus chitala</i> )
Kuiachori, Ranchi, Tural, Baddakuri	Batashi ( <i>Clupisoma atherinoides</i> )
Balijuri, Lamba	Sarputi ( <i>Puntius sarana</i> )

Source: Field observation and FGD with fishers of Volarkandi, Hakaluki haor, February 2006.

Fishers identified four types of water: turbid (*Ghola/ghole/maitta pani*), clean (*Saf/dhola/sada/forsha/poriskar/ halka kala pani*), greenish (*Sabuj/halka sabuj pani*) and brownish (*Mora/ badami/ dhan pocha pani*) water. Silt-laden turbid water, predominantly found during the monsoon season, find its place in the downstream *haor* areas following flash floods and spillover effects of major rivers and canals like *Surma*, *Juri*, *Fonai* and *Kushiara*. Fishers believe major carp and large fish breed in the turbidity-rich spillover areas of major rivers. Fish like *Catla catla*, *Labeo rohita*, *Cirrhinus mrigala*, *L. Calbasu*; *Wallagu attu*, *Notopterus chitala*, *Channa striatus*, *Nandus nandus*, *Gagata* sps. and *Mystus* sps. are recorded from turbid waters. Once the flash flood flow becomes stable

and the rain stops carrying silt-rich mud, the silts of the water gradually settles down (fishers term the process of turbidity reduction as 'filtration' or *Chuani*) and the water column turns clear.

Recurrent breeders like small fish and prawns prefer less turbid water for breeding and nursing in downstream areas. In the post-monsoon period, the water gradually turns light green to green. Brown water is usually reported to occur in draw-down areas during pre-monsoon dry period following the degradation of aquatic vegetations and paddy stems. *A. mola*, *Salmostoma* spp., *Chanda* spp., *Puntius* spp., *G. chapra*, prawns, *Anabus testudeneus*, *Heteropneustes fossilis*, *Clarius batrachus*, and *Mystus* spp. are known to be found. It is believed brown water is not suitable for breeding and survival of spawns. Water color is known to have a profound impact on the body color of certain fish. For example, a 'boal' (*Wallagu attu*) growing up in greenish water displayed a blackish to dark greenish 'shoulder' (dorsal region), whereas those caught in less turbid or transparent water displayed a 'yellowish belly'. It is difficult to ascertain whether such color variation is strictly attributed to the variation in water color/habitat, or is there the existence of a morpho-species of the genus.

**Maximizing fish in leased waterbody:** Haor fishers have experimented and developed some techniques for maximizing catches from their own administered *jalmohals* (waterbody) which mirror their sheer observations on local hydrological factors, the ecological requirements, the behaviors of fish and their relative availability in time and space. Fishers know well about the 'emigration of fish' from wider floodplain zone to the deeper water zone at the advent of dry months. Their livelihoods are impacted heavily by the success of the techniques they follow for fish aggregation, and their access rights to certain locations in certain periods.

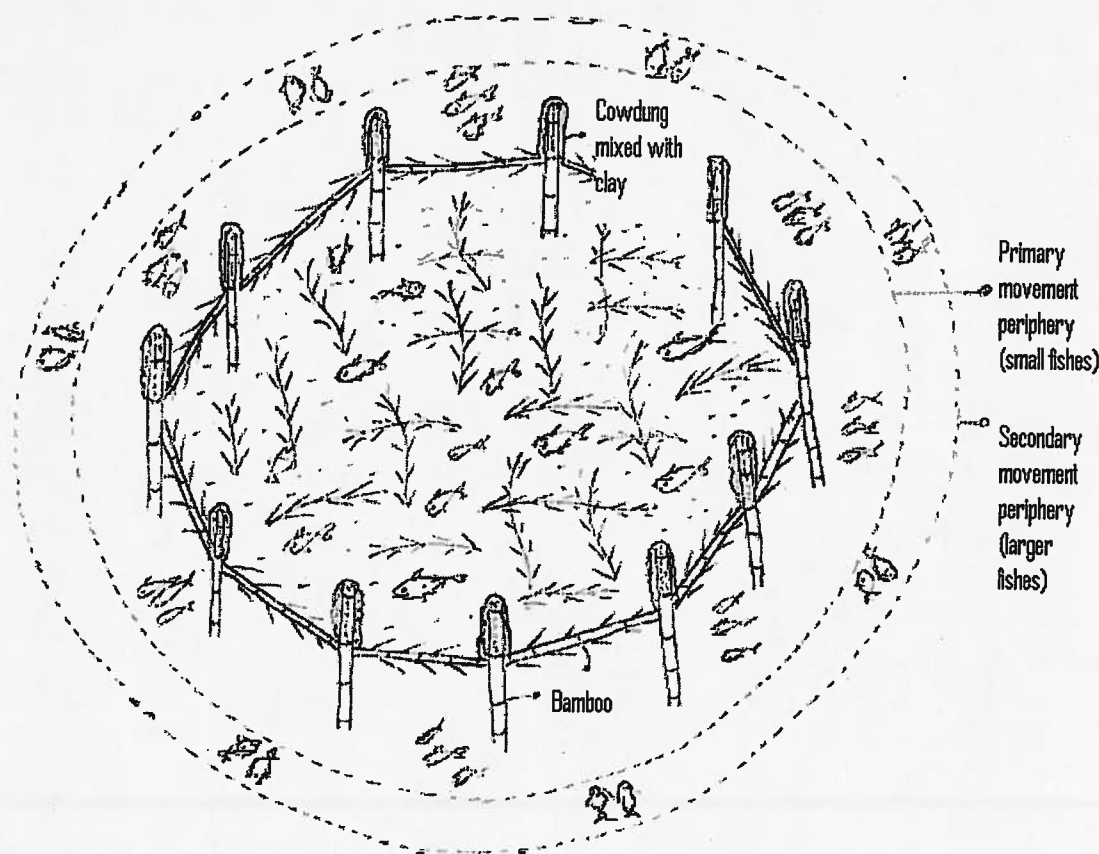
Fishers of Kanungopara in their leased 'Gaimara' (0.76 hecter) and 'Mekri beel' (0.75 hecter) use salt with the supplementary feeds of fish. The fishery officials told them in the training sessions about the importance of providing supplementary feed to the fish (ratio 10 kg oil cakes: 5 kg rice bran: 1kg trash dry fish mixture for each waterbody in the post-monsoon periods, yearly 2-3 times), but the fishers have adapted the practice of using salt additionally as part of their local innovation. Fishers consider salt protects the

fish from 'skin diseases' (to mean 'epizootic ulcerative syndrome'), adds to the longevity of the food in water, invokes dancing movement and aggregation of fish, 'lessens' the foul smell of oil cakes, and creates a 'slightly salty zone' on the surface layer. To avoid the dispersal of fish during monsoon periods, some fishers add stir-fried aromatic spices (like 'kala jira, mouri and 'methi'-*Trigonella foenum*) with a 'food ball' of rice bran and molasses; the strong smell is known to attract fish from surrounding areas. Some fishers use 'gaad' (the byproduct of rice-brewed wine, mainly produced by the local tea garden laborer) with rice bran and then spread on the surface water. The spray area is perceived to be very 'exciting' for fishes. 'So far and so long strong smell of wine-discard passes, fish will be bound to be like intoxicated and crazy' said Sajib Biswas, 39, Pabijuri. Some fishers use 'shidol' (a strong smelly enzymatically-fermented *Puntius* fish) instead of wine discards.

Fishers practice 'brush piling' (*Kantha/ Jharkantha/ banshkhata*) covering areas of 200-1000+ square metres with dried-up branches of water-resistant *haor*-resident species<sup>8</sup>. Huge periphyton grows on the surface areas of the trees and bamboo, and fish dwelling there are believed to grow quickly. *Kantha* is of immense significance from the conservation point of view, as fish of a wide variety aggregate there for food, shelter, breeding and growth. The centre of *kantha* is piled up with more tree branches while the circumference areas are less dense. Thus a low-density 'gate area' to a high-density 'bed area' is created for a diverse category of fish (Figure 5.2). Such a formation of periphery allows fish to roam and feed in a wider area; also fishers retain 'effective control' over the territory. The leasee of the deep perennial waterbody who harvest at the interval of three years believe in the 'back home hypothesis' with the assumption that, fish that grow in a particular *kantha* will return after 2-3 year intervals from the waterbodies wherever they may roam. Such a perception is important from the conservation point of view that fish might get at least one chance to breed.

<sup>8</sup> Water-resistant species like *hijol* (*Barringtonia acutangula*), *barun* (*Crataeva nurvala*), *koroch* (*Pongamia pinnata*), *pani hijol* (*Salix tetrasperma*), *jarul* (*Lagerstromia speciosa*), *pithali* (*Trewia nudiflora*) and also terrestrial plants like tamarind (*Tamarindus indica*), *gub* (*Diospyros peregrina*), *jam* (*Syzygium* spp.), *boroi* (*Zizyphus* spp.), mango (*Mangifera indica*) and bamboo (*Bambusa* spp.). Surface sheds usually include water hyacinth (*Eichornia crassipes*) and 'Guripana' (*Wolffia* spp.). Among all these species, *hijol*, *jarul* and tamarind branches are preferred because of their water-resistance capacity (they are known to not rot for 3-5 years while others last for 1-2 years). I was told by an experienced fisher (Nur Ali, 50, Padma beel) that the external layer (*bakol*) of the *hijol* tree is 'sweet' and attracts fish.)

Some fishers put the mixture of 'silty clay and cow dung' on the top of the bamboo body (around 2-3 feet). As the water column increases, the mixture decomposes and produces plankton. The greenish surface water is believed to attract fish. A group of fishers use electric bulbs at night for a few hours around the vicinity of their houses with a view to attract insects and fishes; insects that fell down on water after being shocked with hot bulbs become easy prey for the fish. Fishers in their small *beels* put 'putidal' (small floating plants) and chopped soft grasses to attract 'grass carp' (*Ctenopharyngodon idella*), silver carp (*Hypophthalmichthys molitrix*) and bighead carp (*Aristichthys nobilis*) from nearby areas.



**Figure 5.2: Schematic diagram of 'Kantha' as fish aggregation device (redrawn from PRA sketch, Volarkandi, April 27, 2006).**

Fishers informed me that common carp (*Cyprinus carpio*) prefer water hyacinth as a medium of releasing eggs and providing refuge that is critically necessary for the small fries. Viscera of slaughtered cows and goats, collected fresh from the local market, are chopped into small pieces and then thrown in *beels* at the proportion of 6-9 kilograms

per every 20 acre *beel* weekly. Dead animals are also thrown in the larger *beels* that are known to increase productivity following decomposition. This practice helps them to avoid burying large animals in the *haor* where land is very scarce. Fishers usually dig a circular or rectangular deep pit (locally called *kua*, *khada*, *gortho*, *donga*) so fish can take refuge during hot days. They put some brush inside to prevent poaching. Some fishers use cow dung at 3-5 kg/decimal/month (1hecter=100 decimals) and poultry litter at 1-1.5 kg/decimal/month for enhancing productivity. They perceive that some fish eat 'cow dung and litters'. Fishers agreed that different aggregation techniques lead to at least a 20-50% increase in fish catch depending on the strategic location of the waterbody, length of application, percentage area of coverage and some hydrographic factors.

**Habitat preference:** The biological cycle of fish and the hydrological cycle is in such a synchronized compliance that with the advent of the rainy season and flood waters, most of the species get ready for spawning. Fishers know well about the significance of certain vegetation for the conservation of fish. I learned from the fishers that small cohorts of a wide variety of carp, berbs and catfish and prawns find refuge and foods attached with leaves and stems of dense vegetative cover of '*Singra*' (*Trapa bispinosa*). Giant leaves of '*Makhna*' (*Euryale ferox*) are an excellent refuge for food, breeding and growth for a wide variety of fish; the medium vegetative cover of '*Panchuli*' (*Nymphoides indicum*) is important for the nursing and growth of small prawns, and free-floating plants (like *Azolla pinnata*, *Eichornia crassipes*, *Lemna* spp. *Spirodella* spp, *Wolffia* spp.) serve as very good refuge for juveniles of major carp, catfish, small miscellaneous fish and prawn. Some emergent amphibian hydrophytes (like *Saccharum spontaneum*, *Phragmites karka*, *Cypertus* spp., *Polygonum* spp., *Typha* spp., *Aeschynomene* spp.) usually found in upstream floodplain areas, uplands, edges of rivers and channels are very important as breeding areas for predators like 'Boal' (*Wallagu attu*), 'Shoil' (*Channa marulius*), 'Gazar' (*C. marulius*), 'Pabda' (*Ompok pabda*), 'Puti' (*Puntius* spp.), 'Pholoi' (*Notopterus notopterus*) and 'Koi' (*Anabus testudineus*). Predatory large catfish (*Wallagu attu*, *M. aor*, *Bagarius bagarius*) release eggs inside 'sandy mud holes' traced on the bed of rivers; snakeheads are known to prefer 'new flood water' for their breeding and the mothers guard their offspring for at least one month.

Small and medium catfish are also claimed to be poly-breeder; fishers informed about the breeding of small catfish usually in April-May and June-July in conformity with the flood water. These fish, like the berbs, are also known to prefer little vegetation for breeding and little to medium water flow and turbidity as triggers. Fishers observed that catfish can breed in any habitat of *haor* where minimum suitable conditions for spawning and survival exist. These fish are mostly '*beel resident species*'. Air breathing fish (*Clarius batrachus*, *Anabus testudineus*, and *Heteropneustes fossilis*) are known to breed in the reeds or swamp forest areas of the shallow beel.

#### 5.4.1.2. TEK of coastal fishers

*'There is a relationship between fishers' hair colors and their knowledge about the sea. You know that a young fisherman with black hair is a learner; someone with some grey hairs has learnt well; and there is no question about the wisdom of one who has most grey hairs on his head.'* Sitaram Jaladas, 56, Thakurtala.

I will examine only a few attributes (among many that I learnt from them) that are considered significant by the coastal fishers in their decision-making process for fishing in the Bay of Bengal, the northern extended arm of the Indian Ocean. Caste-based fishers have developed folk taxonomies about the salient natural features such as water color, waves, winds, depth, currents etc. through decades of their learning actions.

#### *Color of the water:*

*'When a farmer finds his green paddy field is turning yellowish, he decides to harvest. The color of water is, in the sea in the same way, important to us....If you did not ever smell Hilsa mucous from the red water in situ, you are not a fisherman at all.'* Ananda Jaladas, 67, Pourashava Jaladaspara, Sadar.

Fishers mentioned about the presence seven types of water masses from the Bay of Bengal. These are: blackish water, light leaf color water, green coconut or clear water, turbid water, blue water and deep green water. Fishers perceive that the coverage and duration of the existence of certain color water mass are strongly influenced by seasonality, depth zone, topography, fresh water influx, wind direction and velocity, and the semi-diurnal tidal periodicity during the new moon and full moon tidal cycles. The southerly wind brings blue water near the coast, while the northerly wind does not usually affect the water color. With the turbulence of high tide, coastal water becomes muddy while with the receding tide, it becomes bluish.

The blackish water mass (*Kala pani, kali pani, kalma pani, hain pani*) is found past 10-40 km from the shoreline at a depth of 40-50m. Mechanized boats target costly fish like pomfrets, croaker, Indian salmon and red snapper from such a water mass. A light green water mass (*Halka pata pani, halka sabuj pani*) occurs at a 20-30m depth zone during the post-monsoon periods; operators of the MSBN, longline, *Hilsa* drift net target this water mass for numerous small to medium sized fish and shrimp. A reddish water mass (*Lal pani, sindhur pani, Illish pani*; Hindu fishers consider red water as the menstruation zone of the deity Ganga) occurs during post-monsoon periods (6-30m) in some fishing spots (knowingly off the south *Sonadia* Island, south-west of *Hatia Island, Sandwip khari, Meghna khari, Gulitder, Dulachira* of the Sunderbans), well-known for *Hilsa* shoal. Light turbid (*Dab pani, sada pani, saf pani*) and turbid (*Ghola pani, maitta pani*) watermasses are reported from a 1-20m depthzone during monsoons near the shoreline; dominated by operators of ESBNS, MSBNs, beach seine nets, hooks and longlines. A blue water mass (*Nil pani*) is reported from St. Martin Island areas almost throughout the seasons; such water is targeted for Indian river shad *Hilsa*, ribbon fish, pomfrets, croaker, jew fish, Indian salmon and tiger shrimp. One fisherman commented that 'coconut water' (a clear water zone) with high transparency in the middle of the Bay of Bengal is the area where 'cyclones'<sup>9</sup> take birth' (Nilkanta Jaladas, 60, Boroghope, Kutubdia). He asserts '*the clear zone is like 'impotent women; it breeds nothing except cyclone*'. A deep green water mass (*Sabuj pani, Pata pani*) occurs at 10-30m along Sunderbans mangrove areas and is known for a wide diversity of fish and shrimps.

The reddish water zone is specially designated as dwelling areas of *Hilsa* spp. In such water, *Hilsa* is seen occasionally to jump on the surface; once their tails are seen, they dive to middle column of the water. To target the water column, the '*Majhi*' (steerer) slows down his boat to minimize the sounds of the engine; he picks up a bucket of water and smells it. Experienced fishers know that certain types of 'frothy' and little bit 'sticky/thin oily' substances, the typical smell of '*Hilsa* mucous' and 'special type bubbles' caused by '*phaissa*' (*Setipinna taty*) fish are indicative of fish shoal. Fishers cut

<sup>9</sup> Oceanographically, in the central part of the Bay of Bengal, the anticyclone circulation is generated and in the centre of this lies the zone of convergence. Usually this region is characterized by high transparency of water.

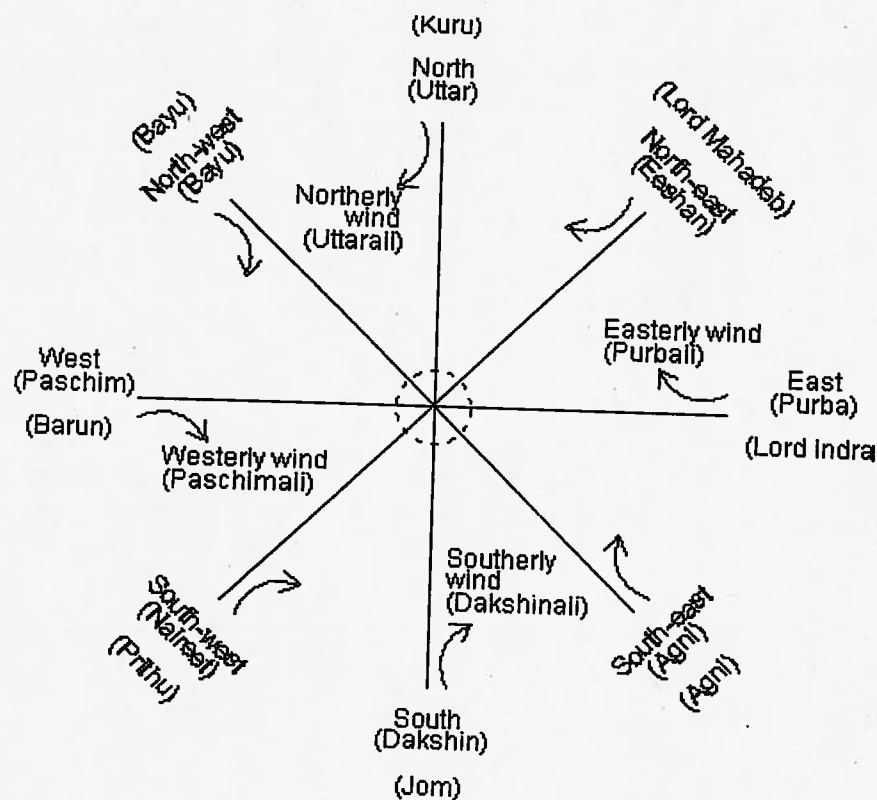
jokes that silvery colored Indian shad 'Hilsa' (*Hilsa ilisha*) and pomfrets (*Pampus argenteus*) 'married two sisters of the same mother' as they are found to roam together. 'Sangam or milon pani' (conjugated water) is also known to occur, especially in the shallow upwelling zone and with the heavy influx of turbid rich flood water, when two separate and distinct colored water masses merge together. A wide variety of freshwater, brackish water and marine water species are found in such interfaces.

**Wind direction and current:** Wind directions and velocity deserve special attention from the fishers. Wind from the north and east-west direction is good for fishers. With the southerly wind (mid-March to mid-July), the sea remains 'angry' (*Gorom*), and only rain diminishes 'bish' (literally poison, here to mean force) of storms and cyclones. Northerly wind (*uttarali*) blows during mid-August to mid-March; after that the westerly wind begins to appear. Fishers reported the easterly wind (*pubali*) appears at night from 10pm to 7 am during *Falgun* (Mid-March); the westerly (*paschima batash/bayu*) emerge by daytime during *Agrahayan* and a few days at the end of February to mid-April. Hindu fishers believe the 'Uttaraly' (northerly wind) takes genesis with 'Janmasthanmi' (birth day of the Lord Sri Krishna); the wind will continue from September to March (*Bhadra* to *Falgun*). Again the southerly takes birth during 'Sripanchami Sarwashati puja' (Sarwassati known as the deity of knowledge) in *Magh* (mid-January to mid-February) and will continue for around seven months with strong effects in March to June (*mid-Falgun*, *Chaitra*, *Baishakh*, *Jaistha* and *mid-Ashar*). In almost all the seasons, the majority of fishers prefer to fish between a depth of 3-20m; this observation combines with the fact that shallow waters are rich in food abundance compared to deeper water.

Beyond the conventional four directions (east, west, north and south), fishers perceive<sup>10</sup> about the existence of another four directions positioned between the major four directions. These are *Agni* (southeast), *Ishan* (northeast), *Bayu* (northwest) and *Naireet* (southwest) (Figure 5.3). Fishers are aware that the wind does not always

<sup>10</sup> Hindu fishers believe there are religious and mythical lords who stay in each direction, such as *Indra* in the east, *Mohadeb* in the northeast, *Kuru* in the north, *Bayu* in the northwest, *Barun* in the west, *Prithu* in the southwest and the deadly devil *Jom* in the south direction respectively. It is believed 'Jom' attracts humans causing death. Accordingly the southerly from the southern direction is also deadly to fishers. (excerpts of interviews with Nirmal Chakrabarty, priest and village leader, Gorakghata, May 2006)

necessarily blow in a straight direction; it has a tendency to rotate or deflect. Wind direction with a different velocity impacts fishing operations; hook and long liners and *Hilsa* drift netters can bear upto medium to strong current actions, while ESNB and MSBN operators would find it difficult to keep their nets on fishing sites. I noticed that fishers observe critically the intensity of the prevailing wind. At the advent of a storm or cyclone, fishers noted the wavelength becomes longer than the usual 'dancing form of waves'.

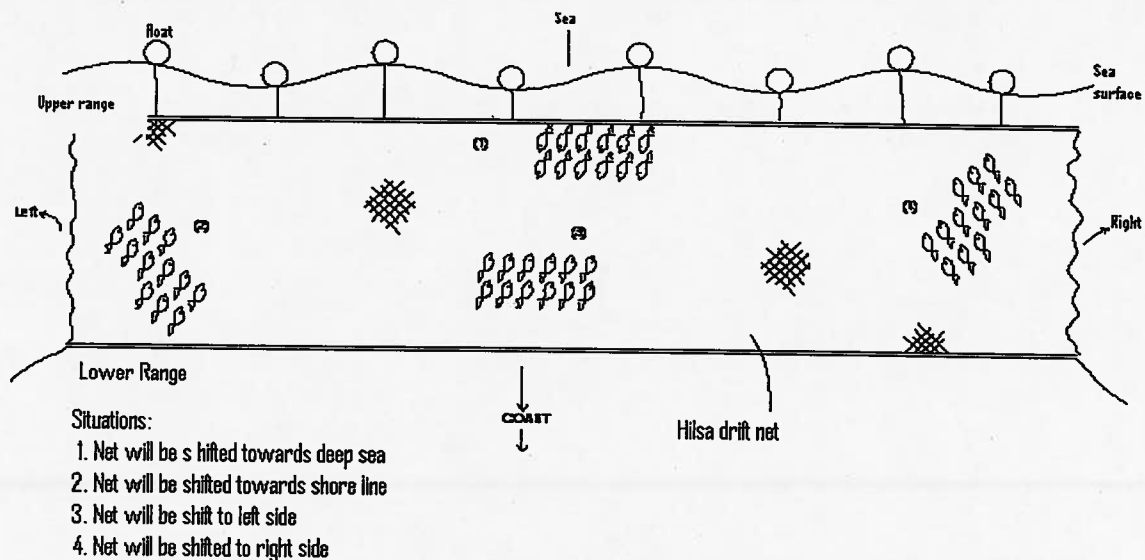


**Figure 5.3: Locally adopted directions** (based on PRA drawing, dated 25-7-2005, Thakurtala)

Apparently there is a linear relationship between current velocity and fish availability. ESNB and MSBN fishers perceive that the stronger the current velocity is (of course within tolerance limit for the net), more fish are tapped inside nets. So they observe the 'direction' of the mouth of the fish caught inside a gill net; for positions like 1, 2, 3 and 4 (Figure 5.4), fishers will move back, right side, back and left side respectively. Experienced fishers hold that fish take the same direction of the 'cyclone

pathway'; shoal from deeper waters appear close to the coast. This is why, following each major cyclone, the catch of *Hilsa spp.* is known to be high in the near-shore areas and the owner of the boats force the fishers to go fishing despite huge risks to their lives and the residual effects associated with major cyclonic events. Fishers try to follow the maximum 'line of penetration' of freshwater into the sea. They perceive that most of the fish 'love to visit' a freshwater zone or 'mixture zone' at certain stages of their lives.

Fishers operating in *Gulitder* and *Bodder* fishing sites know about the existence of 'unusual types of water' (presumably underwater currents), which, when obstructed, occasionally causes upwelling. Many fishers know well about the significance of upwelling (*utala/ tolar pani*); old Hindu fishers perceive such phenomenon as the 'movement of the Goddess Ganga underneath'. Fishers believe that upwelling (*utala*) brings food materials upwards, and thus leading to a good catch. Sea birds are seen to aggregate in upwelling areas. Reportedly upwelling appears with the advent of the warm southerly winds; water mass turns turbid for a few days followed by a change in color.



**Figure 5.4: Positions of fish entangled in net helps in decision making about the probable location of shoal (Based on PRA drawing, Thakurtala 27-3-2005).**

**Lunar periodicity:** Marine ecologists have studied lunar or semi-lunar-day rhythms of animals resident in the marine littoral area (Morgan 2004, Cordell 1974, Johannes 1981). Nishida et al. (2006) provided a nice account of the local knowledge on lunar periodicity

of the crustacean and mollusk gatherers of northern Brazil. Arunotai (2006) mentions nomadic *Moken* artisanal fishers of southern Surin Islands, Thailand divide a month into 'two waters', meaning that there are two high water periods in each lunar month. Experienced coastal fishers of Bangladesh make their 'mental fishing almanac' (lunar days known as '*tithi*') and day-to-day decisions about the duration and timing of fishing, species selectivity, area and depth of fishing, route of journey for fishing and termination of fishing trip in harmony with the lunar periodicity.

It is widely agreed by fishers that certain marine phenomena occur with precise regularity during different cycles of the lunar month and the associated tidal pattern (Figure 5.5, Table 5.7). For example, fishers know that prawns migrate ('*walk*' in fisher's term) through rivers and estuaries under camouflage of the new moon darkness to avoid predators. The coastal inhabitants of Bangladesh experience a semi-diurnal tidal pattern (two high tides or '*Joar*' and two low tides or '*bhata*' in 24 hours). The local construction and understanding of the '*Jo*' (high water periodicity) are '*phulano pani*' (flattened water), '*vora pani*' (full water), '*beshi pani*' (maximum water), '*gorom gaang*' (turbulent sea), and that of the '*dala*' (low water oscillation) are '*kom pani*' (less water), '*thanda gaang*' (quiet sea) and '*taner pani*' (receding water). '*Joar*' and '*bhata*' are daily phenomena, while '*jo*' and '*dala*' are weekly to fortnightly phenomena, though some coastal people use the term '*jo*' as a short version of '*joar*'.

Fishers generally agree that, in a given lunar month, the tidal height and force during '*purnimashi*' (full moon) is slightly stronger than that of '*amabashya*' (new moon). However, the peak tides during the rainy season maintain similar heights irrespective of the new moon and full moon phases. It is generally agreed by the Hindu caste-based fishers that in each Bengali lunar month, there will be two phases of '*jo*'; in each fortnight, there will be 10 days of '*Jo*' (20 days/month) and 5 days of '*dala*' (10 days/month). At least for fishing purposes, the Muslim fishers do not exactly comply with the Islamic 12-month calendar; rather they decisively observe the moon's movement in compliance with the Bengali lunar months.

**Table 5.7: Bengali lunar days and corresponding tidal condition**

Bengali lunar days ( <i>tithi</i> )	Start of tide	Tidal peak	<i>Jo-dala</i> (spring-neap) phase	Remarks
<i>Pratipad</i> -1 <sup>st</sup> lunar day	08 am	12pm	<i>Jo</i> phase	Peak water level
<i>Dwitiya</i> - 2 <sup>nd</sup> lunar day	09 am	01pm	<i>Jo</i> phase	Water level declines
<i>Tritia</i> - 3 <sup>rd</sup> lunar day	10 am	02pm	<i>Jo</i> phase	
<i>Chathurthi</i> - 4 <sup>th</sup> lunar day	11 am	03pm	<i>Jo</i> phase ends	Stable water
<i>Panchami</i> - 5 <sup>th</sup> lunar day	12 pm	04pm	<i>Dala</i> starts	Water level recedes
<i>Shasthi</i> - 6 <sup>th</sup> lunar day	01 pm	05pm	<i>Dala</i> phase	As above
<i>Shaptami</i> - 7 <sup>th</sup> lunar day	02 pm	06pm	<i>Dala</i> phase	As above
<i>Ostomi</i> - 8 <sup>th</sup> lunar day	03 pm	07pm	' <i>Bramma dala</i> '	Low water level
<i>Nobomi</i> - 9 <sup>th</sup> lunar day	04 pm	08pm	' <i>Bramma dala</i> '	As above
<i>Doshomi</i> - 10 <sup>th</sup> lunar day	02 am	06am	<i>Dala</i> ends	Water stable, 'ready to walk'
<i>Ekadoshi</i> -11 <sup>th</sup> lunar day	03 am	07am	<i>Jo</i> phase starts	1 hour back from <i>ekadoshi</i>
<i>Dwadoshi</i> - 12 <sup>th</sup> lunar day	04 am	08am	<i>Jo</i> phase	Water on increase/ 'walk'.
<i>Troyodoshi</i> -13 <sup>th</sup> lunar day	05 am	09am	<i>Jo</i> phase	As above
<i>Chaturdoshi</i> -14 <sup>th</sup> lunar day	06 am	10am	<i>Jo</i> phase	As above
<i>Purnima/purnamashi</i> -15 <sup>th</sup> lunar day (full moon) or <i>Amabashya</i> (new moon)	07 am	11 am, +/- 30 minutes based on area/season	Peak <i>jo</i> phase of the full moon or new moon	Peak water level; geographical variation of time and tidal height is observed

Source: FGD with fishers of *Thakurtala* and *Gorakghata*, March 2005, June 2005. *Moheskhali*.

Fishers observed that the elevation of tidal water prior to a full '*jo*' in the case of the new moon (*amabashya*) is higher compared to that of the full moon (*purnima*) and that the water level following the full '*jo*' period is higher in the case of the full moon (*purnima*) compared to the new moon (*amabashya*). Fishers have a common joke in Bengali: '*Purnimar joer pacha bola, Amabashyar joer aga bola*' (literally, the full moon and new moon tidal patterns bear a resemblance to a woman's puffy hip and extended manly chest respectively). Fishers believe the availability of fish has a temporal dimension<sup>11</sup>; fish abundance is higher during the *jo* compared to the *dala* period. This is why E/MSBN (Estuarine/marine set bag net) and hook and long liners of the greater *Moheskhali* and *Cox's Bazar* region fish during the *jo* and winds up at the advent of *dala*. This myth confronts the fact that in certain fishing areas (like *Kutubdia* and *Sandwip* channel, *Gulitder*, *Bodder* and *Jalchira* near *Sunderbans*), the tidal currents are exceedingly strong during '*jo*'. Fish catch is higher during '*dala*' than that of '*jo*' period

<sup>11</sup> Sarda and Maynou (1998) provide a nice account of fishers' perception. Fishers of Catalan Bay, northwest Mediterranean assert the catch of rose shrimp (*Aristeus antennatus*) is higher on Fridays than other days of the week. After two years of data collection and subsequent statistical analysis, they concluded: 'Summarizing our findings, we report that off the Catalan coast, the catch of rose shrimp is the highest on Fridays'.

with a sharp variation in catch composition. The tidal current during the 'jo' period is so strong that fishers can not set their ESN or MSBNs in the coastal channels. The amount of fish caught during the 'dala' phase is insignificant in the Moheskhal region. Figure 5.6 depicts the seasonal variation of fish usually caught in E/MSBNs.

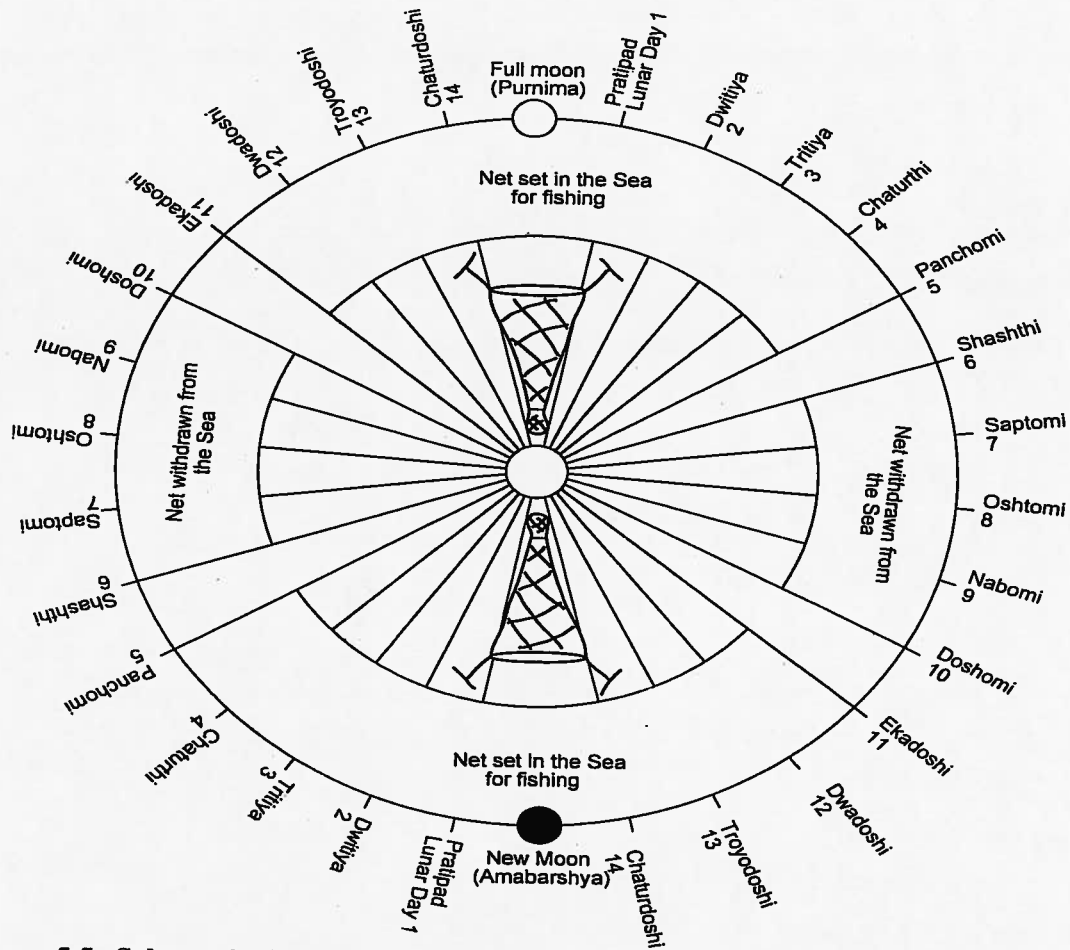
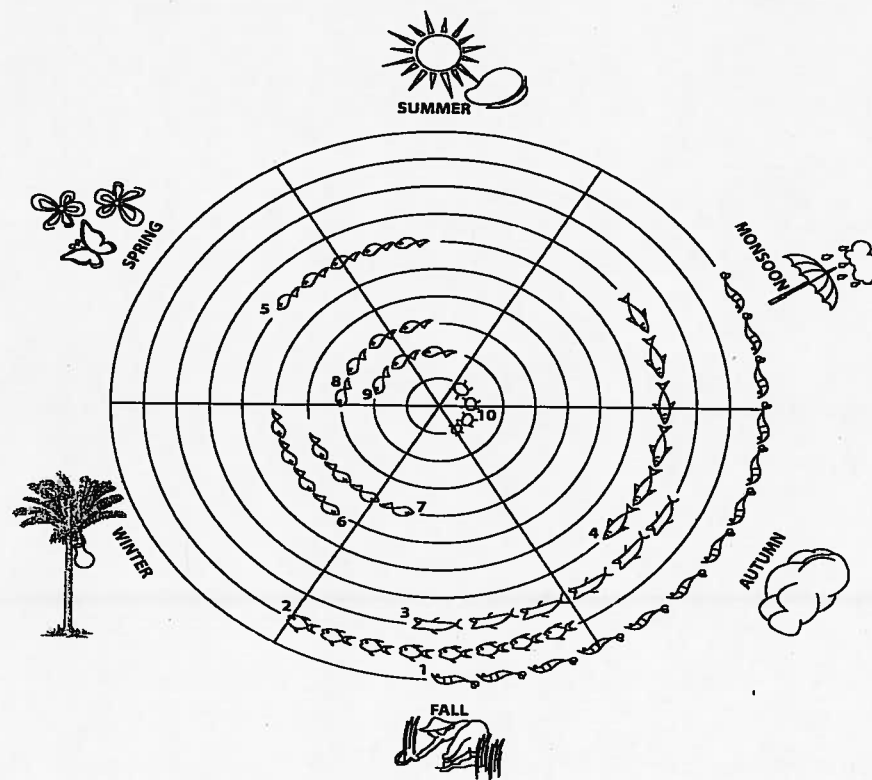


Figure 5.5: Schematic diagram of lunar days in relation to fishing operation (redrawn from PRA sketch, 26-4-2006, Thakurtala).

Based on the seasons and depth, the fishers either fish during 'dala' and wind up nets during 'jo' (monsoon months) or maintain nets throughout both the 'jo' and 'dala' (dry months). This trend has local variation (details in Table 5.8). As the *dala* invites more freshwater influx to the coast, the likelihood of getting freshwater and brackish water species is also deemed high. According to experienced fishers of Thakurtala, in the first *Ekadoshi* and *Dwadoshi* (11<sup>th</sup> and 12<sup>th</sup> lunar days) of the month, shoal fish appear more; only a few other species (Ribbon fish, snappers, croakers, threadfins, big eye tuna, even Indian salmon) but of good size and quality are found. In the days following 'voron

*jo* (tidal peak with turbid water), species like brown shrimp, kuruma shrimp, Bombay duck, green tiger shrimp, banana shrimp, kiddi shrimp, threadfins and small croakers are caught more. Fishers believe if the white big ribbon fish is caught in the net, the following day there will be less or no fish of the same species in the net in the specific area. The reason behind is not known. That is why with a bumper catch of white ribbon fish, fishers sometimes tend to change their spots. White ribbon fish is usually considered as a fish of the *dala* phase, habituating in less turbid water; they are comparatively less caught during the *jo*. However, generally on the 8<sup>th</sup> and 9<sup>th</sup> lunar days (*ostomi* and *nobomi*) of the winter (*poush-magh*) months, there is hardly any catch in the ESBNs and MSBNs and the fishers in the Moheskhali region usually wind up their nets for drying, treatment or weaving. One Bengali proverb goes: '*Ostomi nobomi bramma dala, Koi geli tui jailla hala*' (literally, lunar days 8<sup>th</sup> and 9<sup>th</sup> are exceedingly dull; where do the loutish fishers go fishing these days?)'



**Legend:** 1. Shrimps *Penaeus* spp. 2. 'Iskiri', 3. 'Churi' (*Lepturacanthus savala*), 4. 'Loitta' (*Harpodon neherius*), 5. 'Phaissa' (*Thryssa* spp.) 6. 'Poa' 7. Pomfrets 8. 'Bata' *Mugil* spp. 9. 'Olua' (*Coilia dussumieri*) and 10. Crabs

**Figure 5.6: Seasonal abundance of fish**

Expert fishers observed the 'diurnal pulse'<sup>12</sup> (as shown in Figure 5.5, Table 5.7) has some impact on the catch and its composition; the *borshi* (hook and long line) operators avoid the surface layer by the day and targets the bigger fish staying below the surface layer through a change in the line up (vertical alignment or horizontal alignment close to bottom). The ESNB fishers netting in shallow waters have nothing or very little to do with such diurnal variation. However, the MSBN operators netting off the coast target the sub-surface layer by day and the surface layer at night. The *Hilsa* netters have the operational advantage of adjusting their nets to different depths and the probable locations of shoal. It is well-agreed that under any given circumstance, small fish dominate the surface layer in the daytime and medium to larger fish come up from sub-surface and bottom layers closer to the surface for food. 'How do you feel if you are forced to look at the sun directly or somebody throws torch-light on your face? Same way, fish avoid sharp sun light at daytime,' says Sadhon Jaladas (43, Thakurtala).

Fishers as well as the wider coastal communities agree on the variations in taste of certain fish and other edible seafood. It is well agreed that mud-crabs captured during the full moon (*purnima*) will be '*fokfoka*' (whitish), meaning less muscle and eggs inside. Such crabs hold low value than those caught during the new moon (*amabashya*). Probably this is linked to spawning behavior and other metabolic processes of the species. It is well accepted that the hair fin anchovy '*phaissa*' (*Setipinna taty*) of Rangabali, '*choto loitta*' (*Harpodon nehereus*) of Kutubdia, '*icha gura*' (*Acetes* spp.) and '*choto loitta*' (*Harpodon nehereus*) of Kattali, Chittagong; '*icha gura*' (*Acetes* spp.) of Moheskhali and ribbon fish of Sonadia Island are famous to the consumers. A detailed study is needed on the food and nutrient contents of water and soil of the said areas.

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<sup>12</sup> The phenomena of avoiding light (diurnal or vertical migration and deep scattering layer) by animals can have a number of adaptive advantages like avoidance of predators, keeping away from certain fouling secretions of photosynthesis by certain phytoplankton, etc.

**Table 5.8: Catch variation in different gear in different lunar periodicity**

Gear	Jo (Spring tide)		Dala (Neap tide)	
	Purnima (Full moon)	Amabashya (New moon)	Purnima (Full moon)	Amabashya (New moon)
ESBN	<i>Acetes japonicus</i> , <i>Mystus gulio</i> , <i>Lates calcarifer</i> , <i>Arius</i> spp., <i>Cynoglossus</i> spp., <i>Drepane longimana</i> , <i>Loligo</i> sp., <i>Ephippus orbis</i> , <i>Harpodon nehereus</i> , <i>Mugil</i> spp., <i>Liza subviridis</i> , <i>Valamugil speigleri</i> , <i>Eleutheronema tetradactylum</i> , <i>Setipinna taty</i> , <i>Trichurus savala</i> , <i>Coilia dussumirei</i> , <i>Escualosa thoracata</i> , <i>Metapenaeus monoceros</i> , <i>Penaeus merguensis</i> , <i>M. brevicornis</i> , <i>Neptunus</i> spp., <i>Nematopalaeomon tenuipes</i> , <i>Otolithes</i> spp., <i>Trichurus savala</i> , <i>Penaeus indicus</i>	<i>A. japonicus</i> , <i>Sepia</i> sp., <i>Gerres</i> spp., <i>Lutjanus</i> spp., <i>H. nehereus</i> , <i>Polynemus paradiseus</i> , <i>P. argenteus</i> , <i>Therapon jarbua</i> , <i>P. semisulcatus</i> , <i>P. japonicus</i> , <i>Neptunus</i> spp., <i>Trichurus</i> spp.	<i>A. japonicus</i> , <i>H. nehereus</i> , <i>Mugil</i> spp., <i>M. monoceros</i> , <i>P. merguensis</i> , <i>Eleutheronema tetradactylum</i> , <i>Setipinna taty</i>	<i>Acetes japonicus</i> , <i>Sepia</i> sp., <i>Trichurus savala</i>
MSBN	<i>Lutjanus</i> spp., <i>Pomadasyss hasta</i> , <i>Mugil</i> spp., <i>Liza subviridis</i> , <i>Valamugil</i> spp., <i>Sillago domina</i> , <i>Trichurus savala</i> , <i>Setipinna taty</i> , <i>Escualosa thoracata</i> , <i>P. merguensis</i> , <i>P. monodon</i> , <i>Metapenaeus monoceros</i> , <i>Parapenaeopsis stylifera</i> , <i>Tachysurus</i> spp., <i>Sillago domina</i> , <i>Megalaspis cordyla</i> , <i>Pomadasyss</i> spp., <i>Johnius bleekeri</i>	<i>Valamugil</i> spp., <i>H. nehereus</i> , <i>J. bleekeri</i> , <i>Parastromateus niger</i> , <i>Trichurus</i> spp., <i>Hemirhamphus</i> spp., <i>Setipinna taty</i> , <i>M. monoceros</i> , <i>Pomadasyss</i> spp., <i>T. jarbua</i>	<i>Harpodon nehereus</i> , <i>Mugil</i> spp., <i>Metapenaeus brevicornis</i> , <i>Trichurus savala</i>	<i>H. nehereus</i> , <i>Megalaspis cordyla</i>
Hilsa net	<i>Hilsa ilisha</i> , <i>H. toli</i> , <i>Pomadasyss hasta</i> , <i>Argyrops spinifer</i> , <i>Ilisha filigera</i> , <i>Pampus</i> spp., <i>Setipinna taty</i> , <i>Johnius bleekeri</i>	<i>H. ilisha</i> , <i>H. toli</i> , <i>Johnius argentatus</i> , <i>Pampus</i> spp.	<i>H. toli</i> , <i>Johnius bleekeri</i> , <i>Tachysurus</i> spp.	<i>H. toli</i> , <i>Tachysurus</i> spp.
Long lines	<i>Polynemus indicus</i> , <i>Cybbium guttatum</i> , <i>Pangasius pangasius</i> , <i>Otolithes maculatus</i> , <i>Johnius argentatus</i> , <i>Megalaspis cordyla</i> , <i>Protonibea diacanthus</i> , <i>Muraenesox</i> spp., <i>Epinephalus</i> spp., <i>Sarda orientalis</i> , <i>Tachysurus savala</i> , <i>Thunnus obesus</i> , <i>Scomberomorous</i> spp., <i>Rastrelliger kanagurta</i> , <i>Scoliodon</i> spp., <i>Himantura</i> spp. etc.	<i>Polynemus indicus</i> , <i>Cybbium guttatum</i> , <i>Scomberomorous</i> spp., <i>Rastrelliger kanagurta</i> , <i>Johnius bleekeri</i> , <i>Scoliodon</i> spp., <i>Tachysurus savala</i> etc.	<i>Johnius bleekeri</i> , <i>Johnius argentatus</i> etc.	<i>Otolithes maculatus</i> , <i>Johnius argentatus</i> etc.

Source: FGD with experienced fishers of Thakurtala and Gorakghata, (March 2005, May 2005), Moheskhali

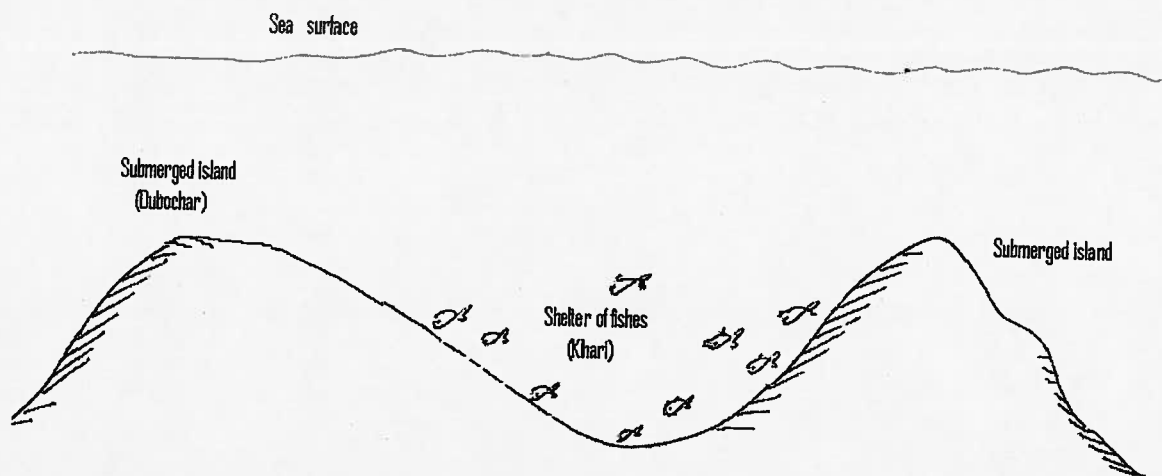
**Sediment and topography:** The ESBN and MSBN fishers examine the likely elevation of the topography and mud content organoleptically. Fishers mentioned about sandy (*balu mati*), gravel rich (*Pathar mati*), clayey/muddy (*Kada mati*) and slightly silty (*Moina mati*). Sandy mud is reported from coastal areas near sandy beaches and off St. Martin Island. Clayey mud is found beneath red water, greenish water and turbid water masses and characterizes most of the important fishing sites. They can analyze the mud content using their fingers *in situ* and instantly find out the type. In one journey, I asked an expert

*majhi* (Nilu Jaladas, 52, Thakurtala) how he decides about the mud type and quality. He instantly made two rings out of the contents; one showed minor cracks on the periphery (*decision*: sand rich) and the other did not (*decision*: muddy, silt rich). Fishers mention the sandy zone with the presence of 'silvery mottles' is not inhabited by fish. Fishers generally agree that *Hilsa* fish prefer 'soft' blackish mud for their food. '*Blackish mud can even be devoid of fishes; some riverine and coastal areas with big industries, municipal pollutants, shrimp hatcheries,<sup>13</sup> etc. are like deserts*' (*ibid*)'

Fishers with long mileage in the fishing profession mentioned the topography of the sea is changing rapidly. Brajahori Jaladas (56, Kutubdia Island) adds: '*coast line is becoming dangerous; numerous 'dubo chars' (submerged islands) are emerging every year; the fish-rich edges known to fishers are also changing in terms of depth and location and it is becoming increasingly difficult for fishers to keep pace with the change*'. Such rapid changes in sea-bottom morphology as perceived by fishers might be attributed to the increasing trend in global warming. Fishers interviewed did not mention about 'global warming', but they assumed things in nature are changing rapidly. Fishers observed that fish of all sizes are abundant along the edge (*dhair*) of the submerged small islands (*dubo chars*) (Figure 5.7). However, big fish which can withstand the higher velocity of underwater current can be found more along the deeper portion of the '*khari*' (bed of the valley). Another possibility behind this judgment is that the edge with relatively flat elevation provides more rooms for feeding or grazing compared to that of a steep '*khari*'. However, preference in targeting the area and depth varies based on gear and targeted species.

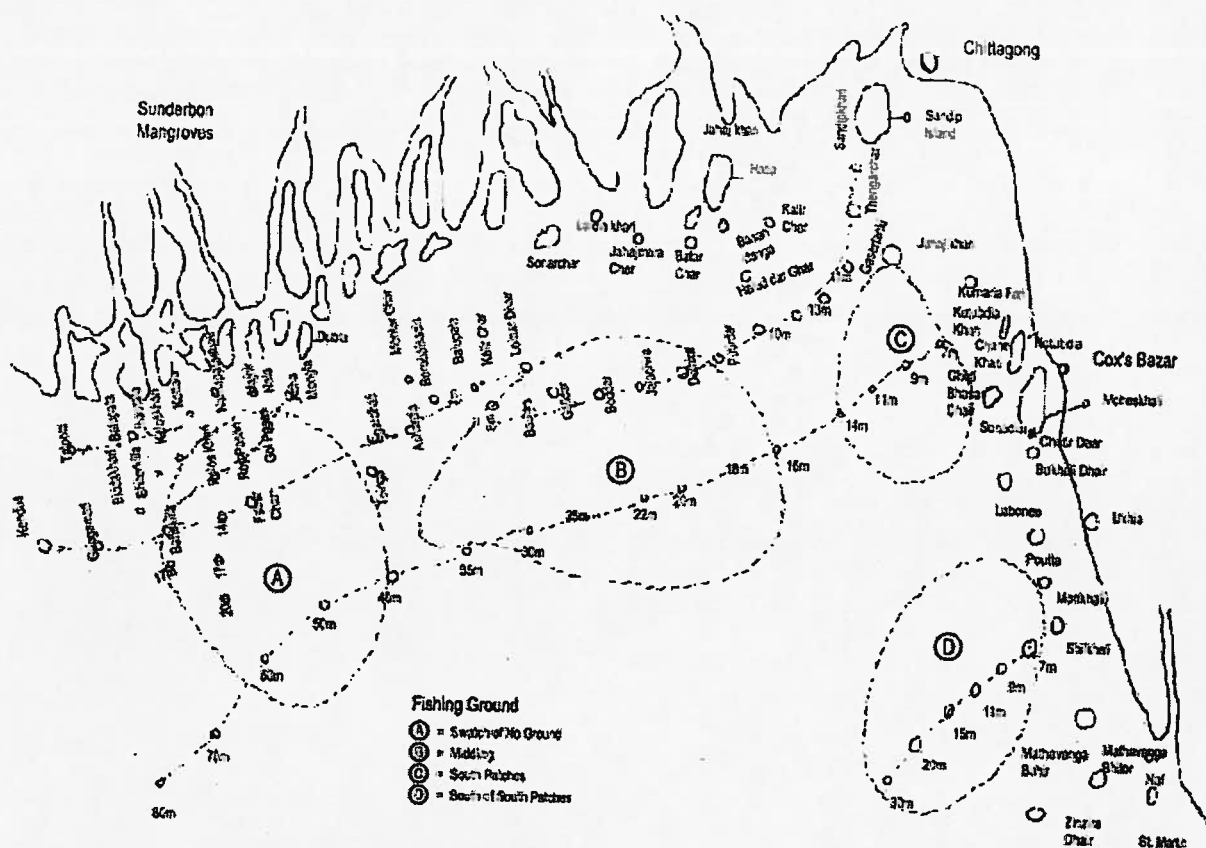
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<sup>13</sup> Around 50 shrimp hatcheries operate in the Kalatoli zone along the Cox's Bazar sea beach. It is widely known that all the hatcheries discharge huge volumes of untreated effluents containing chlorine, formalin, malachite green, saponine, antibiotics, etc. Fishers believe small fish are becoming scarce in the Kalatoli hatchery zone.



**Figure 5.7: Schematic diagram of submerged island (*Dubochar* and *Khari*) in relation to fish availability (redrawn from PRA sketch, 28-4-2006, Thakurtala)**

**Fishing sites:** Fishing areas traditionally known to and identified by fishers is a valuable tool for artisanal fishery management. Schafar and Reis (2008) nicely geo-referenced 124 fishing areas, identified on the basis of local ecological knowledge of the fishers of the Patos lagoon estuary, Brazil. This demonstrates well how TEK can be an important source of reference for GIS applications. In the past four decades, several scientific studies came up with the existence of four fishing grounds (namely 1. Swatch of No Ground, 2. East of Swatch of No Ground, 3. Middle Ground, and 4. South Patches) in the Bangladesh part of the Bay of Bengal (Figure 5.8). None of the fishers that I met in the greater Cox's Bazaar and Chittagong districts could mention even a single name of the fishing grounds. Surprisingly, fishers did describe more than 50 fishing sites (Figure 5.8); some are parts of the officially declared fishing grounds and some are not; some sites are espoused with local names and others with only the depth contour (in terms of meter/*bam*). These fishing sites are relatively smaller compared to the officially recognized grounds. The fishing sites have separate identity and importance to different fishing groups; some sites have attained more of a reputation than others for the abundance of specific fish. Some spots are over-fished while the deeper sites remain under-fished. However, it should be noted here that the exact geographical location might not be spotted in the map by the fishers due to their unusualness with such works, and hence further *in situ* verification is deemed necessary.



**Figure 5.8: Fishing sites and grounds as accumulated from a series of focus group discussions at Thakurtala and Gorakghata (22-3-2005, 27-5-2005, 10-8-2005 and 27-2-2006).**

**Risk management:** In this section, I will mention some experiential learning on the indicators of cyclones. Fishers have developed a practical knowledge base on the natural rhythms of the sea as well as unnatural symptoms that alert them to unusual phenomena. Such an inherent understanding of the natural phenomena is very important for survival. Arunotai (2006:143) mentions an interesting case:

*'While hundreds of thousands perished along the coasts struck by the tsunami (December 2004), not a single life was lost in the Surin islands, despite the fact that the villages...were entirely swept away. The Moken (nomadic fishers) had never before witnessed a tsunami. Yet when they observed the waters along their shores receding in an aberrant manner, they immediately responded by running to high ground'.*

Coastal fishers rely more on visible (cloud), sensory (wind, heat), biotic (behavior of certain animals) and abiotic attributes including meteorological and cosmological attributes, rather than relying exclusively on meteorological forecasts. Most of them go out to sea devoid of basic safety items like buoys, radio, etc., let alone using any navigational equipment. Experienced fishers told me about some critical observations as

indicators of cyclones: 1). fatty 'loitta' (*Harpodon neherius*) and marine snakes come out from the bottom of the sea and are abundant; 2). the clouds become darker and red in the northeast and northwest directions (*ishan /bayu kone*) and appear closer; 3). stronger winds blow with a high pitch of 'shnow-snhow' sound and cause skin burn (probably caused by charged particles of salts), and occasionally a 'void state' of wind is observed followed by violent wind; 4). distance between the 'head' of two successive waves is longer than the usual one; 5). wave height increases with more forces; 6). fish are scattered, and more prevalence of jelly fish and squids; 7). sea birds behave and shout abnormally and fly towards shore or island; 8). water seems to be warmer than usual; 9). ESNB and MSBN tend to come up due to excessive rolling, and gill nets get entangled; 10). small to medium sized water spouts observed; and 11). sound generated due to splashing of waves with hull is different from the usual sound. None of the indicators mentioned above is singly indicative of the severity of the weather condition; fishers make their assessment based on couple of indicators like wind velocity, wave height and sky condition.

There are some more observations on the movement of clouds and rain during cyclone/storms: frogs generate elevated sounds in the paddy fields; domestic animals like cows, dogs and cats shout and show unusual behavior; ants (with eggs) and snakes come out from holes; massive movement of dragon flies in the sky ; small fish jump on the surface water of ponds; birds fly alone chaotically in desperation and not in straight direction; leaves of the 'mander' tree (Indian Coral tree, *Erythrina variegata*) show downward position; muddy smell in the air; nocturnal animals are seen in the day time, and wind blows with 'circular effects'.

### **5.5. Physical capital**

The DFID Livelihood Program defines physical capital as 'the store of human-made material resources' (source: [http://www.smallstock.info/issues/sust\\_liv.htm](http://www.smallstock.info/issues/sust_liv.htm), accessed September 2008) comprising manufactured capital and basic infrastructure facilities like houses, drinking water, sanitation, roads, equipment, community facilities etc. which have a bearing on healthy living condition, economic production system, productive working days, health, overall well-being and social dignity. Table 5.9 provides a picture of the housing conditions of the fishers in two villages. Generally, the housing materials

and co-existence of some essential facilities (latrine, tubewell etc.) indicate one's living standard and financial ability. Only the houses of the remittance earners (Volarkandi) and mechanized boat owners (Thakurtala) in the study villages have an extra sitting room (*Baithokkhana*) for guests and separate cooking rooms (*Ranna ghor*).

Overall, the condition of housing of the poor, especially in the coastal village, is precarious. They make the best use of dried coconut leaves, shrubs, torn polyethylene sheets etc. to make a cover and the suffering of the dwellers during the monsoons is beyond description. *'The sunshine is tolerable; how long can you remain under torrential rains in wet clothes with small children? They suffer from coldness and then the situation aggravates as I fail to buy medicine for want of money. Food is also irregular because of hardship during monsoons and moreover, there remains no dry place to cook,'* said Arati Jaladas, Thakurtala. The poor floodplain villagers usually make the best use of jute sticks for constructing their houses, outside cooking room, pet house (*goal ghor*) and latrines, while the villagers on the coast use bamboo-made walls. Irrespective of the materials used, I observed that more than 70% of the houses are in bad condition; most rooms are small, overcrowded, wet, smelly, dark, poorly ventilated and infested by bedbugs, cockroaches and rodents. The coastal village is densely populated; 78 families with a population of 650 live in an area of around ten acres. A plain bamboo wall costs about 60% of the cross-fenced '*doa-dhara berra*'; brick wall semi-pucca houses symbolize power and wealth in the villages.

**Table 5.9: Spectra of living condition (1 US\$= Taka 65)**

Materials type	Village	Condition		No. of HH	Value (US\$)	Room and average area		Land ownership pattern	
		Good	Bad			No.	Area-ft <sup>2</sup>	M	F
Homeless	C	-	-	1	-	-	-	-	1
	F	-	-	2	-	-	-	-	2
Polythene/mat surroundings	C	-	5	5	5-15	1	80	4	1
	F	-	3	3		1	144	-	1
Bamboo or jute stick fence wall, thatched roof with polythene, coconut leaves, gunny bags	C	13	35	48	45-110	2	160-300	36	12
	F	12	21	33		1-2	240-380	26	7 (2 khas)
Plain bamboo fence wall with bamboo pillars, thatched or partial tin roof	C	8	10	18	90-250	2	300-450	15	3
	F	3	4	7		2	400-600	6	1
Quality bamboo frame or tin wall with wooden pillars, thatched roof or tin with wooden frame	C	2	3	5	350-750	2	400-660	5	-
	F	5	8	13		2-3	400-700	11	2 (1 khas)
Semi-pucca/ single storied building	C	1	-	1	1800	2	750	1	-
	F	1	-	1	22,500	3	880	1	-

(Source: Field survey 2005, coverage: coastal-78HHs, Floodplain- 60HHs)

As shown in details in Table 5.10, though the poor have little ownership of tubewells, they have easy access to the tube wells installed by the rich people or development projects. >60% of the population can use sanitary and earthen latrines, and the vast majority is deprived of electricity. There is hardly any sanitation facility between houses, and inappropriate disposal of household discards (e.g., kitchen wastes, waste water) fetch occasional conflicts among neighbors. As a result of poor sanitation, fever, hook-worm infestation, skin diseases, dysentery, respiratory troubles and diarrhea are reportedly quite common across all health categories. Though improvement in hygienic practices are observed as results of project interventions, open latrines are still common; open defecation on the street by children is traditional; women usually wait for evening time and darkness to defecate along the channel.

Small low-cost boats and floating crafts made of banana stems are the only sources of communication during the monsoons. One of the important life skills for the inhabitants (children to adult men and women) is to know the navigational routes and learn how to row. There are hardly any roads that connect the villages during the drawdown period in the *haor* area; villagers construct 'biodegradable roads'<sup>14</sup> using water-hyacinth.

**Table 5.10: Spectra of availability of basic amenities**

Latrine use	% of HH		Drinking water	% of HH		Tubewell ownership	% of HH		Electricity	% of HH	
	C	F		C	F		C	F		C	F
Sanitary	55.1	26.6	Tubewell	100	96.7	Self	5.1	18.3	No connection	96	95
Earthen pit	24.3	36.6	Pond	-	1.7	Joint	2.6	8.3	Connected	4	5
Bush	8.9	15.0	River	-	-	Neighbors	-	3.3	1 bulb	-	-
Open field	3.8	8.3	Well	-	-	DPHE	1.3	3.3	2 bulbs	2.6	-
Hung type	6.4	11.7	Municipal	-	-	NGO	1.3	6.7	Bulbs & fan	1.3	3.3
Others	1.3	1.7	Rainwater	-	1.7	ECFC/others	3.9	1.7	Others	-	-

(Source: Field survey 2005, C-78, F-60)

Under the physical capital category, I would like to examine briefly the key aspects of crafts and gear used by the fishers. The floodplains and coasts of Bengal represent a very rich variety of crafts and gear (Ahmed 1970, Chakraborty et al. 1995,

<sup>14</sup> For convenience of communication, such biodegradable seasonal roads are extremely important; construction of such roads utilizes lots of water-hyacinth and thus playing significant role in lessening this aggressive plant. The roads are sustained for a maximum of 2 months. The nice thing is it allows water to percolate between connecting fields; some catfishes are also known to pass through. At the advent of the dry period, the water-hyacinth gets degraded and thus produces huge amounts of nutrients into the ecosystem. Farmers are seen to use the rotten water-hyacinths for producing gourds for fast growth.

Alam et al. 1997, Das and Bandayapaddaya 1999). Fishers evolved the use of multiple gears mainly in compliance with the hydrological patterns and seasonality, geographical locations, targeted species, life cycle of the fish and economic capability. Full-time fishers commonly use relatively costly and efficient gear requiring higher operational skills, while the subsistence fishers use low-cost gear like caste nets, push nets, traps, rods etc. Subsistence fishing using simple tools like caste nets, rods, small traps and even bare hands is culturally ingrained<sup>15</sup> and common in inland and coastal areas. The inland fisheries sector still retains its prehistoric gear with manual operations, except for the introduction of some destructive gear like 'current nets' (monofilament net) and synthetic dense-meshed encircling gear. These fishing crafts and gears have evolved through a historical process of adaptation to the immediate ecosystem where fishers fish. These aspects of the evolution in technology and their impacts on livelihoods and resources really deserve a separate detailed study.

Question arises here: are fishing technologies homogenously distributed among the fishing villages? At the beginning of my field work, I noticed that artisanal fishers of a particular fishing village usually stick on the use of a particular gear although the fishing villages are characterized by similar geographical characteristics and catch compositions. This might be attributed to two reasons: 1). particular villagers attain expertise on certain gear, and such local expertise is important for the weaving and repairing of the gear, and 2). fishers usually do not want to change their technology without long-term local level observations. In the costal areas, fishers of Hindu dominated Thakurtala and Gorakghata adhered to ESNB/MSBN; the Buddhists of the

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<sup>15</sup> I recorded some of the unique gear and methods from the *haor*. I found small boys/girls and housewives using bamboo made sieves (*Chaluni*) during the drawdown phase when movement of the fish become visible. Some fishers up-turn dense vegetations to catch prawns and climbing perch, *Anabus testudineus*. Subsistence fishers use cast nets (locally known as *khepla/jhaki* (diameter 4-8m, # 2-6 cm, made of nylon twines) in plain areas during and after the monsoons to catch small and medium sized fish. Around 30 minutes prior to casting the net, some fishers use stirred rice bran and cow dung mix in clean areas to attract fish. Floodplain dwellers also use a bell-shaped bamboo trap '*polo*' during summer and winter in the beels individually or with other villagers as part of 'community-based fishing'. Subsistence fishers also use spears made of one or multiple sharp rods. I noted lantern fishing (now rare) using bright 'hajak light' (kerosene lamp) in the '*Jollar beel*'. The fisher hides at the anterior end of the boat behind the light and spears big fish easily. Local laborers of the tea garden (*Kuli*, downgraded poor Hindus) catch mud-dwelling eel ('*kuiccha*', *Monopterusuchia*) using a simple bend rod (1-1.5m inserted inside a piece of wood called '*keola*') after carefully observing the movement of water and turbidity at the mouth of the hole.

Rakhainpara village adhere to traps (70% traps, 15% ESN, 15% hooks); fishers of Muslim dominated *Charpara*, *Dembuni*, *south Bot Tola*, *Meheriapara*, *Taziakata*, *Sonadia* and *Ghonarpara* adhere to gill net ('*Illish jal*'). *Behundi* (Estuarine/ marine set bag net), an important gear widely used in the coastal and marine zones, symbolically stands for the caste-based Hindu fishers. In the floodplain site, the fishers of Volarkandi use mainly gill nets, lift nets and long lines, while those of Pabijuri village use traps only. It is beyond the scope of this chapter to provide a description of all the gear recorded from the floodplain and coastal areas. However, gear considered as most important<sup>16</sup> by the fishers is furnished in brief in Appendix 3.

Fishing boats used by floodplain fishers are small (locally called '*nao/kosha/dingi*'), manually operated and mostly consistent in size and shape (specifications: L 4-10m, W 0.8-1.5m, H 40-60cm; with or without the provision of sail). Most of them have bamboo-split-made 'floor' for ease of walking, resting and reducing water temperature of the fish holes. Crafts operating in the sea are bigger, equipped with engines<sup>17</sup> (specifications: L20-35 cubit, W5-8 cubit, H2.5-5 cubit), and costly (US\$ 10,000-45,000). Boats with smaller size and engines (20-30HP) are usually used for hook and long lines and E/MSBNs, and those with 40-65+ HP are usually used for gill nets and MSBNs. Big mechanized boats have the provision of 'cabin' of 12-16 m<sup>2</sup> area as a 'resting place' for 12-18 fishers. During my voyage with the fishers in the sea, I saw fishing crews sleeping in such a level of congestion it was as if 'one climbs on another' and hardly there was any space between two crews.

<sup>16</sup> I consider it necessary to record some gear that are on the verge of extinction for historical records. '*Patoni jal*' is a prototype of ESN with two layers of mesh in the mouth that act against reversal efforts of the trapped fish; fishers realized that the extra internal layer is not necessary; only a few still seen in Chittagong coastal areas. '*Balin jal*' is a triangular shaped net operated from the anterior portion of the subsistence fisher's boat. In case of strong currents, somebody used to keep it fixed after anchoring the net. '*Haddi jal*', a funnel shaped net with mesh <1cm set at sub-surface layer to target shrimp, mullet and small fish. '*Kadi jal*' is an encircling gear measuring L20-30m, W 1-5 m and # 2-3cm; 2 persons draw from two sides with ropes on the knee; supported by bamboo pieces '*kadi*'.

<sup>17</sup> I recorded Chinese Dong-Feng engines of 3, 6, 8, 12, 16, 18, 20, 22, 37, 45 HPs; Japanese Yanmer engines of 18.5, 20, 22, 33, 36, 45 and 65 HP, and Kubota engines of 22 HP. To have a 'Japanese engine' is prestigious for the boat; Chinese engines are cheaper but reportedly start having troubles after 2-3 years.

### 5.6. Natural capital

Natural capital usually comprises nature's environment, goods and ecosystem services, and is essential for economic activities and sustaining all forms of life. This section examines the roles of natural capital in the livelihoods of the fishers. I assert that the availability of and access to natural resources is directly related to livelihood functions and the sustainable use of the resources can be translated to source of wages. I provide a detailed discussion on the health of the natural capital in section 6.2.1 under Chapter Six.

Ekins (2003) summarizes how natural capital provides four classes of fundamental environmental functions: 1). source functions (e.g., providing fish for consumption), 2). sink functions (e.g., accumulation of upland wastes), 3). life support functions, and 4). human welfare functions. Research in different parts of the world revealed that 'not only do the rural poor rely heavily on natural resources, they also increasingly live in areas of high ecological vulnerability and relatively low levels of resource productivity' (Baumann 2002:4). The traditional Hindu fishers claim that their rights over certain fishing areas are denied by state agencies. Scholars agree that indigenous peoples across North America, Latin America, Northern Europe, South Asia, and Southeast Asia are making similar claims: the right to control their lands and resources as a basis of their livelihoods and local economy; the right to self-determination and self-governance; and the aspiration of representations through their own socio-political institutions (Colchester 1994, Smith 1999, Battiste and Henderson 2000, *cited in* Berkes 2008: 258).

However, there are differing views also. Some economists argue 'natural riches produce institutional weaknesses; weak institutions generate conditions that give rise to voracity effects through which interest groups devote their energies trying to capture the economic rents from natural resources' (Lane and Tornell 1996, *cited in* Bravo-Ortega and Gregorio 2007: 73). It is claimed that the natural resource sector can engage only a small and constant amount of human capital and does not grow; although a larger endowment of natural resources increases income/capita but simultaneously reduces the rate of growth of the economy (*ibid*). Obviously this sort of generalization fails to

consider the contextual issues of developing countries and the significance of natural resources in the livelihood functions of the poor.

Let me consider the case of floodplain fishers. Among all the natural capital, ownership of land is the single-most important determinant of rural households' food security and social status. As discussed in the section 5.2, the distribution of land is highly skewed and a sheer majority is absolute and/or functionally landless (85.8% in the coastal village and 38.3% in the floodplain village). In the floodplain, some households depend on sharecropping/ leasing/renting of lands and agricultural day-labor for supplementing incomes. Limited scale poultry and animal husbandry in the homestead areas is critical as a livelihood diversification strategy and coping action for the poor. It is not the adoption of husbandry practices and skill, rather the area of homestead land appears as a limiting factor for the poor and landless. Such husbandry practices are influenced by access to agriculture or common grazing lands for fodder.

Table 5.11 provides a comprehensive account of the importance of the wetland aquatic vegetations for livelihoods of the poor. CNRS (2002) in a study showed that 32% of the families living around Hakaluki *haor* collect aquatic vegetation for meeting their needs. In my analysis involving the poor families, a higher level of dependence was observed. During crisis periods, around 80% of the poor families have some degree of dependence on the wetlands for gathering food. Around one-fourth of this group sells the plant-based foods for income, whatever amount it is. Social taboos prevent women from actively exploiting the *haor* resources, but desperate destitute women care little about such limitations.

The *haor* is the most important source of support system for meals at almost no cost during the crisis period. They continue to harvest from May to December depending on the water level and targeted species. Small snails are collected by some women for feeding ducks and selling to trap operators. Quantity and individual size of commercially important fish in the *haor* is undeniably the most important resources for the fishers. With the advent of floods, fish disperse out from larger waterbodies, and many households with able-bodied males or females start catching fish with whatever gear

possible. Subsistence fishers with a poor wealth base usually catch for own consumption and sell the surplus for augmenting their income.

**Table 5.11: Commonly used aquatic vegetations, amphibious hydrophytes and terrestrial plants in the floodplain for different purposes**

Uses	Plants*	Users	Remarks
Food	Stems of <i>Nymphaea nouchali</i> ('Shapla, roktokomol'); stems and leaves of <i>Ipomoea aquatica</i> ('Kolmi'), <i>Enhydra fluctuans</i> ('Helencha'), wet carnal of <i>Trapa bispinosa</i> ('Shingra') and <i>Nelumbo lucifera</i> ('Padmo'), seeds <sup>18</sup> of <i>Euryale ferox</i> ('Makna') (wet, boiled, dried and fried), stem and leaves of <i>Alternanthera sessilis</i> ('Maloncho')	80.0%	Important for destitute women and children
Fuel	<i>Phragmites karka</i> ('Nol khagra'), <i>Barringtonia acutangula</i> ('Hijal'), <i>Pongamia pinnata</i> ('Koroch'), <i>Crataeva nurvala</i> ('Barun'), <i>Lagerstroemia speciosa</i> ('Jarul')	46.7%	Men and women of varying ages
Fodder	<i>Hygroryza aristata</i> (Futki), <i>Nymphaea stella</i> ('Nil padmo, Shundhi'), <i>Eichhornia crassipes</i> ('Kochuripana'), <i>Panicum palludosum</i> ('Jhara dhan'), <i>Potamogeton</i> sps. ('Paniagacha'), <i>Nymphoides indicum</i> ('Panchuli') (Cow and buffalo prefer <i>Nymphaea stella</i> and <i>Hygroryza aristata</i> respectively)	60.0%	Women from nearby villages, men from different villages
Economic	<i>Cyperus</i> sps. ('Murtha'), <i>Typha</i> sps. ('Hogla'), <i>Clinogyne dichotoma</i> ('Shitol pati'), <i>Aeschynomene</i> sps. ('Shola'), <i>Saccharum spontaneum</i> ('Khag'). Leaves of <i>Nelumbo lucifera</i> used for shade on fish during transportation	26.7%	Usually men but used by both men and women
Herbal medicine	Leaves of <i>Adahota zeylanica</i> ('Bashok') used as expectorant, bronchodilator and respiratory stimulant specially for children; wounds; paste of <i>Ampelgynum chinense</i> ('Bishkatali') used for healing; roots of <i>Asparagus recemosis</i> ('Shatamuli') used as diuretic, tonic, aphrodisiac and for gastro-intestinal disorders; <i>Azadirachta indica</i> ('Neem') widely used for smallpox, malaria, skin diseases, gingivitis, sores etc., leaves of <i>Coccinea cordifolia</i> ('Telakucha') used for curing diabetes; body of <i>Cynodon dactylon</i> ('Durbaghas') used to treat bleeding from wounds, excessive menstrual discharge and chronic diarrhea; leaves of <i>Eupatorium odoratum</i> ('Asamlata') used to stop bleeding from cuts; leaves and roots of <i>Mimosa pudica</i> ('Lazzabati') used as diuretic, blood purifier and antispasmodic; basil ( <i>Ocimum americanum</i> ) leaves widely used for colds and coughs	46.7%	Both men and women as necessary; plants widely used by the floodplain inhabitants are taken into consideration

- Local name within parenthesis (multiple responses, N=15, 11 women and 4 men of lower economic group of Volarkandi village, January 2006, Volarkandi).

<sup>18</sup> If seeds are ripe, they are eaten raw. They are boiled and then eaten if not fully ripe. Ripe seeds are also sun-dried and then fried to make 'khoi'. Poor households preserve the seeds in dried form for coping during crisis periods.

Some fishers used traps (nylon nets on movement routes) and poisons (reportedly potash or potassium permanganate mixed with rice and some unknown granular poisons) for illegally hunting migratory birds (mainly northern pintail, tufted duck, wagtail, brown-headed gull and common sandpiper) for family consumption. Because of overharvest and drying out of beels for total fishing, 'Makna' (*Euryale ferox*) and 'Padmo' (*Nelumbo lucifera*) are threatened in the *haor*. A few Hindu families of the 'Volarkandi Hindu hamlet' depend on 'mud collection' from the deep basin of the *haor* during the drawdown phase of water level and sell those (whole boat as a unit at Taka 200-300, around US\$ 3-5) to households of low-lying areas. 2-3 families of the hamlet are famous for being experts in weaving and their products are costly (Taka 2000-20,000/pc, US\$ 30-300) mat 'shitoli pati' using 'pati-pata' *Clinogyne dichotoma*.

Natural capital on the coast is also diverse; there are 475 species of fish including the cartilaginous fish like shark, skates and rays, 36 species of shrimp and several other traditional and non-traditional fishery items like cuttlefish, octopus, oysters and mussels in the Bangladesh part of the Bay of Bengal (source: Fisheries Sector Review and Future Development Theme Study: Economic Performance, June 2003, cited from [www.bdix.net/sdnbd\\_org/world\\_env\\_day/2004](http://www.bdix.net/sdnbd_org/world_env_day/2004), accessed March 27, 2007). There is no disagreement among the fishers that fish catch is declining over years. I will discuss more on this issue in section 6.2.1 of Chapter Six. In case of the coastal study village, the community has access to small patches of mangrove forests lying at the bottom of the *Adinath* hill along Moheskhali channel (Figure 4.3). The same forest is shared with another Muslim fishing community of the nearby Ahmediakata village. The raised mudflat area meanwhile has been captured by a powerful Muslim businessman. Fishers, specially boys and girls and destitute women, collect shrimp seeds for sale to shrimp growers. Many families collect mud crabs from the mudflat area almost throughout the year. The *emic* view of fishers is important:

*'Mangroves play motherly role for fish and shrimps. Something 'like an umbilical cord relationship' exists between fish and mangroves... It absorbs all our 'sins'; it is like our parents, children and relatives... Nobody remains hungry in a mangrove-rich area; mangroves provide at least something for everybody in a number of ways...As the size of mangroves squeezes, our livelihood opportunities also do so.'* Arati Bala Jaladas, 47, Thakurtala, Moheskhali Island.

In a focus group discussion, fishers mentioned that mangroves serve critical purposes for them. Some of these are: shelter against cyclones (76%), fuel for cooking (71%), stabilizing land (47%), grazing areas for livestock (41%), playground and 'dead body burning spots' during ebb tide (34%), source of herbal medicine (17%), religious and spiritual values (23%), navigational significance as 'seamarks' (29%), sources of baits (mangroves ripen fruits and a small animal collected from mudflats) (17%) and livelihoods for shrimp fry and crab gatherers (35%) (see Annex 5C, plate 5C2). Ironically, many of these activities will be halted in the near future following the construction of a bridge in this mangrove area. Relatively more fishing sites are located in the southwest part of the Bay of Bengal, which correlates with the presence of the largest mangrove ecosystem<sup>19</sup> of the world- the *Sunderbans* (literally beautiful forest). Fishers call the mangroves '*Mar koler dolna*' (mother's cradle) for small fish; they observed that faunal biodiversity is much richer in the mangrove areas than in any other areas on the coast.

### 5.7. Cultural capital

*'What else I can do when I know that my husband might be lost for ever from my life after he gets on the boat.... So, I pray to God for his safe return everyday, every hour, every moment.... If you were in my situation, tell me what would you do.'* Sumati Jaladas, 40, Thakurtala, Moheskhali Island.

*'Humans can not survive without breathing (oxygen); a society can't exist and function properly without a distinct set of rituals.'* Shuvo Jaladas, 55, Thakurtala.

The term 'culture' has been interpreted in diverse ways by anthropologists based on their interests and paradigms, but often meant for the characteristic features of ways of thinking, behaving and all the things people do in their everyday existence that make certain group distinct from others. E. B. Tylor in 1871 defined culture as 'that complex whole which includes knowledge, belief, art, morals, law, customs, and any other

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<sup>19</sup> One example of ecosystem resilience and fishers' indigenous knowledge deserves attention. The devastating cyclone (SIDR) that hit the mangrove-rich southwest part of Bangladesh on November 2007 dilapidated a portion of the mangrove forest. The government decision-makers were perplexed about the recovery actions. The government experts came forward with the action of 'cleaning the uprooted and dead mangroves' followed by a plantation program. The local civil society and inhabitants of the mangrove areas including fishers suggested a 'no take' or 'no management intervention' to the non-partisan caretaker government for at least one year. The concerned advisor approved the decision in favor of the common people's wisdom. Surprisingly, the seriously effected ecosystem recovered in a year with almost no cost of the government.

capabilities and habits acquired by man as a member of society' (Cited in Peoples and Bailey 1997: 17). It is intricately linked, as a cementing element, to the formation and function of social capital of a community. Some issues related to local culture are discussed in section 4.3 of Chapter Four. In this section, my analysis will be confined mostly to rituals, as 'entry points into understanding cultural capital' (Pers. Comm. D. Johnson, June 2009) that are well-connected to fishing. Accordingly I will examine the logical underpinnings of why fishers have developed distinct sets of rituals. I would like to argue that the observances of the rituals have a profound impact on the psychological well-being of the fishers, and the rituals are framed by the immediate ecological characteristics, embedded local traditions and religious directives. I assert that the rituals observed in the fishing villages mainly centre around the notions of uncertainty and probability/luck, risks associated with the profession, and social implications.

Cultural capital, depending on the context, can exhibit enabling and empowering roles to the extent that other capitals cannot do single-handedly. This is an intangible kind of capital that is difficult and impractical to quantify. For Radcliffe-Brown, the proponent of structural functionalism, *'the functions of the different expressions of cultural system are analogous to the different parts of the body's various organs to maintain the whole social body'* (cited in People and Bailey 1997:69). The role of cultural capital in maintaining social integrity is inevitable. It can also be the basis for the maintenance and enhancement of each of the other types of capital (Kleymeyer 1993, cited in Bebbington 1999: 2034). There is a direct concurrence between the place and reproduction of cultural practices that may contribute in determining livelihood strategies; these practices are not the same as social capital although 'they do clearly depend on its existence in order to foster the conditions of social organization and spatial propinquity that allow many of these practices' (Bebbington 1999: 2034). Of all the capitals discussed here, cultural capital is probably the relatively homogenously distributed one across the fishing community. Cultural capital can exist in three forms: the *embodied* state (in the form of long-lasting dispositions of the mind and body), the *objectified* state (in the form of cultural goods), and the *institutionalized* state which confers entirely original properties on the cultural capital which it is presumed to guarantee (Bourdieu 1986: 244-249). The symbolic resources can be used to reinforce relationships of dominance or they can be

used to assert one's association with powerful forces in order to gain access to power and patronage (Pers. Comm. D. Johnson, July 2009). Human societies and cultures are claimed to adjust through subsistence patterns to a given environment, meaning that the ecological relationships are intricately linked to cultural adjustments and adaptations (Ellen 1982).

Rituals are the socio-religiously defined '*organized performance of behaviors intended to influence spiritual powers*'; these are always stereotyped, have symbolic aspects world over (Peoples and Bailey 1997: 279) and practiced to command interventions in favor. For example, the Trobriand islanders, prior to their risky voyage for collecting 'prestigious' shells from the ocean, perform magico-rituals to calm down sudden storms. Besides following all normal actions for yam cultivation, the islanders hire a magician to perform rites to prevent his yam from roaming around and leaving his garden at night (Malinowski 1935). The Chowra islanders (Andaman-Nicobar) sacrifice cocks and the blood is anointed on the heads of the boys who are taking their maiden trip (Sivakumar and Rajamanickam 1999:152). To locate caribou, the Naskapi foragers of eastern Canada heat up caribou shoulder blades and from the pattern of cracks in the scapula, they find the direction to look for game. The Hopi of the American Southwest, who believe that supernatural beings '*Kachinas*' living in the peaks of mountains, performs ritual dance wearing masks of Kachinas to bring rain for the cornfields (Peoples and Bailey 1997: 287). To study the rituals of the relatively isolated and small societies of the South Pacific, Africa and Asia, holism as a proposition considers that 'socio-cultural facts are closely interrelated and integrated into a whole, and should be analyzed in relation to contexts in which they are found, and not in isolation' (Cohen 1968, cited in Tanaka 1997: 2).

Now I will analyze the notion of ritual observances. First, I embark on a discussion of the notion of uncertainty and luck (*Vagya, Tokdir, Kopal*). '*Last voyage was a lucky one; I am unlucky, this time because the catch is so poor*'; '*It is God's dictation (hukum), does anybody know about His game? That steerer is lucky as he gets a good catch each time*'- one can frequently hear such comments in the fishing communities. There are two known vital elements in fishing: 1). the fishers with their

gear, skill, knowledge, experience, and 2). the natural uncontrollable ecosystem with a heterogeneous distribution of resources. In the coastal fishing village, skills and experiences of fishing matter when at sea, but even the best experienced fishers do not depend solely on their skills and efficient gear. Good and bad luck are inevitably present in fishing villages and perpetually in the minds of fishers. Firth (1966), from his detailed observations on the Malay fishermen, mentions that skill alone is not adequate although the role of it cannot be denied. This proposition points to the fact that the very nature of fishing itself provides the logical underpinnings for adopting special rituals. Lofgren (1989: 55) argues the phenomenon called 'fisherman's luck' are used instrumentally as cultural elements to express ideas about how social relations work. For the sea-going Terranova fishermen, luck is viewed as the nominalization of the logical space, or area of possibilities, wherein all the chance variations take place, and it tends to become reified as a cosmological entity (Zulaika 1981: 67). For the Cree hunters, divination fills in gaps in knowledge which cannot be learned from the environment (Tanner 1979:134, *cited in* Zulaika 1981: 80).

Interestingly, Michael Orbach (1977: 182), who studied the California tuna fishing fleet- the world's most capital-intensive and high-technology fishery, found that the concept of luck and the opportunities for magical manipulation of success had an important place in the world view of many fishermen; there are more examples of this kind of belief (Brandt 1972: 182, Poggies and Pollnac 1988, *cited in* Lofgren 1989: 55). The varied abundance of fish spatially and temporally, and the probabilistic assumption of variation in catch per unit effort (CPUE) is culturally translated in terms of personal attributes like luck that is perceived as something quantifiable with positive (lucky- '*vagyabaan*', '*mach kopailla*') and negative labelling (unlucky- '*Kufaa*'). Relevant goddesses are believed to bestow good luck on fishers and boats, meaning that luck is perceived to be in one's favor through observing socio-culturally appropriate rituals.

The second notion of risk (*bipod-apod, durjoge*) is central to the observance of many rituals. The anxiety-ritual theory, attributed to and popularized by Bronislaw Malinowski (1948) through his seminal works with Trobriand fishers, reveals that observance of socio-culturally appropriate rituals bestow with to alleviate humans of

otherwise irreducible anxiety. He states: *'It is most significant that in the lagoon fishing, where men can rely completely upon his knowledge and skill, magic does not exist, while in the open-sea fishing, full of danger and uncertainty, there is extensive magical ritual to secure safety and good results'* (Malinowski 1948: 30). Some other scholars put forward correlation between the amount of ritual behavior and economic risks (Lummis 1983, 1985; Clark 1982, Mullen 1978) and personal risks (Poggie and Gersuny 1972, Poggie and Pollnac 1978, *cited in* Palmer 1989). The positive relationship between the number of taboos and days involved in a fishing trip points to the fact that the greater amount of risks associated with trip fishing results in anxiety, which is lessened by more extensive ritual behavior (Poggie 1980, Poggie and Pollnac 1988, Pollnac and Poggie 2008). On the Pacific island of Ifaluk, Burrows and Spiro (1953) found no ritual associated with farming, in contrast to extensive amounts of magic associated with ocean voyages and canoe construction. Lessa (1966) mentioned that long sea voyages from the Micronesian Island of Ulithi are associated with extensive magic while short ones have none and there is no ritual associated with shellfish collection at all. Firth (1967) reports that spear fishing on Tikopia in Polynesia has no ritual possibly due to less uncertainty and greater visibility of the prey (*cited in* Poggie and Pollnac 1988: 67). Palmer (1989) hypothesizes that taboos play significant roles in promoting solidarity and cooperation among the crews by communicating sense conformity towards the traditional patterns of authority. Malinowski's classical functionalist explanations pave linkages between the vastness of the marine ecosystems and the fishers' perceived insecurity, psychological depression, and physical vulnerability.

Certainly fishing in the sea is highly risky, especially for those fishers who lack the very basic safety and communication appliances like buoys on their small mechanized or non-mechanized boats. Observances of rituals and submission to the God(s) presumably act as a psychological vehicle to get rid of possible causes of danger. Since anxiety can reduce many individuals' ability to function effectively in dangerous and highly unpredictable situations, religion and/or superstition may have adaptive value for the individual (Poggie and Pollnac 1988: 66). Some fishers believe that rituals and religious austerities generate divine power (*Daiva Shakti*) among the devotees, which they can feel through manifestations of spiritual feelings. Based on field observations, I

argue that the frequency of rituals and degree of risks and uncertainty are linearly correlated; with the increase in the former, the observance of rituals escalates. Within the diverse ritualistic domain of Hinduism, the seafaring caste-based fishers have developed their own distinct rituals. Those who fish in the deep sea are typically inclined to the deity '*Ganga*' (see Annex 5, plate 5C1), and those who fish in shallow waters or in relatively risk free areas are inclined to other goddesses. With the vigor and cordiality, the deity '*Ganga*' worshipped by the seafaring coastal fishers is unthinkable to the floodplain Hindu fishers of the same or different castes. The floodplain Hindu fishers of Pabijuri village observe low-cost plain worship of both male and female deities such as '*Bishnu, Krishna, Narayan and Laxmi*'. These observations clearly conform to the argument that the degree of risk is an important determinant in picking the types of goddess and the frequency of rituals observed.

The special rituals observed by seafaring fishers sharply differ with the cultural language of the rural peasant ideas of Bangladesh. Some of the rituals I observed in the field are exclusively observed by the sea-going caste-based Hindu fishers who have adopted a local form of Hinduism, rather than the regional or peninsular Hinduism. Srinivas (1952, *cited in* Tanaka 1997: 3) argues that Sanskritic and non-Sanskritic rituals and beliefs are disproportionately distributed among the various castes; as we move down the caste hierarchy from the high-caste Brahmin to the so-called untouchables, the Sanskritic elements of Hinduism gradually diminish. The observance of rituals at the family and community levels is of profound importance in reinforcing and making the seafaring Hindu fishers emotionally ready for the 'call from the sea' and also maintaining their impulses, emotions, social and psychological coherence in a world characterized by a plasticity of risks, uncertainties and death.

There are social implications to the observance of rituals. I argue that beyond the individuals' psychological bearings, the observance of rituals also renews and reaffirms social relations, and hence the observance of some public rituals manifests relationships of socio-political power. The observance of typical rituals strengthen the commonly shared ties and moral values, thus strengthening the 'mechanical solidarity' (French scholar Emile Durkheim used this term) within the community through building up a collective conscience and group feeling (Arab philosopher Ibn-Khaldun used the term

'asabiye' to mean group feeling). Within a fishing unit, Palmer (1989: 67) argues that crew members communicating an acceptance of the taboos endorsed by the skipper simultaneously communicate sense of willingness to accept the authority of the skipper.

Most of the studies on village festivals ignored socio-political implications of rituals and festivals. Though it is usually perceived that social conflicts and tensions are redressed through rituals, I observed that some festivals help to renew and reiterate political relationships at the local level. Tanaka (1997), observing the rituals and village festivals of the Tamil fishermen of Chattiur village of Puttalam district in Sri Lanka, argues that Hindu festivals not only emphasize the communal or egalitarian aspect of the society, but also serve to legitimate a political structure. Festivals form a field where political relationships are continuously reiterated and partly legitimated, in relation to culturally bound meanings (*ibid.*: 19). Wolf (1966:101) puts forward an exploitation dimension of rituals and religious analyses; his proposition for peasants can be paraphrased for fishers also:

*'The tasks of linking the [fisher's] variant of religion is the work of many hands and minds, a many-stranded network rather than a direct submission... Where the [fisher] is apt to take ritual as given and to accept explanations of ritual actions that are consistent with his own beliefs, the religious specialist seeks the meaning behind meanings ('explanation of the explanations'), engages in the labour of examining symbols and rituals, exploring meanings behind meanings, striving to render meanings and actions more consistent... The two levels of explanation and ritual action can exist side by side, interpenetrating and complementing each other'.*

Having analyzed the notions behind developing specialized rituals in the fishing culture, I will briefly discuss the deep-rooted values associated with fish in the cultural, historical, social and economic arena of Bengali life. Fish heavily entail certain roles from the birth to death of an individual. Das (1931, 1932) provides a valuable account of the utility of fish in different rituals and festivities. The cultural history of Bengal adduces certain evidence in support of the fish consuming habit of the Bengalese. Fish play an important role in maintaining community cohesiveness and boosting rural economy<sup>20</sup>. It simply symbolizes something as a 'sacred or godly item' in the Bengali

<sup>20</sup> In some wetlands, especially in the Pabna district (*Cholon beel, Gerakari beel, Tafigari beel, Sonapatar beel, Chondipakar beel* etc.), the annual fish catching festival (locally known as *Baoa* or *Hatai*) is organized by local leaders. Drums are beaten or miking carried out to convey the date; people from surrounding areas get ready with different gear; relatives visit those beel areas; rural artisans sell numerous

rural culture. In the Hindu social marriage ceremony, fish like *Hilsa ilisha*, *Catla catla*, *Labeo rohita* and *Puntius* sps. are exchanged between the families of the groom and bridegroom. Some families are known to dress up the fish with earrings, garland and decorate them with different dyes, and finally wrap them up in colorful clothes before sending them to the groom's family. Some money is put inside the fish's mouth in honor of those who will process the fishes. 'Gojar' (Murrel, *Channa marulius*) and turtles are considered sacred in the 'dorgah' (shrines) of 'Hajarat Shahjalal' in Sylhet and 'Bayejid Bostami' in the Chittagong district respectively.

The caste-based Hindu fishers believe that catching fish is their birth-ascribed right. They hold that '*souls of the fish caught by 'Jaladas' fishing castes will find rooms in heaven*'; they also believe that fish are not aware of the nets and other preparations by fishers for catching them ('*Mache na chine jal, manushe nachine kaal*'). This view differs from Firth's (1966: 122) observation on the Malay fishermen, who believe that '*fish are not unconscious of the activities and intentions of the fishermen even at a distance*'. The Hindu fishers consider the sea as a 'female entity', expressed through 'bodiliness and subjectivity' of the sacred 'mother and the goddess *Ganga*'. In local epistemology, 'excited sea' (*sagor*) is cooled down 'sexually' by the 'monsoon water' from the 'surrounding rivers' (viewed bodily as male), to produce 'offspring' (fish) in the water. Such strong Hindu religious interpretations among the coastal fishers are absent among the floodplain fishers of the same religion. Traditionally, the sea exalts a special spiritual position to the wider Hindu fishing communities, and thus evolves numerous sets of rituals. Both Hindu and Muslim fishers interpret that '*boats and nets are not mere timbers or threads, but sacred enlivened objects for carrying humans and catching fish in the sea*'. The process of sanctification and keeping the objects sanctified<sup>21</sup> through rituals are very important to both religious groups, as they perceive if objects are

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products in the rural fair or 'aarong' surrounding fishing areas. Such rural festivals are threatened as beels are increasingly been leased out to powerful elites.

<sup>21</sup> Hindu fishers never urinate from the anterior portion of boat; they believe the '*Goddess Ganga stays in the forehead of boat*'; Muslim fishers gather their urine and stool on a plate and then throw away on water; direct defecation is perceived to agitate the water-saint '*khoaj-khijir*'. Slime, blood and other wastes on the deck are washed carefully everyday by crews to keep the boat 'pure'.

sanctified, the catch will be abundant and evil spirits will be simultaneously placated down.

In this section, I will briefly analyze the rituals observed by artisanal fishers which are integral to their profession. With utmost devotion, the seafaring caste-based Hindu fishers observe the worship of '*Ganga*' (a nice-looking deity with four hands, sitting on an imaginary marine animal '*Mokor*'), that is widely believed to save their lives in the sea and also enhance the catches. Muslim fishers also show respect for the deity '*Ganga*' and as well as *Bonodevi*, the Goddess of the Jungle. Hindu fishers also widely respect the Muslim saints '*Gazi Kalu*', '*Khoaj Khijir*', '*Malek Shah*' and '*Akbar Shah*'. Such instances of inter-religious practices speak of the communal harmony and peaceful coexistence among the fishers across their religious divides. Wealthy boat owners buy idols of the deity *Ganga*. On a lunar day fixed as per almanac, the priest completes the worship using essential ingredients like paddy grains, coconut, vermilion, 5 types of cereals and twigs, basil leaves, milk, betel leaves and nuts. Once the uttering of the hymns and lyrics (*Ganga stoatra*) is over, the priest performs a fire sacrifice (*Homa jaggya*). Holy water is sprinkled to sanctify the boats and nets. The painted eyes of the deity *Ganga* at the anterior end of the boat are enlivened by putting mixture of coconut oil and vermilion (*tel-sindhur*) on the pupil. The fishing boat decorations<sup>22</sup> deserve a detailed analytical treatment. Worships of other deities are mentioned in Appendix Four.

Let me now discuss the rituals observed by floodplain Muslim fishers. They observe very few rituals as they fish in relatively risk free areas. They clean the boats and

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<sup>22</sup> The anterior (prow) and posterior parts of many of the coastal fishing boats are nicely decorated usually with floral motifs, symbolic religious expressions and identity marks of the owners. Verrips (2002) pointed out that 'fishers tend to treat crucial means of production (boat) not as sheer objects, but instead are inclined to transform them into a specific kind of subjects, companions or collaborators, for instance, by decorating them abundantly and giving them names and sometimes food. The decorations are very succinct and symbolic expressions of a wide range of relations, identifications and sympathies of their owners/users with things, fellow human beings and ideas'. Examining the iconography carefully, it is easy to distinguish ownership patterns, cultural identities and mindscape of the fishers. Floral motifs with a carving of 'Conch' in the prow, painted eyes of the Goddess '*Ganga*' at the lower end of the anterior portion and nomenclature of boats with goddess names (*Ma Ganga*, *Ma Laxmi*, *Vobotarini*, *Ma monosha* etc.) are characteristics of Hindu fishers' owned boats. Some boats owned by Muslim fishers are seen to have painted '*Bismillahir Rahmair Rahim*' (appreciation to Allah), hoist green flags with a moon and star (symbols of Islam) and have religious slogans symbolizing '*Allah's gift*' (*Allah'r daan*, *Allah sohay*) and power (*Iah Ali*, *Iah Rasul*). In the case of all fishing boats, only morally significant and emotionally serious types of messages are observed. I did not notice any vulgar or sexually motivated message or obscene pictogram or slogans for boat decorations, as is the case for some Ghanaian fishing canoes (Verrips 2002: 57).

gear, wash the anterior part ('golui') with three buckets of clean water and then cover up the 'golui' with clean clothes. On Friday, after the 'jumma prayer', the priest of the local mosque (*imam/moulovi*), owner of the boat, and local seniors gather near the boat. The priest utters certain hymns like 'doa Kunnut', 'monajat', 'sura ayatul kurshi', 'sura aklas', 'sura fateha', etc. from the Quran. Just prior to stepping on the boat, they say a prayer concertedly (*Rabban jalamna anfumana wahillan anta ferri, wataar haamna laana kunaanna minaal jamiri*) seeking blessings from the almighty Allah; afterwards some food is served. Muslim fishers strongly believe in the existence of 'jenes/vhut' (supernatural effigies, also locally called 'rakhal' to mean cowboys) in the *haor*. Both Hindu and Muslim 'jenes' with male and female categories are perceived to exist. We get similar cultural beliefs from the South African *Xhosa* people who believe their ancestors resided beneath the water as the 'river people' or 'Abantu bomlambo' (Van der Wall 2000). Diegues (2002) argues the religious beliefs of Brazilian artisanal fishermen, particularly in the Amazon, are influenced by the Indian mythologies and legends. Fraser (1966) mentioned the Muslim Malay fishers of southern Thailand believe in the existence of nature malevolent 'hantu'; additionally they believe in 'semangat', the soul-substance or vital force believed to be present in all living things. Interestingly, this concept of 'semangat' is similar to the 'aatma' (immortal soul) philosophy of the mainstream Hindus.

Fishermen, especially those who remain at sea for weeks and months, are seen to develop and maintain 'two cultural entities', one for the wider landbased social organization, and the other centred on their 'stay and activity' on the boat in the sea. The same fellow may behave quite differently at sea and on land. The fact that coastal fishers are drastically different in many aspects of technology, perceptions, behavior and culture is attributed to the reality that they remain geographically and emotionally isolated from families and society for a long time. His hour-to-hour psychology is primarily dominated by tension for a good catch, a longing for returning home, unknown threats from surroundings and fatalistic aptitudes. Neither of the two cultures is transient or dissoluble to each other, but rather complimentary and intimately supportive.

### 5.8. Political capital

*'This project (ECFC) ignited us, inspired us, united us...however, a short duration project is like 'offering a teaspoon of water to a thirsty man'; the planners and donors should know that empowerment does not take place overnight. I am afraid, after this project phases out, the government officials will treat us as 'Jailla' (Fishers), not as human beings. We have wait decades for real change,' Anar Koli Jaladas, Cox's Bazar*

*'If the fishers of Hakaluki haor know that Nurul Chairman is bidding for a certain waterbody, nobody will dare to compete....here everybody knows, along with financial power, you also need group of thugs to control jalmohals. Poor fishers can't manage larger waterbody without sincere support from local administration.'*  
Dilip Kumar Saha, Upazilla Fisheries Officer, Baralekha, Moulavibazar.

Political capital is defined as an endogenous asset that holds the power to connect an individual or a group to higher power structures and policy instruments outside the domain of own territory (Baumann 2000). It explains well where the local communities are situated in terms of holding, balance and exercise of political power in relation to other groups in a certain locality. This section will briefly examine the efforts of two contemporary projects from the community empowerment point of view, and then provide an analysis of the perceived roles of different institutions. For the fishing communities, active participation in socio-political institutions and empowerment as a strategy is more concerned with access rights, entitlement, socio-economic capacity building, and raising consciousness about proper management of environment and resources. The line of argument is that without a major change in the political culture, institutions and overall governance of the country, political empowerment of disadvantaged communities like fishers is unlikely to occur.

Before I proceed with a discussion on the aspects of political capital, it is worth noting that the political culture of Bangladesh is characterized by autocracy, intolerance and arrogance, lack of responsible governance and democratic values, and serious rivalry among political parties. Both the political capital and macro-level political culture exert differentiating impacts on the well-being/ill-being of the fishers. Hooligan-based political agitations heavily impact<sup>23</sup> the social and livelihood security of the fishers. Coastal

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<sup>23</sup> Just to mention an example: fish being a highly perishable commodity and given the poor availability of ice, a 2-3 day long countrywide transport strike and similar political agitation programs compel fishers to sell their goods at extremely low prices or even discard their catches. Many of the fish landing centers are controlled by strong groups of thugs who have almost absolute control over the price of the fish.

fishery in Bangladesh is open access and the wetlands fishery in the study area is subject to a leasing process for enjoying the property rights. Invariably, in both situations, the access to common property, as well as the continuity of the fishing profession, is well-connected to a political and institutional mechanism.

I argued in the discussion on fishantries (section 4.2.1 of Chapter Four) that fishers, because of some unavoidable realities, failed to be organized and did not raise their voices. Sen (1990) recognizes that entitlements are differentially distributed in a community and the holding of differential entitlements can be a locus of negotiation and contestation between individuals and households with different objectives and decision-making power. Such power is typically extremely skewed, and is likely to be a source of tension and conflict for members of a community rather than coming to a consensus (Devereux 2001). Empowerment through participation in socio-political processes goes back to the civil rights movements of the 1960s in the west, and consciousness building efforts and adult education principles of Brazilian philosopher Paulo Freire (1968). As an issue and process of 'learned hopefulness' (Zimmerman 1990), it is only recently emerging in the area of fisheries management. It is indicative of a process through which relatively powerless people attain some degree of socio-political power they can exercise in a favorable environment to gain, maintain and uphold entitlement over their means of basic livelihood. Chambers (1983, 1997) and many others (e.g., Friedmann 1992) have stressed the poor people are usually unorganized and have low level of socio-political organization and their capacity to make their voices heard is consequently feeble, pushing them towards exclusion from political and decision-making process (*cited in Bene 2003*).

In the case of common property resource management, community empowerment can be stimulated through co-management, as it involves the excluded, disenfranchised, and sometimes alienated user groups and stakeholders into the management decision-making process by rearranging power and responsibility. Indeed, it is widely recognized that the enabling process of community empowerment is a pre-condition for and outcome of fisheries co-management efforts; if there is no empowerment at individual and collective level, there is no successful fisheries co-management (Jentoft 2005). *'An empowered person is one who has the ability to understand the forces that are impacting on himself or herself, who can analyze a social and political context critically, and who*

*knows how to act in situations that demand a response'* (Ibid: 3). Deshmukh-Ranadive and Murthy (1997) argue that empowerment is a socio-political process which emanates in situations wherein issues of inequality gradually moves towards becoming an equality; they argue the inequality that transforms to equality is the product of inequality in participation in the various actions of development. Empowerment creates space for individuals with varying quantity and quality. Space is a concept to capture the notion of power and empowerment. Every person has an allotment of space at a moment in time. Space can be physical (women's mobility from domestic to public spheres), economic (access and control over goods), socio-cultural (ideology, norms, values, status, class, caste, gender) and political (authority, power dynamics) determining a person's capacity and behavior (Deshmukh-Ranadive and Murthy 1997: 48).

Community empowerment is also viewed as a *'social action process that promotes participation of people, organizations, and communities towards the goals of increased individual and community control, political efficacy, improved quality of community life, and social justice'* (Wallerstein 1992, cited in Jentoft 2005: 3). From my practical engagement on the empowerment of fishing communities, I view empowerment as a holistic theme and process that embodies psychological, social, economic and political advancement of individuals and/or communities who 'relatively' fall behind the expected level of development. Using this theoretical position, we may assume that fishers' empowerment and fisheries co-management are an intertwined, participatory process oriented and complementary to each other. Both approaches ask for some social and political space for the target fishers.

I will examine the roles of two contemporary projects in community empowerment. Obviously the question arises: what is the role of the Department of Fisheries (DoF) of the Government of Bangladesh as the officially designated agency for the empowerment of fishers? So far, DoF did not develop any institutional mechanism to manage the fisheries resources involving the fishers, except implementing two development projects in recent years. The two projects under consideration are the ECFC (Empowerment of Coastal Fishing Communities for Livelihood Security, GoB/UNDP/FAO project: BGD/97/017, year 2001-2006) and CBFM-2 (Community Based Fisheries Management- 2<sup>nd</sup> phase, 10 years long starting from 1995, implemented

by WorldFish Center and DoF and funded by UK-DFID). The development objective of the ECFC project was to promote livelihood security for the poor coastal fishing communities through a well-connected process of socio-political empowerment, economic empowerment and involving fishers in the resource management efforts of the government, while the CBFM-2 aimed at allocating waterbodies to (and better management of the same) fishers' groups through institutional collaboration with the government. Here Thakurtala and Volarkandi fishing villages represent the ECFC and CBFM-2 projects respectively.

For an independent examination of the trend of the functions of community-based organizations (CBO), I developed a set of indicators common to the activities of the said projects in consultation with fishers. I carried out two exercises in participation with the general members of the CBOs; I excluded the CBO leaders purposively to eliminate their influence. Each question or issue was discussed thoroughly by the community members, and they finally come to a consensus with a score. The scores and set of indicators are shown in Table 5.12. It is understood from the sustainability trend of the two CBOs that the coastal CBO might go a long way if proper cooperation from local DoF officials is continued and there is no major conflict in leadership while the floodplain CBO showed symptoms of unsustainability during the project phase, let alone sustainability of the CBO after the project's withdrawal. These results, based on only two village-based CBOs, cannot be generalized as indicative of the overall performance of the projects.

However, the approaches were fundamentally different. The ECFC considered a process of succession with the realization that a community that is not capacitated socio-politically and economically cannot be in a position to argue for their rights of participation in resource management along with government agencies and other stakeholders. The CBFM-2 worked directly for community participation in wetland resource management assuming the fishers are in a position to sit with the stakeholders at the same table. Given the holistic nature of the process, the ECFC mobilized all departments and agencies working at the upazilla level including local and land administration, agriculture, police, coast guard, DoF, education, social affairs, youth affairs and public health engineering departments. In contrast, the CBFM-2 worked more

closely with local and land administration and DoF. In the case of Volarkandi village, 2-3 CBO leaders with linkages to concerned NGOs and local administration could sense the route 'to do' for the leasing of small beels. They could lease a small beel and then sublease it without consulting CBO members. The selection process of the community leaders was not at the will of the general members, but at the influence of the concerned NGO personnel. For co-management and empowerment to work, sufficient action for sensitization, awareness building and organizational strengthening is pre-requisite and the CBFM-2 had clear strategic gaps in the design process for fulfilling the requirements.

In case of the ECFC, the community-based Village Organizations (VOs) were not formed overnight; fishers were sensitized about existing problems and the project emphasized capacity building through a self-realization process. The ECFC project adopted the principle of *working with the people*, with a major shift from the usual incentive driven developmental approach that is easy to accomplish but fast in losing its ground. While this approach minimized the importance of material and financial assistance/grants, it maximized the sustainability of the development intervention in the long run. Conscious efforts were made towards making the fishers realize their own potentials, regaining their confidence, and finally inspiring them to think and walk along a development path of their own.

The ECFC project significantly contributed in building socio-political capital through community mobilization, enhancing income generation opportunities for men and women, primary education enrollment for children, capital generation, legal awareness, making communities prepared for disasters and networking. The male and female fishers of Thakurtala participated in the development interventions of the ECFC project in a spirited way. The analysis reveals that the possibility of sustainability in case of Volarkandi village-based CBOs is nominal (average score is 1.73 on a scale of 5); however it is expected that the Thakurtala village-based VO would sustain itself in the long run (average score 2.86 on a scale of 5) if the village leaders sincerely wanted to do so.

**Table 5.12: Impacts of development projects on target groups as assessed through participatory exercises with 30 coastal fishers and 12 floodplain fishers (scale: 1- minimum, 2-progressing, 3-modest, 4-satisfactory, 5-sustainable/excellent)**

<b>Empowerment indicators</b>	<b>C</b>	<b>F</b>
<b>A. Social and institutional indicators</b>		
A1. Social inclusion: size of CBO members (as % of total households of the village)	5.0	1.0
A2. Awareness level of general members on social issues	3.0	1.0
A3. Functioning of CBOs (periodicity of meeting, participation, decision-making, sharing of information, account keeping, transparency, accountability, conflict management)	3.0	1.0
A4. Quality of CBO leaders (honesty, sincerity, dedication, social acceptance, participation in social events, involving other members in decision making, personal sacrifice)	3.0	2.0
A5. Plan and vision of CBO (ideas, vision, prepared development plans and steps taken)	3.0	2.0
A6. Democratic environment (application of democratic principles, election process, transparency, extent to which general members take part in decision making, etc.)	3.0	1.0
A7. Facilities developed for organizing community meetings; discussing issues/matters related to organization, social and religious; sharing information and storing documents	3.0	1.0
A8. CBO members represented in local, upazilla, district and national level institutions	3.0	3.0
A9. Frequency of interactions among CBOs and between CBO and higher level institutions	3.0	2.0
A10. Common/collective/joint programs with other CBOs	3.0	1.0
A11. Role of women in decision-making process in family affairs ( financial, non-financial)	3.0	1.0
A12. Linkage between CBOs & GOs (participation of GO agencies in CBO-based activities)	2.0	2.0
A13. Linkage between CBOs and NGOs (participation of NGOs in CBO-based activities etc.)	3.0	3.0
<b>B. Economic indicators</b>		
B1. Savings (amount, regularity, quality of account keeping, utilization, etc.)	3.0	1.0
B2. Grant mobilization by CBOs for organizational/community welfare	3.0	1.0
B3. % of people taken loan from moneylenders (higher percentage lower score)	2.0	4.0
B4. % of people taken loan from micro-finance institutions (Higher percentage higher score)	3.0	2.0
B5. Level of diversification and households incomes (higher score for increased income)	2.0	1.0
B6. % of CBO members trained (by project) and involved in alternative income generation	3.0	3.0
B7. Project supported individual income generation enterprise (higher % higher score)	3.0	2.0
B8. Value of total household assets increased / decreased (higher score for increased asset)	2.0	1.0
<b>C. Resource management and ecological indicators</b>		
C1. Participation of fishing communities in participatory exercises on the fisheries resources and habitats, and identification of prioritized fisheries and their management need	4.0	2.0
C2. Awareness about biodiversity, conservation, sustainable use of resources and habitats	4.0	4.0
C3. Ability to identify destructive fishing gear and practices and agreement at CBO level	3.0	3.0
C4. Level of awareness about fish acts, regulations and administrative orders	2.0	1.0
C5. Level of compliance of existing fishing acts, regulations and administrative orders	3.0	1.0
C6. Trend of reduction in the use of destructive gear and practices by CBO members	3.0	1.0
C7. Extent to which modifications/improvements have been made in locally used gear for making them less destructive	3.0	1.0
C8. Village level initiative and activities for the implementation of village action plan for conservation & management of natural resources	3.0	2.0
C9. Extent to which CBO members are aware of decisions /action plans prepared by NGO	3.0	1.0
<b>Total score</b>	<b>86</b>	<b>52</b>
<b>Average score</b>	<b>2.86</b>	<b>1.73</b>
<b>Sustainability trend</b>	<b>→↑</b>	<b>↓</b>

*Source: Participatory exercise with fishers to assess performance of their organization, carried on 19-4-2006 at Thakurtala and 28-4-2006 at Volarkandi. Weighted average values are agreed upon by the fishers on consensus basis.*

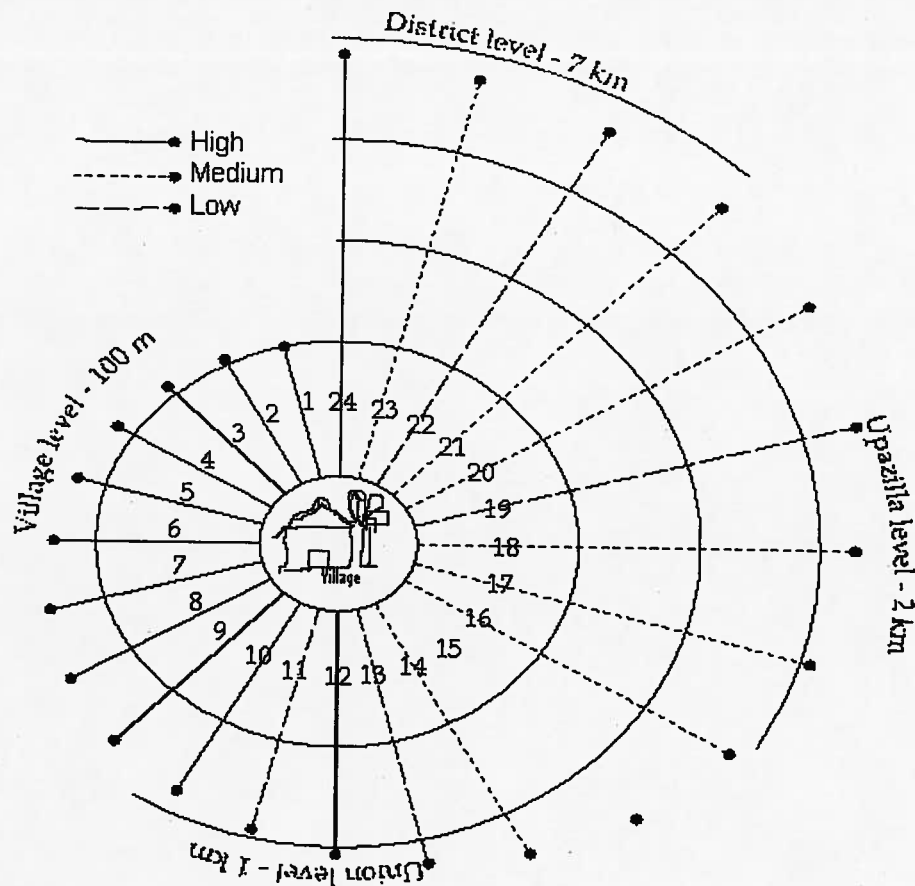
From the field work, I realized that given the chaotic socio-political and demographic context of Bangladesh and the fishers' existing socio-political and

economic capabilities and level of consciousness on resource management, a fishing community alone cannot manage wetlands. Fishers' true empowerment lies in the fact that they gain meaningful livelihood strategies and manage resources sustainably with meaningful cooperation from government agencies and other stakeholders. Support and cooperation from the government administration is essential. The legal back-up for relegated communities like fishers is especially very important as they might be threatened by powerful non-fisher elites when conflicts over the resource continue.

The role and attitude of individual government officers is very important for the sustenance of these CBOs; some officers have been very cooperative and sympathetic towards the relegated position of fishers. As agreed with the government, it is ultimately the role and functions of the DoF to carry out the activities of co-management and community empowerment activities in the absence of projects and NGOs. In most of the cases, such functions erode or stop as the incentives from projects wither away. It is obvious that although the government is hypothetically supportive of local level actions, it does not provide basic support, money and ancillary facilities to mobilize the communities. One government officer comments:

*'It is more a sort of co-management between DoF and land administration, between DoF and NGOs; fishers are 'invited to attend' some meetings after the government officers have already made some decisions. Look, who wants to surrender authority and power? Without that an officer is useless and powerless. I feel bad to think that the fishers might not be called on forums after the exit of the project and NGOs... Once the project is over, I seldom have communication with the fishers as I don't have any budget and logistic supports for monitoring the activities. Again, the system is such that if I do too much work honestly for the fishers, my seniors will be suspicious about me and they will start official enquiry.'* (Government Fisheries Officer, identity screened, Sylhet, 12-3-2005).

Figure 5.9 illustrates the perceived role of different institutions in affecting daily life of fishers of Thakurtala. It is evident that the ECFC project and village-based institutions, such as traditional leadership, moneylenders and the religious temple, had significant impacts on the villagers, while the government service providing institutions based at the cross-scale level had nominal influence. Exceptionally, among the district level institutions, the District Fisheries Office had a profound influence on the fishers and it was largely attributed to the individual officer working in such offices.



*Institutions: 1. ECFC project, 2. Village leadership or 'sardery', 3. Boat owner, 4. Money lender, 5. Middlepersons, 6. Village Resource Centre (VRC), 7. Primary school, 8. 'Adinath' Temple, 9. Local shopkeepers, 10. Union Parishad/chairman office, 11. Cyclone shelter, 12. Local market, 13. Land office, 14. High school/college, 15. Local hospital, 16. Upazila fisheries office, 17. Public health engineering office, 18. Education office, 19. Police, 20. Upazila administration, 21. Navy/coast guard, 22. BFDC fish market, 23. DC office/ tourism, 24. District fisheries office.*

**Figure 5.9: Role of cross-scale institutions on fishers (Based on FGD 17Aug.2005, Thakurtala)**

In Thakurtala fishing village, the ECFC project provided general membership to all residents of the village irrespective of economic status, but in the executive committee, the powerful elites and moneylenders were sidelined with the notion of bringing a balance in power and decision-making (see Annex 5C, plate 5C6). This has helped tremendously in raising the voice of the common fishers who are generally characterized as reluctant in different meetings. Excluding the 'civilian labor force' consisting of under-aged and old persons, around 65% of able-bodied villagers had the opportunity to participate in some socio-political institution.

### 5.9. Discussion

This chapter examined fisher's capitals, their capabilities, and social 'functioning' (to use Amartya Sen's term) and it is apparent that a great many people are unable to live the kind of lives that they might want to, and such lack of capabilities makes them vulnerable to various types of stressors (Seeley et al. 2006). These capitals are location specific, highly subjective and evolving; they vary in terms of value, quantity, quality, access, rights, control, and perception between individuals and communities. Generally, fishers possessing multiple numbers of capitals are more powerful and better able to gain access to the institutions of the state and market. In both study villages, livelihoods are strongly influenced by the access to and health of the natural resource base. Fishers do not always have the ability to utilize all the resources and keep them in fair balance, and hence a few particular capitals tend to be overused. Natural capital is an example of overexploited capital among all the capitals. With regard to human capital, I will assert that these small-scale/artisanal fishers represent the most important and diverse source of indigenous ecological knowledge than any other forms that the fisheries hold.

The fishers' capability can be viewed as both an end and a means. Perhaps more important, Sen (1999) argues it is human capabilities that enhance people's ability to be agents of change. Sen's comments regarding human capital can equally be made for social capital; concerted they improve peoples' aptitude to question, confront, propose and ultimately usher in new ways of doing things (Bebbington 1999). It is argued that people, using their social relations and networks, secure or enhance the benefits from multiple capitals by transforming, exchanging, selling or loaning that allows them to augment their income streams and commodity bundles (*Ibid*).

The deprivation and social inequalities generate 'social poverty' and marginalization, and if this process continues in a persistent manner, the likelihood of becoming marginalized (materially or socially) would obviously increase (Ferge 1987). Common peoples' ability to access multiple capitals is greatly influenced by their capability which is usually dictated by the ownership of their initial endowments. It is important to examine and understand the conditions under which poor people with very limited endowments may be able to mobilize resources operating at different spheres, and

the ways in which institutions may begin to act more in favor of such assetless groups (Bebbington 1999).

This chapter revealed that poverty in the fishing villages is not only a product or manifestation of material deprivation, but it intimately links to a set of micro-meso-and-macro level interlocking factors. These range from bodily flaws to household capabilities and resource endowments, labor force compositions, social exclusion, powerlessness, governance crises, status of formal and informal economies, political instability and others. It is evident that Thakurtala is absolutely a land-scarce village, and hence drawing additional income from agricultural activities is impossible except for scanty household level gardening. They are mostly dependent on harvesting from the coastal areas, and the dwindling nature of catches followed by the seasonal aspects of fishing and the exploitation therein keep them arrested in the poverty cycle. So it is argued that poverty is not only 'capability deprivation', but also it links to a host of cross-scale natural and human-made factors of which the fishers have hardly any control. Cross-scale institutions are not in favor of fishantry, and there is the strong likelihood that the disparities within the sector would continue to increase unless serious attention and political commitments are geared towards the poor fishers.

The poor are often viewed as both victims and agents of environmental and resource degradation. On the coast, I observed that the shrimp farming industry controlled by the politically powerful wealthy class provoked a massive destruction of the mangroves. The massive fry fishing, brooders harvest for and pollution from hatcheries and the industrial trawler owners show little compliance to fisheries regulations. Fishing is a seasonal occupation, and the scope of alternative income outside the village is also very limited. Hence the financial capital base of the fishers is generally very poor.

In Volarkandi village, dependence is spread over both fisheries resources and also agriculture; the possession of land is higher than that of Thakurtala. Remittance flow is limited to a few families and the poor fail to make the initial investments needed for overseas migration. Remittance flows failed to generate labor-intensive industrialization, but rather competed with the poor resource base. The forces of globalization and the increased demand for internationally valued species like tiger shrimp (*Penaeus monodon*)

are apparent, and their local level consequences are also felt seriously. It must be mentioned here that no single approach can solve all the predictable and unpredictable problems emerging from globalization and other grounds, and hence enhancing collaboration among multi-level governance institutions operating from local to international is critically needed (Berkes et al. 2006). From the case studies on the empowerment and resource management process adopted by the ECFC and CBFM-2, it is apparent that power relations are critical in the rural contexts.

Fishers are rich in terms of their own culture and indigenous knowledge capitals. How the traditional knowledge is transferred through generations is a matter of deep and long investigation. Rural people are 'situated agents' as they are enthusiastically engaged in the generation, acquisition and classification of knowledge, and they are situated because such engagements take place in cultural, economic, agro-ecological and socio-political contexts which are the products of local and non-local processes (Howes et al. 2004). Understanding of the social learning and cultural evolution based on a gradual accumulation of indigenous ecological knowledge is essential for local-level resource management (Berkés 2008). It is hypothesized that belief or ethics is the 'slower variable' in a knowledge-practice-belief complex (*Ibid.*: 247). I believe the pressures emanating from survival crises expedite the process of building the knowledge base or human capital as 'prompt variable'.

The next chapter will deal with the vulnerabilities faced by fishers, their coping strategies and actions for livelihood diversification in detail.

## Chapter Six: Complexities of Livelihoods: Stressors and Coping with Adversity

### 6.1. Introduction

*'The limitation of other animals is that they cannot change their positions. A dog is a dog for ever... Human beings can do that and take up the positions of evil animals; a man can be poisonous like snakes; a man can be a blood sucker like 'leech'; a man can be cunning like a fox; a man can be like a man-eater tiger. You see all these animals around fishing villages.'* Kamini Jaladas, Thakurtala, 50, Moheskhali Island.

*'There is none for poor; poor is hated by Creator also; He keeps us engaged in poverty and sufferings throughout the life.'* Bidhu Jaladas, 55, Thakurtala, Moheskhali Island.

*"If your son dies in 'cold attach' (pneumonia); if you are forced to cook, eat, sleep and discharge (urine and stool) on the open roof of your broken house for weeks; if you are to collect drinking water from 5 miles far every day; if you have no money to buy rice; if you see poisonous snakes around....if this situation continues for months, then you would really know what a flood means in the life of 'haor dweller.'* Minara Khatun, 40, Volarkandi village.

Poverty is an ever-increasing haunting presence - a grim reality that thousands of fishers are forced to cope with, day-in and day-out. In Chapter Four, I discussed the pertinent dimensions that impact the fishantry as a social group and their livelihoods. In Chapter Five, an elaborate discussion ensued on the multiple capitals and capabilities of fishers; it was apparent that a vast majority of the fishers are poor, especially in terms of economic endowments. For the fishing communities, poverty is multi-dimensional with cross-scale connections to the resource base, social (exclusion, prejudice, racism and caste status), economic, institutional, political, governance, geographical, environmental and cultural roots. Livelihoods dependent on a complex natural system like artisanal fishery are destined to be complex. This chapter will examine the various processes and attributes that have impact on fishers' livelihoods, along with the coping strategies employed by fishers. Throughout this chapter, two major arguments are put forward taking an analytical angle of vulnerability and uncertainty.

The first line of argument is concerned with the multiple sets of vulnerabilities together with seasonality, debt and lack of alternative sources of income that singly or synergistically impact the family well-being and livelihood resilience. Some forms of vulnerabilities are rooted in natural systems and are geographically destined, which exert a pressure on the whole communities irrespective of class, caste, ethnicity, age and gender with differential effects. Yet others are socio-culturally induced, where we usually see two sets of audiences: the small powerful group who knowingly or unknowingly creates and maintains stresses, and the majority of the powerless groups who suffer the

consequences. The multiple sets of pressures act as 'social selection' (like that of natural selection proposed by the evolution theorist Darwin), whereby a group becomes successful, while a vast majority becomes negatively affected (see Annex 5D).

The second line of argument is that the coping mechanisms involve some implicit principles or self-provisioning actions that households are forced to do or choose under given sets of unusual and abnormal stresses to reach certain level of functioning for survival and well-being. Broadly speaking, fishers can reduce the vulnerabilities in two ways. First, the fishantry as a whole can collectively resist the pressures. Second, they can define mechanisms at the individual or household level through actions like lessening consumption, employing more labor, diversifying income sources and seeking loans. I will focus more on the household level coping strategies. The concept of coping strategies has also connections to livelihood resilience; households with a higher level of livelihood resilience are expected to enjoy livelihood well-being and sustainability (Chambers and Conway 2002). While there are commonalities in nature and gravity, there are still remarkable variations in crises between families and among the fishing villages in different agro-ecological zones.

Complementing the second line of argument, it is asserted that given the high degree of uncertainty in the small-scale fishery, households can attain higher livelihood resilience if they spread their risks by earning from more than a single seasonal source like fishing. Now, in the face of shocks and stresses emanating from multiple sources prevalent in the artisanal fishery, the fishers, as permitted by one's adoption of new skills and social networks, are more inclined towards adopting a multiplicity of livelihood strategies to sustain basic livelihood functions. Generally fishers' livelihoods centre on the subsistence mode of income and employment. The corollary is that fishers falling below the minimum economic equilibrium with an extremely low level of income do critically risk, not only nutritional deprivation, but also their familial and social standing. In such critical stages of livelihoods, fishers and their family members exhaust all-out labor and efforts for meals and the associated desperation negatively impacts the local environment and biodiversity.

## 6.2. Vulnerabilities faced by fishers: So many fronts

*'The greatest vulnerability is my fate, decided on the very moment of my birth in a poor fishing household; it is God's game; who can forecast about it? All other social, natural and economic problems center around it. One thing I have known well that problems are my life-partners (jibon-sathi) and for the rest of my life, I will have to fight alone against all these.'* Suniti Jaladas, 55, Thakurtala.

*'The coast is like a desert now; too many fishers are chasing the fish; you know, there is a limit for everything; excesses are always bad; tortures on the sea have already crossed the limit; we, like the greedy farmer, kill the duck laying a golden egg everyday in order to grasp all the gold at a time. Just for simple meals, we all are so desperate now.'* Jatindra Jaladas, 70, Thakurtala.

*'We can't think of a life without flood and water in the haor, but when the water crosses the knee-level, then I become economically handicapped, a grim situation in all aspects which I have not been able to get rid of during the last ten years.'* Salma Khatun, 42, Volarkandi.

*'After marriage (exhausting my parental properties), I thought that I would find some comfort and happiness in my in-law's house.... Here poverty is also worse; my in-law became paralyzed last year; he is the only earner. His physical paralysis has actually paralyzed the whole family.'* Bashona Jaladas, 35, Thakurtala.

The above quotes tell us that the fishantry is continually exposed to pressures or vulnerabilities which are multi-faceted with differential and chain impacts on an individual's well-being and poverty level. This section examines the nature and impacts of multiple sets of vulnerabilities on fishers' livelihoods. Based on field observations, I argue that each crisis is multi-dimensional in cause and effect, and many of the stressors originate outside the living boundary of the villages, and are beyond the control of the fishers. It is also argued vulnerability is intricately related to one's socio-economic condition; the poorer the fishers are, the more likely they are exposed to multiple sets of vulnerabilities emanating from cross-scale layers. My analysis here concentrates on the vulnerabilities of the poor who comprises the absolute majority in the fishing villages. For this category of people, it becomes difficult to differentiate impacts of the known sets of crises from their recurrent struggles. This is especially true for the coastal village.

Vulnerabilities and coping strategies in a wider fishantry context are complex issues of thoughts and investigations that illustrate a landscape of immense divergence. Vulnerability (a widely used word in both disaster and poverty literature) is intricately linked to poverty, both as a causal factor and a direct product of poverty. Poverty and vulnerability have cross-scale, spatial and temporal dimensions; the former usually illustrates the present state of not having enough for a basic livelihood, while the latter forecasts the likeliness of sufferings or falling into poverty traps in future. It is often

viewed as simply identical to a decisive dimension or condition of poverty (Wisner 1993, Banerjee 2000, Banerjee et al. 2006, Morduch 1994, Devereux 2001). Vulnerability is a dynamic process and people move in and out of poverty due to vulnerability (Glewwe and Hall 1998, Moser 1996). It is difficult to assess and map all aspects of vulnerability as it is situated not only in human society, but also in complex social-ecological, political and global issues which cannot be arrested in frameworks specifically and straightforwardly. Here is a comment:

*'There are no common measures or indicators of vulnerability ... these difficulties arise because investigations of vulnerability are investigations into the workings of human societies, and human societies are complex—so complex and diverse that they easily break out of any attempts to confine them within neatly drawn frameworks, categories and definitions'* (Twigg, 1998, cited in Marzano 2002: 819).

Vulnerability implies the inability to cope with shock or misfortune. It can be defined as a high degree of exposure to risks, shocks and stresses and as proneness to food insecurity (Chambers 1989, Davies 1996). Vulnerability thus entails two distinct dimensions: the exposure to multifarious shocks and stresses emanating from internal and external sources, and individuals' internal state of defencelessness or lack of capability to take appropriate measures in the face of those risks. Berkes (2007) argues that in a way, resilience thinking as a conceptual tool to deal with uncertainty and future changes is the flip side of vulnerability; the concept puts emphasis on the ability of the linked social-ecological system to deal with the hazard and provides insights on what makes a system less vulnerable. Vulnerability is also viewed as a socially constructed set of conditions (Oliver-Smith 2001: 111), predisposed to the politics of its representation and marked by the prospective to redress or recreate extant power relations (Oliver-Smith 1996: 309-310, cited in Clay and Olson 2008: 148). The social construction of vulnerability within fishing communities is varied and can involve formal and informal institutions (Apostle et al. 1998), gendered differences (Thompson 1985, Davis and Wagner 2006), ethnicity and class (LiPuma and Meltzoff 1997, Meltzoff and Schull 1999, Allen and Gough 2006, Kitner 2006, Blount and Kitner 2007, Masozera et al. 2007, Aizenman 2007), and labor relations of productions (Kaplan 1999) (*ibid.*: 148).

Poor households are always prone to different vulnerabilities. Although some environmental vulnerability has level playing actions, broadly speaking the ownership of and access to productive assets and linkages with higher power-source institutions determine one's level of vulnerability and subsequent entry into or exit from the poverty level. Different authors have portrayed vulnerability from risk-centric and right-centric perspectives covering a multitude of issues like food insecurity, socio-political rights, justice, policy, market situation, gender and environment (Glewwe and Hall 1998, Sen 2002, Prichett et al. 2000). It is also important to examine how the poor people deal with uncertainty. In order to cope with changes characterized by surprises and unknowable risks in social-ecological systems, building a social memory of past events, nurturing socio-political diversity for enhanced options, and strengthening of local institutions with cross-scale linkages is critically important (Berkes 2007). Living with risk, uncertainty and insecurity is initiated through long-term meticulous observations that many long-enduring societies carry them out. 'Expecting the unexpected' is an oxymoron, but it asks for the tools and appropriate codes of conduct to fall back on when unexpected events happen (Hewitt 1983, Haque and Burton 2005).

Table 6.1 explains the gross causative factors and respondents' perceptions of gravity. As apparent from a series of FGDs, the decline in catches, family level health shock, lack of capital, natural calamities, piracy and insecurity<sup>1</sup>, unemployment and under-employment appear to be the important determinants of poverty. It is beyond the scope of this chapter to discuss all the issues in detail. One of the most important problems is food insecurity, which itself is a manifestation of impacts from other problems. For >45% and 60% families of Volarkandi and Thakurtala villages, income/day/family goes down to as low as US\$ 0.7-0.9 and 0.4-0.6 respectively during the lean period (meaning an allocation of about 10 cents per capital per day). Given the fact that almost everything is to be purchased for the meals of family with this amount of

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<sup>1</sup> Piracy and insecurity situations in coastal areas have become aggravated in the recent years. One report shows that between 1999 and 2007, the fishers of Sitakunda upazilla under southeast Chittagong lost 12000 gill nets, 4000 ESBNs (Estuarine Set Bag Nets), 80 engine boats and 38 wooden boats. Police reluctantly mentions they have nothing to do in 'water-related offences'; the illegal collection of money from poor fishers by groups of miscreants is widely known (source: The daily Prothom Alo, national daily, Feb. 04, 2008).

money, the families face dire features of poverty on a daily basis. This issue is discussed in detail in section 6.2.3 of this chapter.

**Table 6.1: Problems faced by the fishers (based on multiple answers, number of respondents =30 in coastal village and 22 in floodplain village)**

Crisis	Response in %		Remarks
	C	F	
Daily struggle for meals for self-and-family	73	45	
Serious decline in fish catch	63	64	Last 5-7 years
Health shock: sickness, death, disappear and accident	57	32	Year round
Tidal upsurge/flash flood/disastrous flood/drought	50	45	Monsoon period
Piracy and insecurity in the sea; lack of safety measures, navigational signals and timely weather forecast system	47	-	Almost year round
Dowry	39	27	During marriage of girls
Socio-religious conflict/ exclusion and eviction	39	19	Usual for Hindu fishers
Price hike of basic amenities	57	45	Intolerable in last 4-5 yr
Conflict over land and water area with leaseholder	-	32	Dry period
Degraded ecosystem & forest, increased sedimentation, salinity intrusion, pollution, drainage congestion	37	19	Year round
Destruction of young fish by destructive gears	47	45	Almost year round
Lack of capital and perpetual dependence on moneylenders	56	13	Specially, during non-fishing period
Lack of facilities-ice, storage facilities, infrastructure	17	9	Dry months specially
Lack of education and scope of alternative employment	37	19	Year round
Poor basic amenities & inputs (e.g. housing, health care, potable water, latrine, electricity, fuel wood, cemetery)	37	19	Year round
Others (lack of govt. support, humiliation by police, bribe)	13	9	Do

Key: C-Coastal, F- Floodplain Source: FGD in the Thakurtala and Volarkandi village, June 2005.

It is apparent from Table 6.1 that vulnerabilities are also cross-scale in nature.

- The first types of vulnerabilities originate from the very ecotype where the fishers work, *i.e.*, the natural and biological attributes like flood, cyclone, storm, water quality, fish disease/kill, reproductive failure, spatial and temporal variation of resources. Some ecosystems produce more resources than others; fishing in some ecosystems requires more capital than the others; some ecosystems are more threatening to life than others and the frequency of calamities might increase over time.
- The second type with phenomenal ripple effects originates from the fishanry within or outside village by similar groups of fishers. To mention a few: 'Jatka' (immature *Hilsa* spp.) fishing in Chandpur, Barishal and Patuakhali district areas affects the CPUE (catch per unit effort) of Cox's Bazar-based fishers; shrimp fry gathering from wild along the coastal belt for shrimp monoculture affects the

catch and value of marine set bag nets (MSBN); construction of bamboo dykes obstructs fish migration and hence spawning failure in the *haor*; operation of *berjal* (destructive thick meshed encircling gear) affects the gill netters of *haor*, and many other cases like these (further details in section 6.2.1. of this chapter).

- The third type originates from cross-scale institutional failures and policy related decisions. Some of these are price hike, lack of basic amenities, lack of alternative employment, social exclusion etc. Leasing to a powerful leaseholder for high bidding money will adversely affect the access rights of thousands of fishers, and also the resource base of the waterbody.
- The fourth type originates from geopolitical and trans-boundary sources. To mention a few: a dyke in the *Farakka* region of India affects the *Hilsa* population of the Padma River; desperate fishing using monofilament 'current nets' in the Myanmar territory affects the same stock in the Cox's Bazar/Teknaf region; the unregulated dismantling of the abandoned ships of the western world in the south-east coastal region of Chittagong affects the water quality and fish abundance in the region; the gradual increase in the industrial trawler fleets affects the small-scale fishers' catch; the clear-cutting of mangroves for shrimp culture on the coast impacts the catch level of the small-scale fishers; the war of 1971 forced many Hindu fishers to migrate to India leaving all properties; the political turbulence affect the delivery of fish to markets resulting in spoilage and lower prices, and so on.

It is the poor section and female-headed households who are usually affected often with more severity than the male-headed households. For example, a heavy rain in the salt-production area, or a low development budget for rural development, or a disease out-break in the shrimp farms obviously reduces the chance of women-labor engagement during the most critical survival period of monsoons on the coast. A poor catch by fishermen in the sea means less chance for fisherwomen vending wet-fish locally or working as day-laborer in fish-drying yards. A decline in catch not only adversely impacts the fisher's family, but also dry fish producers, ice sellers and crashers, fish choppers, poor gatherers of trash fish in the landing sites, tea vendors in the landing sites, basket weavers, fish carriers, rickshaw (tricycle) van pullers, transport business and

laborers, ancillary traders, retailers and many more dependent groups. In the following section, I will discuss a few stressors in detail.

#### **6.2.1. Decline in natural resource base**

*'Koli Kal' (worst epoch/grim future), fish keeps declining.' Jamini perceives.*

*'Government estimate shows that fish catch is increasing.' I added.*

*'We catch fish, we know; the Fishery Officers don't go to the sea to catch fish; they show higher estimate to save their jobs.' he added.*

*'Could you please tell me in your own way about how rapid is the decline?' I asked.*

*'Let me tell you my 'mathematics'. I started going to sea along with my grandfather when I was 12. Fifty years ago, my grandfather used to count Hilsa fish in 'Kowns'; 20 years ago in my father's time, I saw him counting Hilsa in 'Pons'. Those days have gone by. Now we count Hilsa in 'Halis' or one by one. See how wide the differences in just fifty years! The change in the style of 'calculation' points to the corresponding change in the financial positions of the fishers-from affluence to paucity.' (Numeric: 1 Kown= 16 Pon= 1280 pieces, 1 Pon= 80 pieces, 1 Hali=4 pieces) (excerpt of interview with Jamini Jaladas, 68, Thakurtala).*

The coast and the sea, once perceived by fishers as a potent symbol of natural limitlessness for fish transformed to overharvested 'desert area' in the last few decades; similar situation prevails in the floodplain capture fisheries also. For the fishers, the issue of ecosystem health and the availability of fisheries resources is not merely a concern of biodiversity; rather it is more importantly an issue of livelihood security. The relationship is straightforward from fishers' perspectives. Loss of harvestable fish means poor income from fishing leading to desperate fishing and prolonged fishing time. This section will concentrate on a few pertinent issues which impact heavily the coastal fishers and fisheries, and then issues of floodplain resource base will be discussed.

Government statistics reveal there is an increasing trend in the production of fish, but it hardly leaves us with the impression of 'Catch per Unit Effort' (CPUE), which the fishers usually refer to in their own vocabularies. There is a 'chorus of concern' throughout the world on the decline of fisheries resources, and the situation has already been aggravated in cases of coastal fisheries in Asia (Stobutzki et al. 2006, FAO 2002, Pauly et al. 2002). Enormous dependence of fishers<sup>2</sup> on the resource base has caused both overfishing and perpetual poverty. The absolute loss of biological yield is around 12% worldwide, but the loss of the economic benefits is certainly higher (FAO 2002). Fishing

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<sup>2</sup> FAO (2002) estimated that of the 27 million fishers worldwide, 22 million live in Asia. If other associated industries are considered, then capture fisheries support 88 million people in Asia.

for immature fish and shell-fish is quite rampant in the coastal areas of Bangladesh. The ratio of the undersized fish to the total catches is usually very high in a multi-species multi-gear fishery, and the large-scale mortality of larvae and juveniles of fish and shell-fish is detrimental for the fishery in the long run. Najmudeen and Sathiadhas (2008:331), from their study in the Kerala coast, India, concluded that the economic loss incurred due to growth overfishing outweighed the annual average revenue generated by various craft-gear combinations.

To meet the increasing demand for fisheries resources in a globalized world, Berkes et al. (2006) cautioned that the industrial fishing fleets-‘roving bandits’ (terminology used by economist Olson 2000, *cited in* Berkes et al. 2006) can seriously disrupt the marine food web; thus posing the greatest ecological risks for the marine ecosystems. They warned that existing marine protected areas and/or no-take areas are often too small to counterbalance the damages within the broader seascape, and monitoring and enforcement in the far-off areas are often inadequate (*ibid*: 1558). During the field study, none of the inland and coastal fishers agreed with the yearly on-growth of fish harvest in the country; rather they unanimously revealed serious concerns about the decline in fisheries resources (Figures 6.1, 6.2a, 6.2b). The perceived catch level is shown in Figure 6.2.c. The reduction in fish supply followed by poor peoples’ capacity to purchase is manifested from the fact that average fish consumption in the country has declined by 12% since 1995, and the fish consumption by the poorest section has declined by 38% (BBS 2000).

Through a series of focus group discussions with the E/MSBN (estuarine/marine set bag net) and gill net fishers, it was revealed that shrimp fry collection from the coast, intrusion of the trawlers, ‘*Jatka*’ (*Hilsa* juvenile) fishing in the coastal and riverine areas, pollution, clear-cutting of mangroves for shrimp culture, and massive pollution from industrial, municipal, agricultural, shrimp hatchery, and ship dismantling yards are some of the serious causative factors ruining the catch level and income of subsistence fishers.

Let me examine the fry fishing issue in the coastal areas (Figure 6.3) where a trend of Malthusian overfishing<sup>3</sup> is evident. For shrimp culture in the coastal 'gher' (pond), thousands of poor fry catchers<sup>4</sup> are engaged in fry fishing, and in doing that they destroy millions of other commercially important fish larvae (ichthyoplankton) and zooplankton using low-meshed mosquito nets (mesh 1.05mm). For catching a tiger shrimp fry (*Penaeus monodon*), larvae of 26 other types of shrimp, 29 fin-fish and 70 other zooplankton are simultaneously destroyed (Deb 1998a). The Malthusian trend is evident from the fact that the number of fry catchers increased from 65,000 (Deb1998a, see Annex 5D, plate 5D6) to around 1,30,000 in 2009 along the south-east coastal belt (source: Cluster survey result of local NGO-'Green Cox's Bazar', referred by the Daily Jai Jai Din, dated 4 Sept. 2009, [www.jaijaidin.com](http://www.jaijaidin.com)). It is estimated that around 518,130 fry catchers are engaged along the coastal belt of Bangladesh (source: Fisheries Sector Review and Future Development Theme Study: Economic Performance, June 2003, [www.bdix.net/sdnbd\\_org/world\\_env\\_day/2004](http://www.bdix.net/sdnbd_org/world_env_day/2004)), catching annually around 3000 million shrimp fry. Using the proportion of targeted shrimp larvae versus other zooplankton (Deb1998a), it is estimated that 297 billion other commercially important shrimp and fin-fish fry and zooplankton are simultaneously destroyed in the coastal areas of Bangladesh. Worst of its type, fry fishing has recently become a geo-political problem between Bangladesh and Myanmar<sup>5</sup>.

<sup>3</sup> Malthusian overfishing occurs when poor fishers faced with declining catches and lacking any other alternative initiate wholesale resource destruction in their effort to maintain their income (Pauly 1994).

<sup>4</sup> The situation has been aggravated recently; thousands of 'Rohingya' intruders from Myanmar have joined the local fry catchers and are being patronized by a group of moneylenders and political activists.

<sup>5</sup> In 1978, around 200,000 'Rohingya Muslims' fled the Burmese (now known as Myanmar) army's operation 'Nagamin' (Dragon King). About 10,000 refugees remain in Bangladesh, another 10,000 died in the refugee camps, and 180,000 were forcibly repatriated. In 1991- 1992, there was another influx of approximately 250,000 Rohingya Muslims due to forced labor, land confiscation, religious intolerance, rape, and other forms of persecution by the Myanmar military regime. In February 1992, UNHCR and international humanitarian organisations establish a broad relief operation in 19 to 20 camps along the Teknaf - Cox's Bazar Road (Unpublished Field Report, Médecins Sans Frontières-Holland, March 2002).

As of now, officially around 25,000 (unofficially around 60,000) remaining refugees have come to be known collectively as 'the residual caseload,' left over due to their reluctance to return to what caused them to flee in the first place, and due to a protracted clearance process by the Myanmar authorities. The refugees have spread throughout the southeast coast. Thousands of these refugees are engaged in fry fishing for cash earning at the patronization of the local Bangladeshi influential persons, who provide them political and administrative supports, and in lieu compel the refugees to sell wild shrimp fry at a cheaper rate. In the sandy coast of Cox's Bazar, around 4 km from the coastal study village, around 500 Rohingya families live on fry catching. The local estuarine and marine set bag net fishers expressed their serious

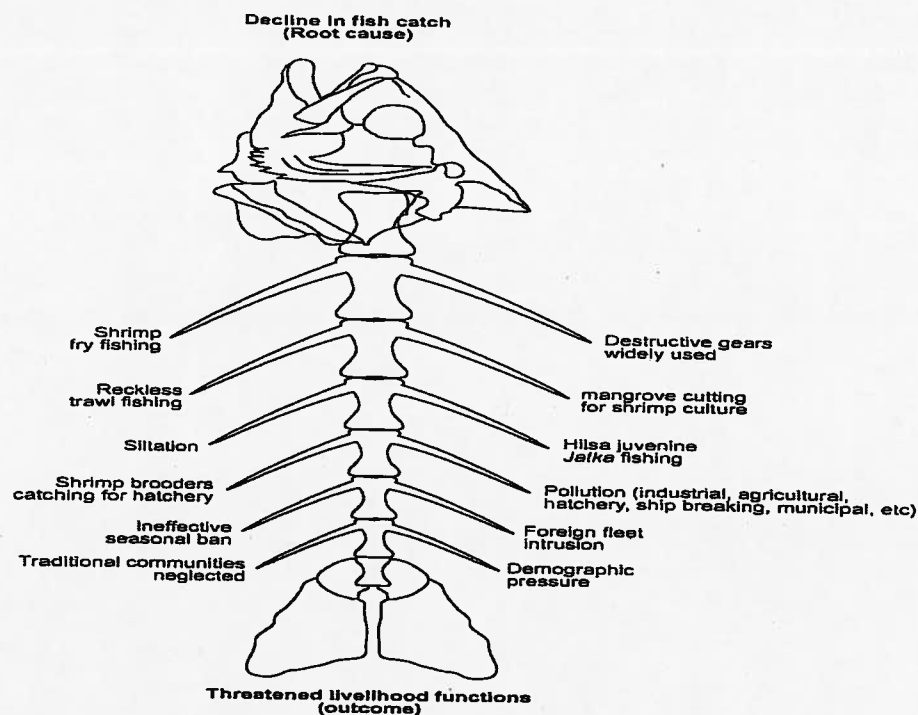


Figure 6.1. Fish skeleton showing fisher's perception on root causes for fish decline (based on FGD with key informants, 16-2-2005).

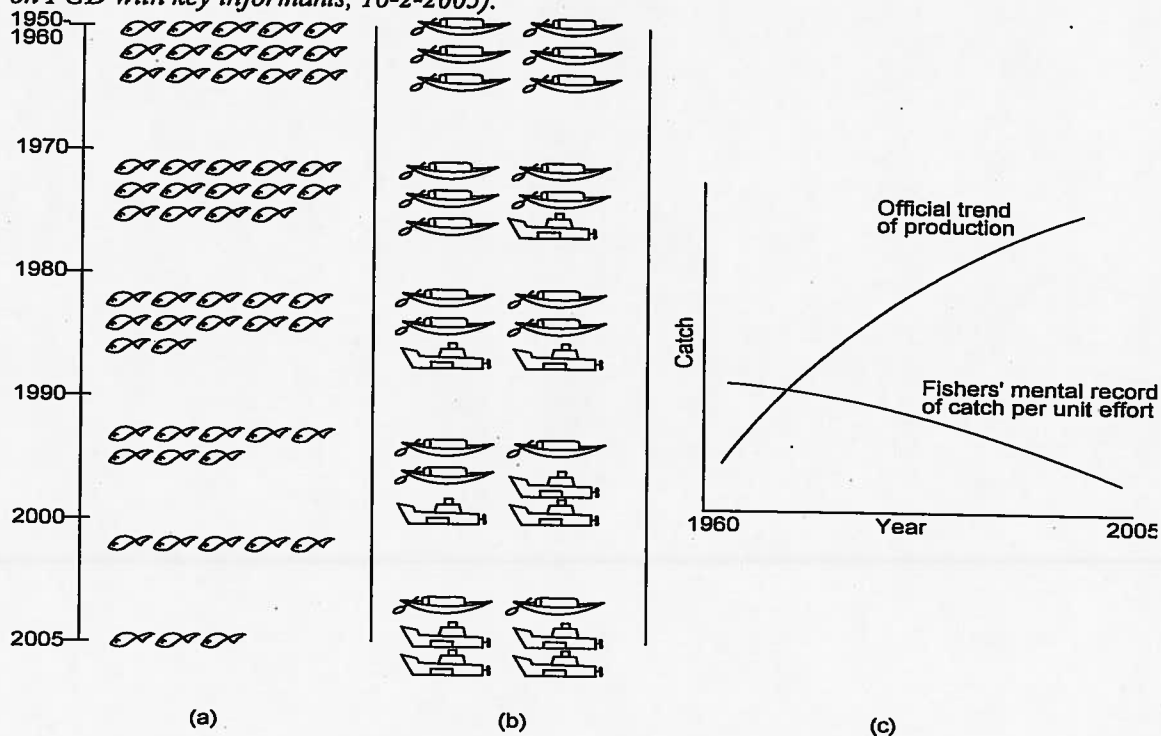
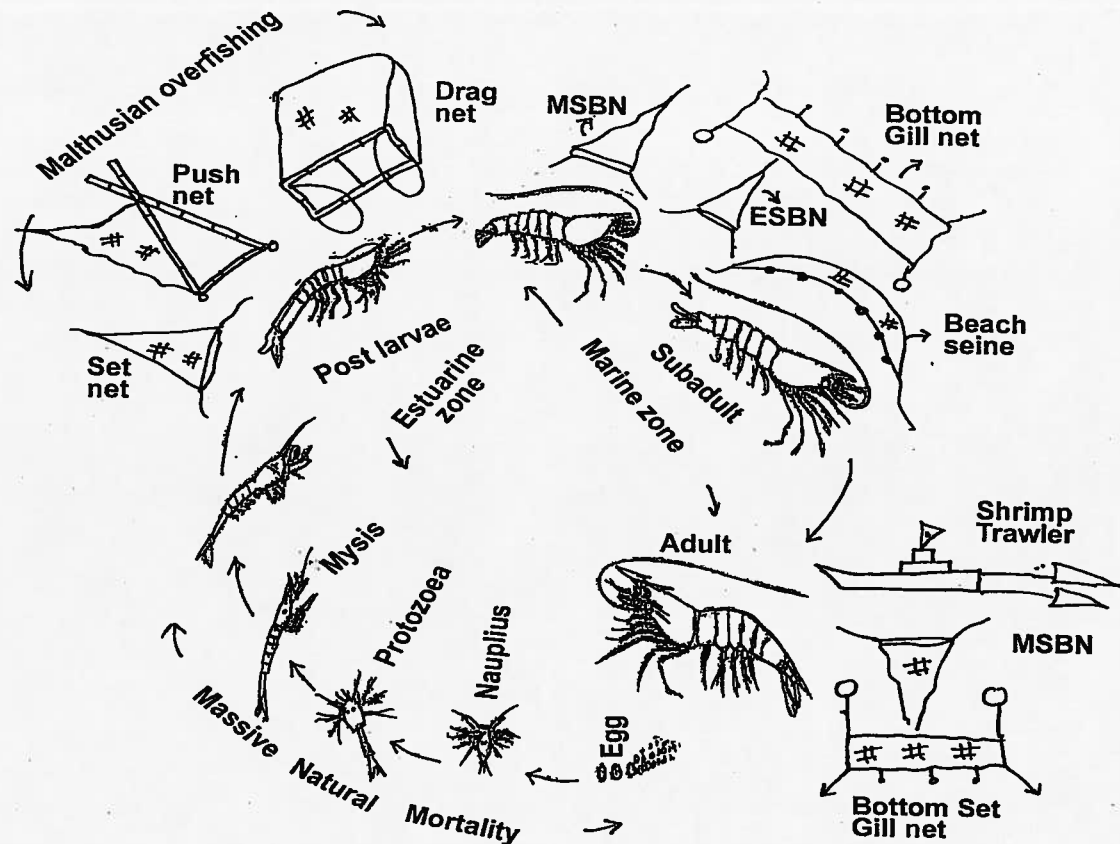


Figure 6.2.a. showing decline in CPUE, b. increase in mechanization and c. fisher's different view with official statistics. Figure C is an interpretation of government statistics and fisher's perception on the resource availability (FGD with key informants, Cox's Bazar, March 2005).

concern over the entry of these competing refugees. This issue of illegal fishing by refugees was found to escalate tension and conflict in the area.



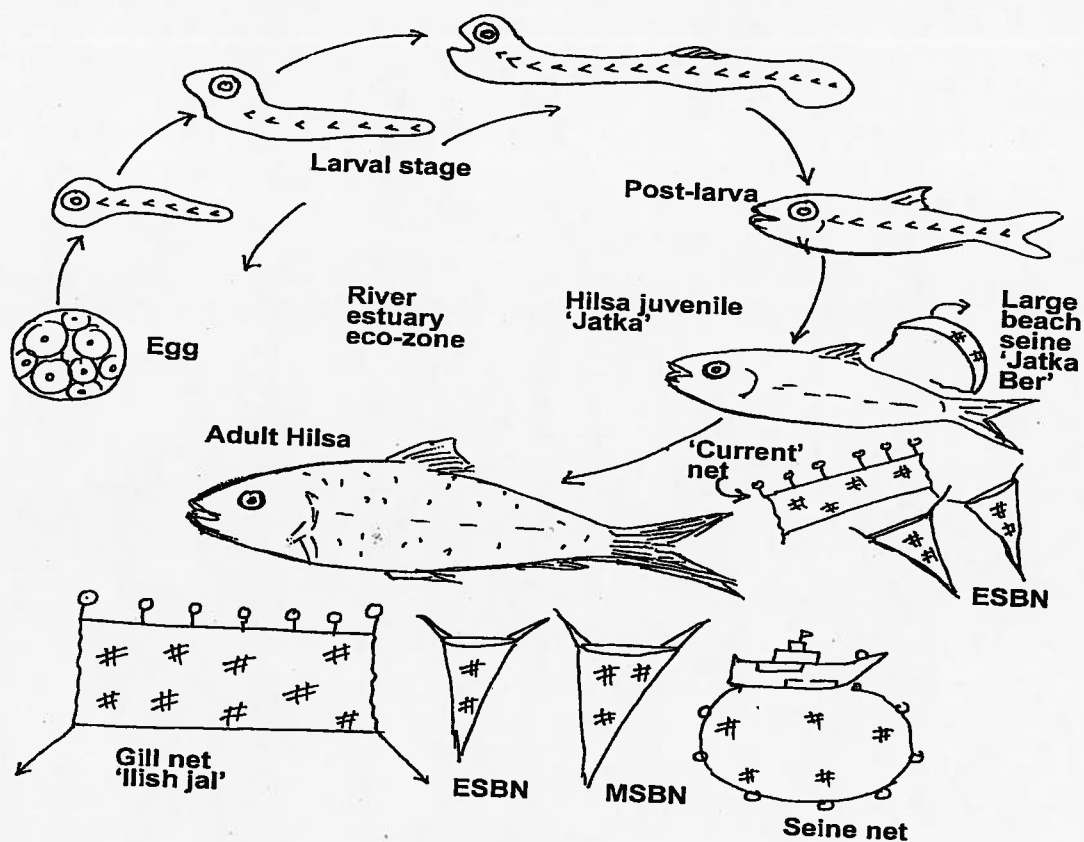
**Figure 6.3: Exploitation of shrimp at various life stages** (based on a synergy of scientific knowledge and TEK derived in a FGD with key informants, Mohekhali, 23-3-2005).

The proliferating impact of such massive loss on the food chain and biodiversity for providing input to shrimp culture pond is obviously immense, and awaits detailed study. Shrimp fry fishing was banned in September 2000, but in the face of protests from shrimp farmers, the ban was relaxed by the government in 2007. It may not be possible for the government to stop fry fishing without affecting the market chain of fry traders. It is predicted that the exploitation ration (E) in the case of the ESNB fishery (0.85) and trawl fishery (0.71) far exceeded the limit (Hoq 2007). Brooder shrimps are also massively harvested by shrimp trawlers for hatcheries. There is a dilemma here. Fry catchers argue 'the rich trawler and hatchery owners should stop fishing 'brooder shrimps' first; one mother shrimp produces millions of fry in the wild and that they catch shrimp fry for their livelihoods; the riches don't have to worry for meals like us' (FGD with fry fishers, Charpara slum, Cox's Bazar sea beach, February 2006). The artisanal fishers keep complaining that the catch of adult shrimps in the ESNB and MSBN catches

declined sharply due to fry fishing for shrimp grow-out ponds, and also massive exploitation of brooder shrimp for hatchery operation.

Fishing *Hilsa* juveniles ('*Jatka*') has been an acute problem in the *Hilsa* fishery that comprises around 25-30% of all marine catches. Because of this desperate fishing of immature *Hilsa* (Figure 6.4, annex 5D, plate 4D3) and some changes in the morphology and hydrology of major rivers, the catch tends to decline. The total landing of *Hilsa* catch has reduced by 56% compared to the last 10 years (Hoq 2007). It is known that around 19258.32 MT of immature *Hilsa* are harvested by fishers annually (FFP 2004). Assuming a further natural mortality of 60% and an average weight of *Hilsa* juvenile of 30gm (at 70-120mm length cohort) and an adult of 700 gm, it is estimated that Bangladesh is annually deprived of around 1,77,000 MT of mature *Hilsa* worth US\$ 2724 million. However, some measures like the banning of *Jatka* fishing and closure in selected spawning areas have shown some positive results on the catch in the past 3 years. If immature *Hilsa* are not recklessly harvested in the backward migration from riverine zones, the CPUE and income for coastal fishers would have been presumably higher. The situation is that in a multi-gear and multi-species fishery, growth overfishing (juveniles harvested by the fishery before the cohort had opportunity to attain maximum biomass level) renders unavoidable if some measures like seasonal closure and compliance with mesh regulations are not strictly observed.

The untreated pollution loads from all the municipalities, broad-spectrum pesticides used in the agricultural sector, ship breaking yards, tanneries, pharmaceuticals and other industries ultimately find room in the coastal areas and their synergistic impacts on marine flora and fauna are not known. Coastal artisanal fishers complain that industrial trawlers frequently enter the designated 'no-fishing zones' (<40m depth zone as per Marine Fisheries Ordinance 1983) for a 'bumper catch'. The impact of trawling on the ecosystem of the highly productive shallow zone and the synergistic impacts on the pelagic, demersal and benthic/sessile stocks ask for further studies.



**Figure 6.4: Exploitation of *Hilsa* spp. at different stages of life cycle**

*Legend: ESNB: Estuarine set bag net, MSBN: Marine set bag net*

*(based on a combination of scientific knowledge and TEK derived through FGD with key informants on 27-3-2005)*

An analysis of the trend in mechanization shows that the number of mechanized fishing boats increased by >100% between the 1980s and 1990s, and the industrial trawler increased by >1000% in the last two decades (Deb1998b) at the patronization of different international agencies<sup>6</sup>. Although both the mechanized and non-mechanized modes of production coexist, the mechanized sector keeps growing at the cost of the non-mechanized traditional sector. I argue that the escalation in mechanization and industrialization is a growing concern for the very existence of the age-old non-mechanized fisheries sector. Endresen (1985: 100), from her study on impact of technological change in two fishing villages of southern Sri Lanka concluded that low level income of fishers is not necessarily related to the dependence on primitive

<sup>6</sup> However, this is not to say that technical improvements are unwanted. In fact, there is room to make the fishing crafts more fuel efficient and seaworthy with more safety, storage and processing facilities (ferrocement boat would be an ideal candidate).

technologies, rather the introduction of sophisticated technology implies both the great chance for prosperity and the highest risks of poverty. She commented:

*'mechanization of the fishing fleets lead to technical retardation diminishing the traditional fishermen's opportunities of improved living conditions, and the technological heterogeneity implies the possibility of technological polarization which may reinforce the development of social inequality...increased poverty will increase the fishermen's economic dependence on the fish traders' (ibid: 103).*

Alexander (1975, cited in Endresen 1985: 4) mentioned that modernization has led to a dramatic recession in traditional fisheries; he also claimed that modernization took place in a 'cultural vacuum' and stagnation of economy. In Indonesia, Niehof et al. (2005) mentioned the adoption of the inboard engine allowed *majāng* fishermen to bring their own catches ashore daily, thus putting an end to their dependence upon transporters and middlemen. In the mid-1980s, the introduction and wide adoption of the slender vessel, the *klotok*, helped to absorb redundant manpower initially but soon replaced some traditional forms of fishery. Trawling appeared so harmful that the government eventually banned trawlers in the late eighties in Indonesia (Bailey 1997) for essentially reallocating resources in favor of small-scale fishers. These observations apply to the artisanal fishery of Bangladesh also. Interestingly, a stakeholders' opinion survey (organized by the ECFC Project, 12 September 2006, Cox's Bazar) on the pros and cons of increased mechanization reveals that most of the fishers (87% caste-based ESNB fishers, 100% fishing women, 100% fry fishers, 73% MSBN fishers, 67% NGO representatives, 56% academicians) are vehemently against the trend of mechanization, while the powerful section of the society (100% boat owners, 82% law enforcing agency members, 90% politicians and 100% government officials including DoF personnel) showed positive interest behind the present trend of mechanization in the fishery. Eventually the issue clearly rendered to a 'power divide'. Poor fishers, using non-mechanized boats, voiced that both mechanized boats and industrial trawlers frequently compete with them illegally in the shallow zone for exploiting the same resources, especially penaeid shrimps from the near-shore coastal waters.

How is the health of the aquatic resources in the Hakaluki *haor*? Villagers are worried that the overall resource base<sup>7</sup>, in particular the fishery and swamp forests, are eroding fast because of anthropogenic pressure and uncontrolled use of destructive nets. The IUCN (International Union for the Conservation of Nature) 'Red Book' for Bangladesh suggests that almost 30% of all inland fish species, for which data is available, are prone to extinction; 54 inland and estuarine fish species out of 266 present in Bangladesh are endangered (IUCN 2000). It is estimated that 50% or more of the perennial wetlands of Bangladesh have been drained, encroached upon, filled or otherwise lost in the past 30-40 years, negatively impacting the poor, environmental services and biodiversity (World Bank 2005). I saw floodplain fishers cutting saplings of swamp forests recklessly for use as fuel for cooking.

I tried to know the fishers' view on the availability of fish in the Hakaluki health. Unlike a long-term methodical study, I adopted a simple technique to make out what the fishers consider about the fish population in the wetlands. To keep the list simple, I considered only those species beyond the 'red list' of IUCN Bangladesh. The list was developed and validated through a series of small group discussions. Only consensus views of purposively selected experienced fishers (having at least 15 years of active fishing experience) are considered and conflicting views are nullified. One popular method of calculation has been used. Instead of using percentage values, fishers use the 'ana'<sup>8</sup> system which they feel more comfortable with. The calculation derived from 'ana' has been transformed to the IUCN Redbook classification. The following formula was devised and agreed by the fishers (1 *ana* = critically endangered to nearly extinct, 2-3 *ana*= endangered, 4 *ana*= vulnerable, 8 *ana*= less abundant or lower risk, 10 *ana*= available or not threatened). Table 6.2 provides a new list of threatened fish.

<sup>7</sup> Though it is beyond the scope of the present study, I observed that wetland inhabitants, specially children and women, collect 'pitmond coal' in the dry season from *Chanda beel*, *Baghia beel*, *Chatal beel* and some other *beels* of Moulavibazar and Sunamganj districts. They dry the 'coal mud' under the sun and use it for cooking. Because of excessive sulfur content in the coal, a huge amount of toxic sulfur-dioxide gas is produced during cooking which is bad especially for the women. Some women chew the pitmond coal for its supply of trace elements during pregnancy.

<sup>8</sup> In the Bengali monetary system 16 ana equals to one Taka or 100 paisa. Each 'ana' is like 1/16<sup>th</sup> of a Taka or roughly 6 paisa. Hence 1, 4 and 8 ana equals to 6%, 25% and 50% respectively, 1 paisa means 1/100 of what it was before.

**Table 6.2: Fish identified as threatened by fishers (beyond IUCN red list)**

Local name	Scientific name	Fishers view on status in haor
Cheng	<i>Channa orientalis</i>	2 ana (Critical)
Telo taki	<i>C. gachua</i>	2 ana (Critical)
Napit mach	<i>Badis badis</i>	4 ana (Vulnerable)
Dari mach	<i>Nemacheilus zonatus</i>	2 ana (Critical)
Koirka	<i>N. corica</i>	4 ana (Vulnerable)
Ghagot	<i>Gagata gagata</i>	4 ana (Vulnerable)
Bagha ayre	<i>Bagarius bagarius</i>	2 ana (Critical)
Deshi pungus	<i>Pangasius pangasius</i>	1 ana (Critically endangered)
Vagna bata	<i>Labeo boggut</i>	2 ana (Critical)
Kaski bata	<i>Mugil cascasis</i>	2 ana (Critical)
Chuinna baila	<i>Brachygobius nusus</i>	2 ana (Critical)
Dogira baila	<i>Apocryptes bato</i>	2 ana (Critical)
Banspata	<i>Danio devario</i>	1 ana (Critically endangered)
Lal khoilsha	<i>Colisa lalius</i>	2 ana (Critical)
Gutum	<i>Lepidocephalus guntia</i>	2 ana (Critical)
Piyali mach	<i>Aspidoparia morar</i>	2 ana (Critical)
Boiragi mach	<i>Salmostoma argentea</i>	2 ana (Critical)
Taku chanda	<i>Leiognathus equulus</i>	2 ana (Critical)
Mota puiah	<i>Lepidocephalus annandalei</i>	2 ana (Critical)
Darkina	<i>Rasbora daniconius</i>	2 ana (Critical)
Along/ alang	<i>Rasbora elanga</i>	1 ana (Critically endangered)
Ekthuita	<i>Hemiramphas gaimardi</i>	2 ana (Critical)
Shal baim	<i>Mastacembalus armatus</i>	2 ana (Critical)
Kuiccha	<i>Monopterusuchia</i>	2 ana (Critical)
Vangol bata	<i>Labeo boga</i>	4 ana (Vulnerable)
Lassu	<i>Cirrhinus reba</i>	2 ana (Critical)
Kotkoti/Kotkoitta	<i>Chaca chaca</i>	2 ana (Critical)
Joia/koksha	<i>Barilius spp.</i>	2 ana (Critical)
Kanpona	<i>Oryzius melastigma</i>	2 ana (Critical)

Source: FGD series on 10-1-2006, 16-2-2006, 25-3-2006 with Volarkandi fishers.

Some of the causative factors behind such a decline in fisheries resources are: increased sedimentation from the upstream area resulting in a less water retention period in the haor and less spawning success of some species; insecticide flow from the surrounding tea garden<sup>9</sup>; uncontrolled use of some destructive gears (like 'kapri jal', 'ber jal'); drying of seasonal beels by leaseholders, thus killing all animals therein; and erection of dykes and other barriers on the spawning route of fish (excerpts from PRA, dated 27 May 2006). They mention their dependence shifted from 'earlier golden days of

<sup>9</sup> Floodplain fishers mentioned that insecticide-rich water-flow from the surrounding tea gardens is a major concern. I estimated that annually around 15,310 -30,620L of insecticide is being used in the 12,247ha area of tea garden and assuming that at least 25% of these poisons reach through rainfall in residual form, an estimated amount of 3827-7655L/year eventually find place in the downstream areas of Hakaluki haor. The impact of residual insecticides from up-land tea-gardens on the fish and other aquatic fauna deserves detailed study.

major carp fishery' to less valued small minor carps, *beel* resident species, small predators, detritus feeders and small plankton feeders (excerpt of small group discussion with fishermen, Pabijuri village, 20 April 2005). Fishers reported the existence of highly predatory exotic fish like African catfish (*Clarias gariepinus*) and 'Piranha'<sup>10</sup> in certain beels (to mention a few, *Koiarkona beel*, *Chatla beel*). Exotic species like Tilapia, Grass carp, Silver carp, Common carp, Bighead carp, Mirror carp and Thaiputi are also reported by the *haor* fishers. These fish are known to escape from local fish ponds; the impacts of these exotic species on the indigenous species deserve thorough investigation.

### 6.2.2. Natural calamities

*'Why should I go for erecting a new house knowing that there is a cyclone moving on my head...Fire leaves some charcoals and ashes, cyclone wipes out everything. Don't remind me of the impacts of the cyclones, it robbed everything from my family.'* Vojon Jaladas, 65, Thakurtala, Moheskhali.

*'We keep struggling; we try to be back to normalcy after years of struggles and sufferings; as we stand on our own feet, cyclones devastate everything again; cyclone doesn't reach the rich in the town; it is a bane for those who are already poor.'* Monohori Jaladas, 58, Thakurtala.

*'It is (Flood) from Allah; He decides everything; we suffer because of our sin.'* Saleha Begum, 46, Volarkandi, Hakaluki haor.

Calamities may stem from different (natural, man-made) sources. While natural calamities apparently have an even out effect on all, fishers with low endowments suffer most. Though their material loss is low compared to the rich section, they often fail to regain the endowments. This section will be limited to the issues of cyclones and floods only. Given her deltaic geographical position along the Bay of Bengal, natural calamities like floods and cyclone are quite recurring in Bangladesh with differential impacts (Haque 1994, 1995; Paul 2009), and very often these act as strong 'drivers of descends' of poverty layer. Bangladesh (along with China, India and Indonesia) is tagged in the "extreme" category in terms of the average number of citizens at risk of tropical cyclones, earthquakes, floods and landslides, according to a new 'Mortality Risk Index' put

<sup>10</sup> This fish was first known to be imported by aquarium fish businessmen from Thailand without any quarantine; later some hatchery owners of the Comilla and Feni districts started captive breeding and growing; now it is found in major fish markets and sold as 'Thai pomfrets'. Annual floods have taken the species to the wide floodplain areas. The concerned government officials took no precautionary effort for environmental screening of this much known Amazonian predator, so far. The nature and food habit of this species in the wild is not known. I was told about the existence of the species in the wide floodplain areas from different waterbodies and this issue deserves serious attention of the fisheries officials. The damaging nature of the African predatory catfish is also a big concern for the wetland fishers. The culture of the fish is banned by the government so far, but I saw the catfish being openly sold alive in major fish market.

forward by the UN International Strategy for Disaster Reduction (source: [http://www.preventionweb.net/files/9929\\_MRIA3.pdf](http://www.preventionweb.net/files/9929_MRIA3.pdf), launched on 16 June 2009). Among all the natural calamities, these cyclones are the most destructive of all atmospheric disturbances leaving worst scenario of fatalities and economic loss in recent histories (Haque 1995). Around 500 cyclones originated in the Bay of Bengal in the last century of which 17% hit the coast of Bangladesh, meaning a severe landfall once in every three years, 53% of which claimed more than 5000 lives on an average (GOB 2008, *cited in* Paul 2009). Around 900,000 coastal people died in the last 35 years; the southeastern coast received around 27% of the total cyclone landfall. Meteorological and geographical conditions<sup>11</sup> ideal for the formation of tropical cyclones prevail in the Bay of Bengal along the coast line of Bangladesh.

The country with a large marginalized population has communities like fishers that are more vulnerable in all consideration. Poor households' bundles of capitals are usually disrupted or lost, while the rich may even gain from the distress sale by the poor of the same locality. Coastal artisanal fishers, mostly inhabiting near the coastline, are usually the first hit in the event of cyclones. Pomeroy et al. (2006) mentioned the impact of the December- 2004 Asian tsunami on the coastal poor fishing communities was high compared to that on other groups of people in India, Indonesia, Sri Lanka and Thailand. Many families fail to recover from the shock over a couple of decades. Bangladesh would face an even worse level of human displacement and settlement problem in near future as a consequence of sea level rise. However, the countrymen have enriched their experience and coping strategies in the face of these environmental shock<sup>12</sup>.

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<sup>11</sup> Some of these are: low-pressure system that commonly originates between five and 15 degrees latitude in the tropics during specific weather and temperature conditions (Molnar 2005); water temperature that remains at least 26°C throughout the year (Hastenrath and Lamb 1979, Ali 1996); a water depth of at least 60 meters is needed in an area for the development of a cyclone (Anthes 1982, Emanuel 1988) (Compiled from Paul 2009). From the Geo-morphological point of view, the overall concave shape of the Bay of Bengal and her large shallow continental shelf, the semi-diurnal tidal amplitude, and the intricate networks of connecting rivers add to the formation, landfall and severity of impact of the cyclones.

<sup>12</sup> This is manifested from the fact that the death toll caused by cyclones reduced drastically in recent years. For a comparison, the incidence of two major cyclones (category IV cyclones on the Saffir-Simpson Hurricane Scale) of April 29, 1991 (Cyclone Gorkey) and November 15, 2007 (Cyclone Sidr) can be considered. With similar kind of wind speed (240km/h), duration (+12 hours), storm surge height (around 6m) and duration (around 3 hours), the human death toll in 2007 was 3406 only, compared to 140,000 in 1991. The landfall time and area, higher rate of evacuation compliance, government measures for cyclone

Quantification of all the losses at the family or community level is difficult. In the coastal fishing villages, a moderate to strong cyclone means the loss of houses, loss or damage of assets like the fishing gears/boats, as well as loss of economic safety nets and human lives. I brought up a detailed case study (section 6.3 this chapter) of a destitute fishing woman whose husband was washed away by the sea. Fishers become scared, at least for the time-being, after seeing the carcasses and horrors of cyclones. Again, they have to do stressful jobs for erecting their houses and returning to normalcy.

*'My husband did not want to leave homesteads for saving cows and domestic properties; he was confident that he wouldn't die; local thugs snatched all my money and gold ornaments on my way to the cyclone shelter in the midst of darkness. When I returned the following day with my son and daughter, I found nothing was left on the homestead. My husband's dead body was found two kilometers away. We starved for three days; I had nothing to spare and spend. Then I borrowed to erect a shelter; I tried a variety of jobs like earth cutting, working as a daily labor in the fish drying yard and finally as a maid servant for saving my son and daughter. One shock of wave turned my life to hell.'* says an early widow Bidhurani Jaladas (35), Thakurtala.

Throughout the coast, there are thousands of such victims for whom the memory of the cyclone on April 29, 1991 is still a nightmare. I mentioned in Chapter Five that sea-fishing is a risky profession (see Annex 5, plate 5D5) and the number of early widows is higher in the coastal fishing villages compared to other nearby rural villages. A rapid appraisal on the impact of April 1991 cyclone with the Thakurtala villagers (May 02, 2006) revealed that almost all the fishing houses were washed away and around 90% of the fishers lost 50-80% of their domestic properties whatever they had. *'I leave my homestead prior to cyclone; I become an environmental refugee in my own village as nothing is left behind for me for survival after cyclone. Fire leaves at least some charcoals, cyclone washes cleanly'*- adds Vojon Jaladas, 65, Thakurtala, Moheskhali. There is only one cyclone shelter (capacity- maximum 250 persons) in the vicinity of Thakurtala village for about 3000 people of surrounding four villages. Reportedly, the higher-caste people of surrounding villages occupy the cyclone shelter beforehand. A fishing woman has to lead a stressful life always. A mother or a wife remains worried about her beloved. Here is a comment:

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preparedness and higher level of awareness attributed to the low death toll also. Importantly, the mangroves forest in the south-western coast is perceived to act as wall against the storm surges of cyclones.

*'We know about his expected time of arrival from the 'panjika' (Bengali almanac); the whole family including children keep waiting; we observe his every step in the home yard. A man changes dramatically in color and emotion after a long stay at sea. The children wait for new dresses and some sweets; the wife and mother want to have 'sarees' (clothes); sometimes he can bring, sometimes he can't afford; the worst thing is some of them never return' (Nelly Jaladas, 43, Thakurtala).*

For daily fishers, fishing becomes irregular. Sometimes, people hesitate to eat fish because of the perception that fish eat carcasses. I heard the rumor that a 'gold ring' was found in the belly of a *Hilsa* fish, though the fish is predominantly herbivorous. Such rumors lead to a decline in demand for marine fishes, thus affecting fishers' income adversely. It again means perpetual dependence on moneylenders and aggravation of already existing poverty.

The tidal upsurge in the monsoon, especially during the peak new moon and full moon phases, poses a big threat to the Thakurtala villagers; around 50% of the houses get under water fortnightly. Because of a regular intrusion of saline water, it is hard for the fishing women to grow vegetables in their homestead areas. One fishing woman comments: 'the salt assaults us (*lobon panir jala*) every fortnight during monsoon'. Cyclones also disrupt the harmony of the family and induce displacement. Here is a case from a key male respondent:

*'We lived in Ghonarpara under the Sadar upazilla. All our physical properties were washed away; the rich lost their boats and hence the scope of engagement in fishing boats was drastically reduced. My father was a steerer of a boat. They were 14; all others except my father died as the boat capsized near Sonadia Island. Luckily, my father survived. But he could not bear the trauma of losing his colleagues. We noticed drastic changes in his behavior, and he became 'mad' ('pagol') in less than a month. He instructed me not to be a fisherman before he died. Because of perpetual poverty, all my brothers started quarrelling. I was beaten one day by my elder brother; then I fled away from my house and took shelter in my maternal uncle's house at Thakurtala. I started working as a carpenter laborer ...In less than five years, I bought 3 decimals of land and constructed a hut. My mother is with me now. Because of short-circuit from the electricity pole, my small shop was burnt. As I had good connection with RIC (NGO), I got a loan of Taka 30,000 (US\$450). I started my journey again. Cyclone... fire... joblessness... poverty....these are partners of life here.'* Shimul Jaladas, Secretary, ECFC supported village organization, Thakurtala.

In the case of *haor* dwellers, fluvial floods<sup>13</sup> are like curse on properties and livelihoods. There is a miserable coincidence in between harvesting period and flash floods. An added level of misery, what Chambers et al (1981) term the 'ratchet effect', comes up when food scarcity in the pre-harvest seasons is prolonged (*Monga* or *Aakal*) and the physiological reserve of poor people severely depletes. People adapt surprisingly well with such a water level though the routine activities revolving around meals, sleeping and bathing change radically. In most cases, the number of meals comes down to only one a day; semi-liquid hotchpotch ('*khichuri*') is usually made by boiling rice, spices and vegetables together. Sufferings augment and persist in situations when there is no place to cook (as the houses are broken or go under water), little or no foodstuff to cook, pets and livestock do not have food for a prolonged period, drinking water becomes scarce, no room to sleep for weeks, spread of waterborne diseases and decline in civic status.

From my intensive case studies, I learned that women play critical roles during floods. Some of the activities most common among the households are: storing rice (*musti chal*) and dry food like cereals (*chira*), construction of temporary cooking units with redundant iron sheets, use of alum (*fitkiri*) to purify water, burning of dry tamarind ('*Holud gura*') to get rid of snakes, use of *neem* leaves for bathing to get rid of skin diseases, storing kerosene and easily combustible fuel like jute sticks, sending livestock to upland areas and freeing the ducks.

Natural calamities fetch differential impacts on the villagers; suffering of the elderly, children and pregnant women under any disaster situation is worse. The case studies from the fishing villages allude to the uncomfortable fact that natural calamities impact the women more heavily in terms of mortality, susceptibility to accidents and sufferings - a predicament of the prevalent gender inequalities of various kinds and

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<sup>13</sup> The causes and sustenance of floods are determined by climatological, geological and anthropological forces. During monsoons (mid-June to mid-August), heavy and prolonged rainfall ranging from 1270 to around 6000mm is experienced that generates huge run-off in the country. The total catchment area of the three major rivers is about 1.6 million km<sup>2</sup> which receives highest rainfall in the world. Coupled with the huge rainfall in the upstream Indian territories, on an average around 1.37 million cubic meters of run-off flows per year through the Bangladesh territory, of which around 1.17 million cubic meters crosses from June to August. The silt load is around 1.5-2.5 billion tonnes annually (Ahmad 1989). The riverine system fails to cope with such a huge influx of monsoon water, and most of the low-lying areas get inundated. Such a huge fluvial process causes enormous changes in the geomorphology through erosion and accretion.

magnitude. Women, especially pregnant and lactating mothers and adolescent girls, face special challenges due to almost absolute absence of sanitation facilities and critical health care challenges during floods and cyclones. Here is a comment:

*'All toilets in the villages are inundated ...we wait almost whole day for urination in the night time darkness somewhere... as we have very little to eat, we don't need to worry much for defecation; however situation is worse when someone suffers from dysentery or diarrhea.'* (Maimuna Khatun 45, Volarkandi).

The positive outcome of flash floods is that such floods enhance the biological productivity of the *haor* leading to a relatively better catch. It should be noted here that though the loss of properties is also remarkably high in long-lasting floods, yet the loss of human lives is negligibly low compared to cyclone victims on the coast. *'If the water level is beyond half-knee ('ek hatu pani') on the homestead level, then we suffer more; below that level, we can adjust somehow; we construct one bamboo-made bed ('macha'); we do everything on it--cooking, eating, sleeping--for all including humans, chicken and goats.'* adds Sufia Khatun (45) of Volarkandi. Such a coping psychology of the poor fishers for dealing with recurrent calamities with insignificant capital endowments and other asset bases, and almost independent of any government support, deserves compliments. Common people consider natural disasters as an 'act of almighty'; such a fatalistic aptitude is apparently a big relief to their numerous psychological traumas.

It is critical to examine how the fishing communities deal with uncertainties. The floodplain fishers have adapted well to live with the uncertainties and hazards associated with floods. As the water level rises, people have their own set of coping actions. However, no family in the study village migrated to high land areas so far, as the opportunities to find livelihoods is scarce, and most of the families have limited social networks with the upland dwellers. The type of disaster is an important determinant. In the case of slowly rising water level of floods, the households depend mostly on individual efforts to cope with and mitigate; it is only under unusual events that collective actions of fishantry as a whole are observed.

However, this is not the case for the coastal artisanal fishers. As predictions for severe cyclones are made from different sources, the community youth along with Red Crescent volunteers alert all the households for quick evacuation and restoration of dry

foods. As the village gets dilapidated, the households depend on their own efforts to erect the shanties with whatever is left by the cyclones. Afterwards, making the best use of their social networks, village leaders (*Sarder* and his associates) organize collective actions (involving at least one youth per household) for the following priorities: collection and burial of dead bodies, arrangement of treatment for the wounded, arranging 'quick food' (usually hotchpotch/*khichuri* made of rice, potatoes and lentils), repairing tube wells and latrines, erecting damaged houses and clearing fallen trees. Meanwhile, households adapt individual coping actions based on their capital and capabilities. These post-hazard actions are well-founded in the social memories of the village elders which they revitalize following every major cyclone. .

### 6.2.3. Seasonality and food security

*'Rain brings water to earth; it also brings water in our eyes. It affects our income, food, scope of cooking, sleeping, clothing, education, movement, almost everything. The torn thatches and polythene can't resist rain entering into the rooms. For us, flood means spreading salt on wounds.'* Madhu Bala Jaladas, 49, Thakurtala.

*'Water and dwelling in haor are synonymous. Flood brings fish, it is true. But can you eat fish alone? Sleeping and cooking are very difficult. Think about my infant; he has been affected by strong cough for the last three days. Where shall I go now in this situation?'* Salma Ara Khatun, 38, Volarkandi.

*'I can somehow eat two meals during dry period (sudin); for five months after that I have to forget what a square meal is.'* Sadhu Jaladas, 56, Thakurtala.

*'For a blind girl like me, there is no difference between a day and a night, between seasons. I can guess the seasons from outside temperature and rain. If my brothers give, I eat something. I know they will throw me outside home after my father's death; they can't manage food for themselves, how can they feed me?'* Kakoli Jaladas, 20, Gorakghata.

*"If I fail to give my crying son some rice, what sort of father am I? I am devalued and worthless to my children, wife and relatives. What can I do? It is about availability of jobs. It is the responsibility of the government to create jobs in the rural areas. There is no money without jobs and no food without money.'* Anil Jaladas, 50, Thakurtala.

There are numerous life experiences like these. The seasonality of the fishing profession is an important determinant of livelihood ill-being for many fishing families. This section examines the conditions of food security and the impact of seasonality on the livelihood functions. The basic argument is that food shock has become an almost inevitable characteristic for the majority of fishing households that impose strong physical and psychological bearings. In the real life, the perennial problem of the fishantry lies in the

fact that fishers have to draw a balance between the availability and seasonality of the fisheries resources, and the persistent pressures for meeting at least the basic requirements for family members. Unlike peasants, who can cultivate on extra land (if available) to offset the crises, fishers are limited from expanding their production broadly by ecological characteristics and access to resources, meaning they have very limited options. The fishing economy is distinct from most of the rural professions in the sense that it is usually a low-capital and low-technical one; there are seasonal fluctuations and uncertainty, and members of the fishing families play vital roles from the principle of generalized reciprocity to meet the common pool needs of the members as an organic unity. The economy primarily centers on ensuring basic needs or food security.

Household food security<sup>14</sup> is closely connected to livelihood security; when a family's livelihood is secure, it tends to be food secure as well. According to Sen's (1981) entitlement point of view, entitlements are either owned by individuals as endowments or can be exchanged suitably for other commodities needed by individuals, and people access food through their socially-derived entitlement relationships. People become vulnerable to food insecurity or even prolonged starvation if their endowments fail to produce food, and their capacity to exchange labor or other goods and services cannot be translated into enough food. This can occur without a decline in the aggregated food supply (Blaike et al. 2000).

It is observed that food crises during lean seasons impact the individuals differentially within the family. Generally it is the responsibility of the household chief to ensure the availability of sufficient food for all members irrespective of 'age and gender' so households can be sustained as productive and reproductive units. I mentioned specifically about age and gender because of the fact that the parents, specially the mother, is forced to eat less when there is a food crisis. Also, there is evidence of

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<sup>14</sup> Quite a large number of terms like hunger, poverty, food insecurity, etc. are used interchangeably in the livelihood literature. It is important to distinguish between them as they bear different meanings. Mukherjee (2004) mentions that hunger is a state in which people do not have enough food to provide them the required nutrients for an active and healthy life; food insecurity is a state in which people consume inadequate amounts of food because they do not have access to sufficient nutritious food to sustain an active and healthy life, and food security is a state in which, at all times, there is food in the system. Food that is available is culturally acceptable, has the required nutrition and there is no institutional sanction against accessing the available food.

depriving girls because of the prevailing perception that '*they will leave to in-law's house and sons will take care of parents as permanent residents of families*'. Culture and religion impose some stringent bindings; food eaten by a Hindu widow is usually separate from other family members; this is however not applicable to a widower.

Table 6.3 reveals that most of the livelihood activities of the floodplain inhabitants depend considerably on the annual rainfall and water-logging period. Fishers and farmers switch and adjust their activities based on this rhythm of the water cycle. The agriculture pattern tuned to the flood pulses and land elevations deserve special attention<sup>15</sup>. The *haor* inhabitants classify their lands generally into four types: a. upland (*taner jomi, vita bari, ucha jomi*) b. medium upland ('*jerer jomi*') c. lowland ('*shail jomi, nichu jomi*'), and d. depressed land ('*doba jomi*' or seasonal waterbody). The height of the land is one of the deciding factors in determining the cropping pattern and human settlements. I noted 9 types of cropping combinations (rice and other crops) around Volarkandi village. There are landowners who make a 'temporary village' in the *haor* areas with their cattle for the paddy harvesting period, and meanwhile their cattle enjoy green grasses of the lowland areas. Again, there is the existence of unique 'nomadic sharecroppers' ('*jiratee*') who along with their family members settle in rice production areas and leave the area on boat with their shares as the water swells up. A flash flood not only destroys the crop, it creates problems for the farmer like a scarcity of seeds, loss of money, want of food stuff, incapability to repay loan and borrowing again.

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<sup>15</sup> The local variety of *Aush* can adjust with the fluctuations of water cycle; however farmers tend to incline towards HYV of *Boro* and *Aman* instead of local the varieties. Farmers of the downstream areas tend to use less fertilizer as the decomposed aquatic vegetation releases huge nutrition. The use of the one-buffalo plough is unique in the area.

**Table 6.3: Seasonal calendar of floodplain fishers in the haor combining both fishing and paddy farming** (Source: FGD on 17 Jan. 2006)

Important activities	Months												
Bengali months ==>	Baishakh	Jaishtha	Ashar	Srabon	Bhadra	Asshin	Kartik	Agrahayan	Poush	Magh	Falgun	Chaitra	
English months ==>	Apr-May	May-Jun	Jun-Jul	Jul-Aug	Aug-Sep	Sep-Oct	Oct-Nov	Nov-Dec	Dec-Jan	Jan-Feb	Feb-Mar	Mar-Apr	
Rainfall*													
Major agriculture practices													
Cultivation of Boro**							Seedling	Planting				Harvest	
Cultivation of Aush**	Seedling	Planting			Harvest								
Cultivation of T. Amon			Seedling	Planting			Harvesting						
Vegetables production	Summer vegetables						Winter vegetables						
Irrigation	River								Seasonal & deep beel water			River	
Water logging and flash floods		Water logging									Flash floods		
Fisheries													
Fishing in waterbodies	Perennial	Seasonal ( and also perennial)					Perennial waterbodies						
Fishing and fish abundance	Broods	Fingerlings	Subsistence fishers join			More fish			Medium to low catch		Kantha***/beel drying		
Size of fish	Brooders		Large sized carps			Beel resident medium and small species					All sizes from Kantha		
Gear efficiency	Gill nets, traps, hooks and long lines, cast nets, low-meshed illegal nets							Traps/hand fishing		Encircling gears			
Livelihoods related													
Diseases		Cough, fever, diarrhea							Skin diseases				
Economic situation		Better income from fisheries								Food & income crisis period			
Productive activities by women	Homestead gardening and forestry, duck rearing, rod fishing												
Maximum marriage ceremony									Socially organized				
Ranching		Duck ranching						Cow ranching on upland areas					

Legend: \* Subject to local and year variation. Fishers and farmers of Volarkandi prepared this calendar based on their experience of 2005)

\*\* Boro, Aush and Amon are local paddy varieties; \*\*\* Kantha- Fish aggregation devise

The existence and development of a rural non-farm economy is important because it greatly helps to mitigate the problem of under-employment and unemployment substantially through absorbing incremental unskilled and skilled labor forces. I was told that the 'rural road maintenance' project of CARE (NGO) and local government has been very useful for destitute women in the past. The scope of such non-farm activities is so limited in coastal and wetland areas. Another limitation of non-farm manual jobs is that the employers choose physically strong adults and young, and thus families with a higher civilian labor force (CLF) and old/sick persons have little access to such labor-exhaustive jobs. *'I have five members, each with a mouth; one has been sick for months, two are too young to work; my husband finds work on boat for 5-6 months; I find work for road construction for 1.5-2 months only, not all the year; how can all these mouths be fed? Can anyone give me an answer?'* Nelly Jaladas, 43, Thakurtala, adds with anguish. The scope of on-farm labor utility has been negatively impacted by the increased use of fertilizers, hybrid seeds and irrigation, and in a few cases small tractors.

Fishing is broadly a seasonal occupation, and this seasonality<sup>16</sup> aspect together with the amount of catch and access right provide an appropriate context for getting ideas on temporary nature of earnings from fishing. Monsoons generally limit the flow of rural economy and accessibility to informal jobs because of water logging, inaccessibility, and many other similar adversities. Female-headed households become worse hit compared to male-headed households as torrential rains often tend to hinder the mobility of women to on-and-off farm workplaces. Table 6.4 illustrates the income variations of different categories of fishers. It is seen that income level falls to around 30% or less compared to that of good seasons. The income per fisher goes down as low as half a dollar/day in lean fishing periods and with that scanty income, familial expenses are to be met. The WorldFish Centre (2005) showed that the average household level income/yr. of Bangladesh marine fishers was US\$ 2100-7200 (*cited in Dey and Kanagaratnam 2007:5*)

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<sup>16</sup> Though seasonality plays a critical role in the livelihoods of fishers, it is good from a biological point of view. Monsoons and rough weather allow many marine fish and other organism to breed and grow with less susceptibility to catch by fishers at immature stages. For some fishermen living near the estuary, monsoon is a blessing as freshwater fish and prawns also come down in the estuarine zone for breeding under the influence of almost zero salinity fluvial water. At the advent of flash floods in floodplains, fish come out of perennial *beels* for reproduction. However, monsoons can hardly prevent floodplain fishers from fishing.

and inland fishers earned US\$500. It is not clear whether the classification includes low-tech artisanal fishers or only marine industrial fishers. However, based on empirical findings of this research, it can be inferred that a vast majority of the artisanal coastal fishers do not earn even one-fourth of the lowest range of the stipulated income throughout the year.

Bad seasons usually start with the advent of the rainy season. Good seasons for fishing are not homogenous for different types of fishers and ecosystems. Monsoons bring good luck for inland small-scale fishers, while it is a bad period for most of the coastal gear operators. At the individual levels, income level is higher in the floodplain areas. However, it is higher when considered on fishing unit basis in the coastal ecosystem. Income per fisher drops sharply when the total profit is distributed among 10-20 crew members. Catch level is of little significance to those fishers who are paid on a contractual basis.

In the fishing villages, women in the extremely low-income households are heavily involved in economic activities (mostly around their homestead-based productions and in nearby fish landing centres, dry-fish processing centres, etc.), which contribute to the tune of 23-67% to the household income depending on the period of involvement, availability of work and number of working women. The contribution is around 72-100% in the case of independent livelihoods managed by women-headed fishing households, with whatever amount of income they have from multiple sources. Because of the poor livelihood resilience, fishing households slip deeper into poverty, resulting in further marginalization of gender-induced inequalities (FGD in study villages, Dec. 2005).

**Table 6.4: Seasonality of income for different groups of fishers (1US\$=Taka 65).**

Major gears	Coastal area				Floodplain area					Remarks
	ESBN	MSBN	Gill net	Hook & longline	Gill net	Lift net	Traps	Push net	Cast net	
Good seasons (US\$/day)	3-8	4 - 40	5- 50	3-30	2-5	1.5- 5	2-5	0.5- 2	1- 2.5	Income level is highly variable on day to day basis
Bad seasons (US\$/day)	1-2.5	2-5	2-9	1.5-8	0.7- 1.2	0.7- 1.3	1-1.5	0.3- 0.5	0.4- 0.7	

*Source: compiled from case studies and validated through FGDs in April 2005 and Dec. 2005*

*Note: Monsoon is usually considered good seasons for inland fishers, while dry seasons are considered good for coastal fishers. Most of the coastal fishers cannot continue fishing due to bad weather condition.*

Fishers reported that there is a decline in moral order during bad seasons. Especially in the lean season, everybody becomes desperate for catching fish irrespective of size and conservation values. It is the consumer demand<sup>17</sup> for fish in the market that drives the fish harvest throughout the seasons; markets absorb all sizes of fish; there are good customers for small immature fish also. Fishers enthusiastically discuss the importance of fish conservation during the time of interview, but after hours, they engage in fishing using destructive nets. This diagonally opposite trend in their perception and practice may be viewed as an outcome of 'livelihood negativity', an absence of collective consensus and proper enforcement.

Fishers become desperate as prices of essential commodities rise. One coastal fisherman (Jamini Jaladas, 68, Thakurtala) added *'ultimately, who wants to see his children starving? What one has got to do when family members starve frequently? What is the guarantee that I will get higher catch in the future? Today is more important than tomorrow'*. In most of the cases, the harshness for managing day-to-day meals forces fishers to do unsustainable desperate fishing. I found there is a linear relationship between the poverty level and mesh size. Poor fishers tend to use low-cost fine-meshed gears (In the *haor*, there is an exception: wealthy and powerful fishers also use large destructive '*Kapri*' net). Larger meshed nets were used earlier to catch larger fish as no one wanted to eat small fish. With the decline in economic status, mesh size also declines. The advantage of small meshed gear is that such gear provides assurance of at least some fish, which are crucially needed for income for day-to-day sustenance. Fishers hardly feel guilty or suffer from pricks of conscience for *jatka* (immature *Hilsa*) fishing. Fishers working as laborers carry out instructions of the boat owners for catching small-sized *Hilsa* and they have no right to argue against such decisions. The policy implication of the seasonal pursuits of income is that government needs to create job opportunities for at least one able person per fishing family in low-skill non-fishing sector.

Table 6.5 shows a picture of the food stock situation in the two study villages. It is seen the incidence of zero stock is higher in the coastal village (47%) compared to the floodplain village (29%), which is a clear manifestation of a higher level of poverty and

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<sup>17</sup> The demand is exacerbated by occasional demands raised due to 'Bird Flu' disease or similar crises in poultry and livestock.

lower level of income diversity in the coastal site. From the intensive case studies, I noticed that the food stock situation in a family is not static or ideal; rather situations tend to aggravate during monsoons and summers in coastal and floodplain areas respectively. Floodplain households reveal a relatively better position which is attributed to their access to terrestrial agriculture and arable land. In the coastal village, poverty situation aggravates when most of the fishers fail to go to the sea for setting nets because of life-threatening bad weather. The island is saturated with 'rickshaw' (tricycle) peddlers and other laborers who engage in manual jobs. As a result, there is hardly any scope of jobs left for new competitors. The salt production fields are washed away and few tourists visit the region. There is a tendency among households to store rice as much as possible; however fishing women of the coast stock dried fish also.

**Table 6.5: Food stock in coastal and floodplain fishing families (multiple options allowed)**

Food stock (Multiple options)	% of HHs		Amount (Kg)		Value (US\$)	Source of food stock	Remarks
	C	F	C	F			
No stock	47	29	-	-	-	-	Interestingly, some higher medium and rich people were also found reluctant about food stocking as they could cope with any price level. The poor failed to stock because of poor earning. Allocation of rice is too little for families with around 6 members. For many families, next meal inputs were uncertain.
Rice	38	57	1-7	1-4	0.25-0.35/kg	Purchase for day to day meal	
Wheat	3	-	5	-	0.22-0.3/kg	-	
Paddy	5	27	40-160	34-400	0.16/kg	Own source as sharecropping	
Potato	15	9	4-7	-	0.16/kg	-	
Dry fish	25	17	2-15	0.5-3	1-7/kg	Saved from own catch, price vary with species; sun dried or smoked.	

*Source: Field survey 2005, Legend: C-coastal fishing village, F-floodplain fishing village*

Seasonality plays a strong role in determining the economic condition of households in both villages. Table 6.6 reveals the economic situation of fishers in different months of the year. It is apparent from the table that the monsoon is a bad period for coastal groups, while it is a kind of 'blessing' for floodplain fishers. Winter is generally good for all categories of fishers in terms of fish availability, stable income and risk of fishing. It is evident that most of the fishers in both the villages take meals with cheaper pulses and vegetables during the crisis period and only a small section (coastal 13%, floodplain 23%) of the households has the ability to eat meat.

**Table 6.6: Economic situation of fishers in different seasons***(No. of respondents: N=30 for coastal village, C and N=22 for floodplain fishing village, F)*

Months →  Economic condition*	Percentage (%) of households											
	<i>Baishak- Jaistha</i>		<i>Ashar-Shraban</i>		<i>Bhadra- Ashin</i>		<i>Kartik- Agrahayan</i>		<i>Poush- Magh</i>		<i>Falgun- Chaitra</i>	
	Mid-Apr.- Mid-Jun.		Mid-Jun.- Mid-Aug.		Mid-Aug.- Mid-Oct.		Mid-Oct.- Mid-Dec.		Mid-Dec.- Mid-Feb.		Mid-Feb.- Mid-Apr.	
	C	F	C	F	C	F	C	F	C	F	C	F
Surplus	13	14	10	23	13	18	13	18	17	18	13	18
Equal	23	27	13	36	30	36	23	41	30	32	23	27
Scarcity	64	59	77	41	57	45	64	41	53	50	64	55

\**Surplus: Some amount is left after modest livelihood; Equal: Hand to mouth, Scarcity: More expenses than income, lending is obvious; Key: C-coastal fishing village, F-floodplain fishing village*

It is crucial for the fishers to get through the *monga*<sup>18</sup> or pseudo-famine. The coping strategies are elaborated on in section 6.3 of this chapter. Always the poor and functionally landless people fail to secure food because of a lack of a regular flow of money from gainful employment and lack of macro-institutional support services. Table 6.7 provides an account of meal statistics of the fishers. It was beyond the scope of this study to figure out the nutritional adequacy and caloric value of the meals. I depended solely on the fishers' perception in this regard. Given the manual nature of jobs, fishers consider three meals/day as adequate for them during good seasons and two meals/ day for the lean seasons and any frequency less than that is indicative of an insecure food condition. I was given a basic calculation by an experienced fisher:

*"Look, I have a simple calculation for you; every third person that you meet in the village remains hungry almost throughout the year and every second person remain hungry during the 'lean fishing periods'. It might be worse in some years when there are other troubles like cyclone" (Sudharam Jaladas, 55, Thakurtala).*

This *emic* view reflects substantially on food insecurity. Using one meal/day as an indicator, we see that around 27% coastal fishers and 19% floodplain fishers suffer from chronic hunger during normal seasons, and 44% coastal fishers and 32% floodplain fishers are forced to a state of seasonal hunger in the crises seasons respectively. Around one-fifth of the coastal population is forced to have irregular meals or starvation. If the

<sup>18</sup> *It is a much talked about annual event, especially in the northern districts of Bangladesh. During the months of Ashin and Kartik (mid-September to mid-November), job opportunities dry up before the main harvest season begins in December. As a result, thousands of poor people go without adequate food for months. The situation worsens if there are devastating floods. With this, the poor become ultra-poor, and those on the margin of poverty line again go back below the poverty line. The overall poor economic condition and little employment opportunity in the area forces the poor to circular migration.*

adequacy of meals for nutritional security and physical strength is considered (3 meals a day), then around 80% of the fishers are victims of food security irrespective of seasons. Fishers' insecurity is strongly prevalent for around 4-5 months when demand for wage labor goes down (usually mid-April to mid-September in coastal areas and mid-September to mid-November in floodplain areas respectively).

**Table 6.7: Meal statistics (N=30 and 22 for coastal and floodplain fishers respectively)**

Food availability		0-half meal/day	1-1.5 meal/day	2 meals/day	3 meals/day	Rice consumed gm/adult/d	Foods/curry preference with rice (multiple choices)				
							Pulse	Vegetables	Fish (wet/dried)	Meat	Others
Normal period	C	10%	17%	50%	23%	200-250	57%	63%	73%	30%	17%
	F	5%	14%	64%	18%	250-300	45%	41%	59%	27%	9%
Crisis period	C	17%	27%	36%	20%	150-200	43%	57%	33%	13%	23%
	F	9%	23%	50%	18%	100-150	45%	55%	32%	23%	14%

*Source: Field survey, Legend: C= Coastal village, F= Floodplain village*

*Note: There are geographic variations for the period of normalcy and crisis. While winter is good for all categories of fishers, monsoon is the most critical period for coastal fishers, but it is a high-catch and high-income period for inland fishers. Nobody in fact measures how much food one eats, but the women have measures of how many handfuls of rice are cooked for a family, which is turned into quantitative measures as gram/adult/day.*

One important feature that remained unnoticed by the researchers is that food insecurity disrupts family harmony and undermines the role of the father as 'household head' in the family, thus creating room for the women to capture. It is often the women who play a critical role in planning and managing food through rigorous austerity with whatever amount of food they have for the family members. Food shortages seriously affect their physical condition and working ability as they almost solely depend on professions requiring ample physical energy. Inadequate food affects intra-household members differently, and it is usually the non-staple food items (like size and number of pieces of fish, egg, amount and part of meat, etc.) that reveal gender disparity, especially during the crisis period. Most of the fishing households remain on the cross-roads between marginal and severe food deficits, and any small incident forces them to face prolonged hunger.

Lipton (1993) argues that 200 days/year should be considered as a minimum 'employment period' for rural livelihood. However, fishers consider that at least a working period of 275-300 days/year would suffice for fulfilling their basic necessities. Poor fishers spend 55-83% of their income for purchasing rice and during low income periods, the percentage of income spent to purchase rice only gets higher (70-83% of the total income). The wide prevalence of hunger and malnutrition has bearings on physical

well-being, attendance and performance at school, reproductive health of women, costs associated with health care and ultimately the asset status of families. All these negations have long-term impacts that often tend to carry over for generations. Cyclical and acute food shortages along with extremely poor sanitation and living conditions keep the children vulnerable to sets of waterborne and malnutrition-related diseases and physical deformities which are hard to recover from.

It is widely known that some peasants of rural Bangladesh migrate to urban areas to find manual works in their off-cultivation seasons. I discussed this option in both villages. My impression is the communities are not willing to take the risks and uncertainty of migration. A small group of floodplain fishers mentioned their experience. Five years ago, this small group of fishers migrated to the Kaptai reservoir of Rangamati district for fishing, while was the dry months in the wetland areas. They had to come back as they were threatened with kidnapping by a local group of tribal insurgents. However, there is a pattern of circular migration from the upland areas to lowland areas. Seasonality stimulates migration for some of the fishers from neighboring areas. As in the floodplain, seasonal fishers from the upland areas of 'Habiganj' and 'Nabiganj' migrate to nearby areas in the Volarkandi and Pabijuri villages. Though they apparently compete with the local fishers, they are never challenged by the local fishers for their access to the locality.

*'We are father and son on the same boat; this is our house, sleeping room; a medium for transportation and fishing; we operate lift net for 3-4 months; then we leave as the water starts to recede. Whatever we get after the whole day's operation, we sell in the local market and then buy our foods. We have everything here what we need for a household, except the family (some rural people use the term 'poribar' or family to mean wife only); occasionally we give some fish or money to the leaseholders if he asks for that; at the end of the season, we can save around Taka 5000-10000.'* mentions Bashir Miah, a nomadic fisherman of Nabiganj.

In the food crisis period, the assistance from the government is insignificant compared to the need. Many poor remain outside the safety net programs of the government; they lack the ability to approach the appropriate government machineries to mobilize resources. The food assistance program, meant for the extreme poor, are often

misappropriated or captured by the relatively wealthier class<sup>19</sup> which promptly maintains the right linkages with higher order administrative and political power sources.

Here is a case of tyranny:

*'I appealed to the local union parishad for a VGF (Vulnerable Group Feeding) card; I was told by the chairman that the respective member will look into the issue. The member wanted bribe from me; he mentioned that he had to spend for the government officials to issue such cards. I did not get card as I had no money to bribe. If I had the ability to bribe, why should I run behind a VGF? I would rather buy rice with that money. Sumita of the neighboring village got a card with bribe who had two earning members; I have none and I depend on extending hands for help to others. This is called irony of fate.'* says Saroda Jaladas (62), a destitute woman, Thakurtala.

The lesson that can be drawn from this case is that good governance and transparency is critical to making the best use of the government efforts to address poverty at the grassroots level.

#### **6.2.4. Inherent social stressors: Dowry**

*'I had to pay much more than usual as my daughter was dark in complexion; she crossed 20 and became a big burden for me; I was sleepless at night considering her security... there are 'evil eyes of miscreant males on grown up girls' around. If anything 'wrong happens' (indication to sexual abuse) to her, she will never be married and ultimately there will be no escape for her except death. She left after marriage but left us under '3 feet of water' (to mean debt); only 'thakur' (God) knows when we will be able to repay the loan. There is still pressure on me to have some more expenses for the in-law; he wants money for business. I am about to be 'on the road' (literally to be in a condition of begging); two more daughters are 'coming up' (to mean growing fast to catch the age of marriage). Oh the tyranny of marriage of women!'* excerpt of life history of Minoti Jaladas, 40, Thakurtala.

*'I can't run my families with the scanty income. A very hard choice for me--shall I save some money for my daughter's dowry or buy medicine for my sick husband? My daughter is growing up fast; the age after ten is 'dangerous'. A matter of Taka 40,000-60,000 (US\$ 700-900). Those who are proposing are also poor. Without dowry, they can't run a marriage ceremony on their own. ...I can't sleep at night. Is there any way out for me?'* Saleha Begum, 46, Volarkandi.

*'I have three daughters waiting for social marriage, but I am incapable of arranging marriage; my sorrows are fathomless, larger than the size of the sun and the moon together; these cannot be solved in one's human life'* - Kalyani Jaladas, 47, Thakurtala.

*'To be born as woman in fishing family is surely a curse from Allah.'* Maimuna Khatun, 45, Volarkandi fishing village, Baralekka.

*'You are not a woman; you won't realize our sorrows and sufferings well.'* Anguri Bala Jaladas, 40, Thakurtala fishing village, Moheskhal.

<sup>19</sup> Corruption has been so institutionalized that the persons involved with these types of activities do not feel ashamed or take the responsibility of power misuse or abuse. In a recent anticorruption drive by the caretaker government, many 'Members of the Parliament' (MP) were found to have used tins (galvanized roofing sheets) for their own business, houses, factories which were allocated for the poor who needed relief. Tins were kept hidden under mud. The biscuits allocated for the flood affected poor were misappropriated by the MPs for feeding their pet horses. These are some of the samples of the widespread nature of corruption and misuse of power by the political leaders and government officials. Some of them are from religion-based parties, who sell lessons of religions to people for votes.

Family crises of Minoti, Saleha and many others typically exemplify the grim situations that prevail concerning the marriage and dowry as an established socio-religious institution in typical Hindu and Muslim fishing villages. These statements also reveal that dowry is entirely the product of the forces of gender disparities in the society. From what was confined to only the upper castes/classes in the south and other regions of India (Kapadia 2002, Srinivas 2002), the dowry system<sup>20</sup> has gradually become a pan-Indian phenomenon pervading almost every section, class, caste and religion and even the more egalitarian tribal communities, particularly during the past one and a half decades (survey result of 'All India Democratic Women's Association-AIDWA', *cited in* Srinivas and Bedi 2007). A similar situation is prevalent in Bangladesh also. To me, the prevalence of dowry through the transfer of endowments and entitlements to grooms is a social authentication of male supremacy, thus creating a sense of disequilibrium and hierarchy from the very beginning of conjugal life. Ignoring the productive roles in family (detailed in section 4.4.2 of chapter four), women are largely viewed as child production machines<sup>21</sup>. In the fishing villages, girls are usually viewed as 'familial burden' and enemies of 'rice pots' and 'family cash', meaning they do not add to the household income but keep exhausting it.

Almost each household with a daughter faces a similar crisis. Fishing families with young girls are usually subject to a '*future dimension of poverty*', as they will inevitably fall further below the present line of poverty for arranging social marriage and paying the dowry. Here the ordeal test of social marriage and the amount of dowry is determined ('*bier bazare daam*'- literally demand in the marriage market) by the economic endowments of girl's parents; family reputation and caste identity; 'age, body

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<sup>20</sup> Dowry is not unique to India. It is a practice that has existed in several European and Asian societies for centuries. Hughes (1985) points out that the dowry system dates back at least to the ancient Greco-Roman world (332 BC–284 AD) and in medieval Europe, the dowry system was well established among a large number of social and economic groups. Despite the widespread prevalence of these practices, with modernization, Europe has witnessed a decline and disappearance of dowry (Anderson 2003, *cited in* Srinivasan and Bedi 2007).

<sup>21</sup> Specially in the case of Muslim fishing village, it is quite expected that girls get married when they reach an age cohort of 14-18 and keep giving birth at intervals till their first born get married elsewhere; meanwhile 1-2 kids are usually lost from the family register because of neonatal complexities and host of diseases before they reach five.

shape/color and character of the girl<sup>22</sup>; basic education, and extra womanly qualifications like the 'ability to cook, sing songs and sewing'. Voice, walking style, length of hair and many more traits also matter. The general trend is to find a groom of an upper 'family and economic status', but low dowry sometimes reinforces a girl for getting married with the lower one (like someone already married or very old or physically handicapped). Among many other attributes, dowry has been institutionalized in rural Bengal due to the psychological helplessness of the parents of brides who become powerless to the alien kinship groups through marriage.

In the study villages, I observed that dowry ('*Joutuk*') is imposed by the groom side, rather than the conventional dowry usually offered by the bride side as part of social marriage. Besides cash, the parents of the bride have to bear huge expenses incurred for lavish hospitality, clothes, furniture, ornaments and kitchen gadgets. Yet the groom's relatives, in my observations, usually look for faults rather than extending cooperation during marriage ceremonies. Here is a comment:

*'As part of the social custom and marriage, we have to display what we are giving for our daughters. The parents and close relatives of the male counterparts have to be satisfied about the quality of the goods as per previously settled deal, otherwise they may create obstacles on the ways of final rituals of marriage and later, may not send the bride or grooms to bride's natal family. The value of dowry what my parents paid for me has gone up 12 times in my daughter's case in around 20 years, though my daughter looks more pretty than I was at her age...before the newly-wed couple enters home, the goods have to be in the groom's house.'* Sidhu Bala Jaladas (38), Thakurtala, Moheskhali Island.

Srinivas (2002) argues that dowry money is far from being 'a rotating capital fund' for the earning family as some imagine it to be; what it leads to is certainly the impoverishment of the girl's parents, and it does not always ensure security for the girl in her in-laws house. Dowry has multi-faceted manifestations with negative repercussions on perpetual indebtedness, asset base and landlessness, medical treatment, food security, education, and family harmony. A moneylender, who was known for a show-up with

<sup>22</sup> The old fishers mentioned that arranging marriage prior to 'experiencing menstruation' of the girl is the best; the old fishing women got married at the age of 10-12 years; with more age, the amount of dowry increases. A fair complexion is considered lucrative irrespective of whether the male's colour; 'a male is a male, body color is not important for him'; the girl has to be virgin and never linked or in love with any male; if so it will be considered as '*kolonko*' (bad reputation) for the girl. Accusing the girl for any sexual misdeed in rural society is a common trend. The popular saying '*Kurite buri*' meaning 'girls over twenty years of age are not well-suited for marriage' is a testimony to the tradition of early marriage.

gifts and consumer durables during his daughter's marriage perceived that *'he paid for his daughter to ease economic burden of the in-law's family, to buy honor and power for his daughter and also to save prestige in the society'* (excerpt from an interview with Bibhuti Jaladas, 60, Thakurtala). Because of a marked gender hierarchy, transactions between the parents as past protectors and the in-laws as future providers have long survived as a bequest mode. Thus women's productive roles remain demeaned in almost every aspect of society. The situation is so acute that many young girls and their parents dream of finding jobs as domestic servants (15-18 hours of home-making activities per day, no holiday, monthly salary is around US\$7-10, foods and clothes given free) in the houses of wealthy urban people with the intention to accumulate money for organizing marriage.

It is difficult to receive authentic information on the exchange. In the caste-based fishing villages, I found the village leader '*sarder*' prepares documents on the exchange provisions, but in the Muslim fishing village, it is mainly an anecdotal gentle agreement or occasionally mentioned in the '*kabin nama*', a written document on marriage. Depending on the wealth category of the fishers, I calculated the amount of dowry together with other costs for social marriages of girls; their parents have to bear expenses around 3-9 times their net annual income. For the poor, it is proportionately higher while the ratio is relatively less for the wealthy fishers. However, excluding other costs of marriage, the villagers reported that the total value of dowry (gold, gift, cash and consumer durables) varied from US\$ 155-770 (Taka 10,000-500,000) and US\$ 230-17,000 (Taka 15,000-11,00,000) in Thakurtala and Volarkandi respectively based on the economic condition of the parents. In the latter case, higher dowry has been influenced by remittance money and a show-up for higher social status<sup>23</sup>. In this interpretation for the wealthy section of the community, a bride offered with ample cash, costly dresses and ornaments advertises to other women her socio-economic dignity. I learned from focus group discussions that the role of mother-in-laws (almost unavoidably, who and her women relatives also had to suffer for dowry) is interestingly in favor of dowry; they

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<sup>23</sup> In the *haor* area, the number of people attending the wedding feast is a matter of prestige; the number of persons is not usually counted by head, but usually by the number of cows slaughtered or number of micro-buses hired for the bridegroom attendants.

consider their son's marriage as an opportunity to build capital for the families for paying dowry in their daughter's marriage. There are anti-dowry laws, but hardly is there any compliance to those (considering the peace and safety of the bride); social acceptance of such laws is limited.

Another set of threats like macro-and-micro-level law and order situations, inefficiency of local administration and police, poor housing condition of fishers, and the absence of adult fishermen for months keep the grown-up women and early widows in serious tension specially at night. This has serious corollary on the livelihoods as the fear of sexual assault limits the entry of women in the labor market, free movement to markets for economic transactions and also enrollment rates for education. 'Virginity in brides' and 'chastity in wives' are considered most fundamental values in the socio-cultural constructions of Bengal. There is hardly any ethical approach to know about such assaults where the victim herself keeps her mouth shut. I was trusted to be informed by a key informant about a few incidents in the Hindu fishing villages where young girls were sexually assaulted by thugs, but the parents did not disclose it nor sought legal actions because of threats to their lives, their subservient status as a minority<sup>24</sup> and the low caste inferiority syndrome, lack of money and legal support to take the battle into court, and most importantly, the fear of not being married due to being 'polluted'. Such inertia and the absence of legal actions, on the contrary, favor the miscreants. However, this is not the case in Volarkandi where the physical presence of a male inside a house at night, the sense of being from the religion of majority and a strong social order prevent women from being assaulted sexually.

#### 6.2.5. Diseases

One sick (physical or mental) person can be a source of permanent shock for the family. Here is a case from Thakurtala fishing village, Moheskhali:

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<sup>24</sup> The very political history of Bengal has been based on divide and rule by the British regime; the Pakistani military regime has always mistrusted minorities as 'pro-Indian' and forced them to evict through promulgation of sectarian vested property rules for grasping lands (*Orpito sampotti aine*) of minorities. There has been a series of violent sectarian attacks especially on the Hindus in the near past ignited by fundamentalist political leaders. The declaration of Islam as the state religion by military dictator H. M. Ershad is perceived to beat down the religious freedom of the minority segments in the country ranging from Hindu, Buddhist and Christians. Yet broadly, common people are pious and demonstrated harmonious living in a secular culture.

women keep giving birth for sons in the hope of better future earnings. A comprehensive picture of gynecological and post-natal diseases was not obtained, but it is assumed to be bad. Women tend to keep their female diseases '*top secret*' as long as they can bear them.

#### 6.2.6. *Perpetual dependence and debt*

There are different reasons behind the perpetual debt condition of most of the fishers. I already discussed about the seasonality of income. There are familial roots of inherited 'old poverty'. In the economic dimension of fishanry, I mentioned the coercive patron-client relationships that evolved following extensive mechanization of the artisanal coastal sector in the last three decades. For conceptualizing fishanry, I mentioned that the very nature of the ecosystem, produce, social-economic-cultural and political characteristics prevalent in the rural fishing villages are supportive of massive exploitation. In analyzing the root causes of debt, I have picked up only two issues for discussion. I will discuss the marketing chains for both the floodplain and coastal areas, and then I will focus on moneylending specifically for the coastal village.

The very nature of a marketing chain in a small-scale fishery tends to be exploitative in nature. Acheson (1981) argues it is very difficult for fishers to market their produce successfully because of their physical absence from the markets and also adjustments in the time of marketing. Fishers establish long-lasting ties with moneylenders/middlepersons to reduce the uncertainty in marketing fish and obtaining capital<sup>26</sup>. The arguments hold good in my case also. Going slightly further, I want to assert that the institutional supports required in a dynamic marketing structure are not within the reach of the subjugated fishers.

There are two different schools of thought regarding middlepersons. Middlepersons in fish marketing are usually viewed as 'parasites', 'exploiters', 'living off' the fishers (Stirrat 1974: 189-190, *cited in* Alexander 1995: 241), while some researchers (Alexander 1995) view middlepersons as integral and unavoidable who bear the risk of uncertainties inherent in the production systems from the marine environment. I argue that the concept of unilateral exploitation by a middleperson is both theoretically and empirically inadequate. I assert that the fisher-middleperson relationship is an

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<sup>26</sup> Wilson (1980) terms this as fundamental weakness of the neoclassical model of economic interaction.

inevitable outcome of the peculiarity and uncertainty of the fishing occupation itself backed by customary political economy, policy of the financial institutions, socio-cultural structures and traditions. Such coercive production relations generate inequality<sup>27</sup>, but at the same time serve some socially important functions.

Some attributes need to be seriously considered that compel the fishers to lean towards the 'middleperson-managed guaranteed marketing' though it is exploitive in nature. Some of these are: fisher's inability to link with the wider markets for different reasons, perishability of the produce, peculiar exigencies of occupation, fisher's inability to spread over marketing uncertainty, dependence on the middleperson for numerous social<sup>28</sup> and economic safety nets and caste-kinship ties, and absence of alternative cooperative marketing. A critical question is 'why do fishers not directly participate in marketing?' Several propositions can be thought of, among which I have singled out two major reasons:

1. after working the whole day or night in a labor-intensive risky venture, fishers get physically and psychologically exhausted; and
2. they are lacking the amount of 'social influence, technical means, capital and on the whole power' needed to 'enter and sustain in the market' that is principally controlled by some 'business thugs'.

In this section, I will examine the marketing chain and inherent exploitation. The marketing structures vary from very simple to very complex. Fish, as a perishable item, has to be marketed as raw and wet (locally preferred) as soon as possible after being caught. Some fishers, however, convert the raw produce seasonally into a sun-dried and

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<sup>27</sup> The functionalist theory of inequality advocates that inequality is inevitable if a society is to motivate people doing the most valuable things; the conflict theory (advocated by Karl Marx) holds that social stratification is based mainly on control over productive resources such as technology, capital and territory (Peoples and Bailey 1997:270). The inequality is both an end of socio-economic stratification and a means of exploitation. The existence of inequality in the fishing villages itself generates some social needs which the moneylenders and other influential leaders tend to fulfill to exert their control over production system.

<sup>28</sup> In one fishing village in the southeast coast, I found that Muslim middlepersons, using their own political and social networks, played a vital role in saving the traditional Hindu fishers during a countrywide riot and sectarian violence in 1998. They hired night guards to protect the fishing villages. I asked a Muslim middleperson about this. He mentioned that if the Hindu fishers were killed by miscreants or forced to migrate, their fishing business would face serious losses. On the other side, Hindu fishers also were happy to see the protective roles of the Muslim middleperson.

enzymatically fermented product to diversify their choice and economy. In the case of floodplains, Table 6.8 shows the price of some commercially important fish in different hands. Floodplain fishers usually get 50-60% of the 'urban market level' price.

**Table 6.8: Price differences (values in US\$) at different layers of marketing**

Commercially available species	Fishers get from 'foria'	'Foria' gets from retailer	Consumer pays to retailer	Remarks
One 5 kg big <i>Catla</i>	5.4-6.15	6.9-7.7	9.23-12.31	3-5% operational costs at each level of intermediary. Profit margin is largely affected by the type of species, freshness, customers' preference, demand and level of supply. In rural floodplain areas, 'forias' sell mostly in the small markets while in urban markets the marketing chain is a bit longer and further complex. Size of species is very important. For example, the price of a 3 kg <i>Ruhu</i> ( <i>Labeo rohita</i> ) is 5-6 times higher than a one kilogram size.
1 kg of medium sized <i>Ompok</i> spp. (15-20 pc.)	1.85-2.15	2.46-2.77	3.08-3.85	
One piece of 2 Kg. size <i>Walagu attu</i> ('Boal')	1.85-2.31	2.31-3.08	3.85-4.62	
1 kg small sized <i>Puntius</i> spp. (40-60 pc.)	0.62-0.77	0.84-1	1.07-1.23	
<i>Guilsha</i> ( <i>Mystus</i> spp.)	0.77-0.92	1-1.23	1.23-1.54	
<i>Chapila</i> ( <i>Gudusia chapra</i> )	0.62-0.77	0.85-1	1.07-1.23	
Small prawns	0.77-0.92	1-1.15	1.23-1.38	
<i>Shoil/Gazar</i> ( <i>Channa</i> spp.)	0.92-1.08	1.15-1.31	1.38-1.85	
1 kg size 'Ruhu/Mrigel'	1.08-1.23	1.23-1.46	1.38-1.85	
Mixed species	0.46-0.77	0.69-1	0.92-1.23	

Source: Compiled from field notes on series of market observations, 2005

The scenario is more complex and exploitative on the coast. Data presented in Table 6.9 reveal that fishers get around 40% of the urban-level market prices, but what needs to be mentioned here is that fishers and their family members can get better prices if they manage to sell their produce in the local market.

**Table 6.9: The 'marketing cycle' of some commercial catches from fishers to consumers (values in US\$, 1US\$= Taka 65)**

Commercially available species	Fishers get from local stockist	Local stockist gets from urban stockiest	Urban stockist to agents	Commission agents to 'big' retailers	Big retailer to small retailer	Consumer pays to retailer or vendor
1 kg size <i>Hilsa</i>	0.62-0.85	0.92-1.08	1.0-1.15	1.05-1.23	1.15-1.38	2.15-2.5+
1 kg medium size Bombay duck (20-25 fish/kg)	0.31-0.38	0.54-0.69	0.58-0.77	0.6-0.8	0.69-0.89	0.85-1.15
1 kg pomfret (2-3 fish/kg)	1.23-1.54	1.54-1.85	1.69-2.0	2.0-2.23	2.15-2.46	3.08-3.85
1 kg medium size shrimps (30-40 pieces/kg)	1.07-1.23	1.38-1.69	1.54-1.85	1.15-1.30	2.07-2.31	2.62-3.08
1 kg medium size marine catfish	0.31-0.42	0.46-0.62	0.62-0.77	0.77-0.85	0.85-0.92	0.92-1.15
1 kg medium size ribbon fish	0.38-0.49	0.46-0.62	0.62-0.69	0.77-0.85	0.85-0.92	0.92-1.23

Note: 3-5% operational costs at each level.

Source: Based on interviews with relevant stakeholders and market observations, 2006.

Fishers who receive loans ('dadon') from the moneylenders or wholesalers will have to inescapably hand over their catches to the lender at the end of the trip at the fish landing centre. There is hardly any bargain over the price and the fishers or small boat

owner have to comply with the prices fixed by the moneylenders. There is a socio-political notion behind this economic dependence. To be a middleman, one requires political power, connection with local administration, money, strong bargaining and oration capacity, and access to fish storage facilities, which most of the common fishers lack. The following example can be cited as an instance: around seven years back, the fishers of Sitakunda, Chittagong attempted to sell their fish directly to the urban markets. After a few days, the fishers on their way to market were attacked and beaten mercilessly by the local thugs employed by the Muslim moneylenders. All their fish 'caught free from the sea' were thrown out and their houses were burnt at night. The miscreants remained unpunished. Such incidences keep traditional fishers constantly threatened and psychologically dormant. So, keeping silence remains a helpless option for the fishers. Following comments of the fishers are reflective of the reality:

*"If I get less fish, it is a problem for livelihoods as I will get less price after selling; if I get more fish from the trip, it is also a problem. The middleperson will talk about 'too much of catch and less demand' of fish that time; there will be artificial crisis of ice blocks in the market. In such situations, where can we go with the perishable wet fish? All fish species cannot be dried. For marketing, it is never possible to bypass them. So finally, I have to surrender at a price that is 'kindly fixed' by the wholesalers. What a horrible profession! You are cut by the both ends of the sword." Sukhendhu Jaladas, 56, Thakurtala.*

*"They (moneylenders) exploited my grandfather, my father and now me; they will do so for my son and grandson; they are like leeches." Sudhangshu Jaladas, 65, Thakurtala.*

*"You can't do without inhaling oxygen; oxygen is mixed up in the air; moneylenders are also like oxygen; fishers can't do without them; they are the first and last resort for urgently needed money; they are efficient rural bankers." Maloti, 54, Thakurtala.*

I argue that the moneylending system is deeply rooted into the existing socio-cultural structure, and the moneylenders provide some critically needed services to the borrowers which other lending organizations like microcredit-lending NGOs can not provide. Microcredit, as a tool for poverty alleviation and empowerment, particularly of women, has gained credence in development dialogue the world over. Compared to the formal lending institutions like banks, microcredit institutions tend to be much more flexible and non-bureaucratic in respect to loan purpose, interest rates, collateral requirements, maturity periods and debt rescheduling (Ghate et al. 1992:9, cited in Roth 1997). Usually, as the poor fail to reach banks, they approach NGOs; when NGOs fail to provide loans as demanded, they approach moneylenders. Clearly there are some

loopholes in the operational management of loans by the NGOs. The moneylenders, despite their exploitative roles, operate within this vacuum of socio-cultural and political space.

I examined who exactly are covered under the term target group by the NGOs. If we consider the basic ethics like who deserves to be prioritized and then pulling the last on the list to be first, then the extreme deserves attention. I found that NGOs nowadays target those 'who can repay', rather than those 'who need capital support'. From the Rapid Rural Appraisal (RRA, June 2006) on the relative wealth ranking of the loan recipients from NGOs in Thakurtala fishing village, I found 58% of them are from relatively better medium families, while 30% and 12% are from the poor and extreme poor categories respectively. The most deserving poor and extreme poor categories are not trusted well by NGOs. Almost all borrowers from NGOs in both study villages complained the weekly repayment of 'kisti' (installment with interest) is counter-productive and they are forced into another chain of indebtedness, and thus micro-credit has transfigured as 'credit fundamentalism' to its borrowers<sup>29</sup>. Several NGOs are in operation on Moheskhali Island; these are RIC, COAST Trust, SEP, ASA, GSK, and the Nobel winning Grameen Bank. The loan ceiling is Taka 2000-15,000 (US\$ 35-275); effective rate of interest is around 25-40% per year<sup>30</sup>. NGOs usually do not consider the fishers eligible for a handsome loan as their profession is full of risk and uncertainty and also they can hardly be reached for loan recovery as they remain outside the village for most of the time. Fishers have no access to government commercial banks as they fail to satisfy the requirements for 'mortgage', followed by the extra 'speed money or bribe' required for a loan.

<sup>29</sup> The calculation is very tricky. One boat owner from Moheskhali borrowed Taka 200,000 (1US\$= Taka 65) from NGO- BRAC at an interest rate of 12.5% for 18 months. With 18 months long payment on installment basis, the capital and interest stands at Taka 237,500. As the paperwork was ready for this loan, he found the loan is issued for 15 months only at Taka 15834/installment. On the first day, Taka 10,000 was deducted as 'savings'; the borrower in fact used the capital for 7.5 months, though legally he was expected to utilize Taka 200,000 for 18months. The effective rate of interest is around 30% and it will be more if we deduct Taka 10,000 taken off on the first day.

<sup>30</sup> For example one woman took a loan from an NGO for poultry rearing or vegetable gardening. She will not be in a position to get saleable items of poultry or fruits/vegetable in a week, but she will be forced to repay loan installments from the next week of receiving the loan. The logic from the NGO side is they want to minimize risk of defaulting through a rigid mode of payment. As she fails to repay the installments, she approaches other NGOs or moneylenders. There is hardly any business in rural areas that would yield profit in a week.

Clearly this is a shift from the humanistic approach widely adapted by NGOs in the early seventies and eighties, to a more profit-centred efficient credit lending institutions (Buckland 2004). As mentioned earlier, NGOs mainly use the group dynamics of saving groups for the recovery of the loan (around 99% in most cases), but fail to use these social capitals for true social mobilization for empowerment. One NGO field officer said it well:

*'Ultimately this is business. As an employee, I am responsible for collection of money from the field, if I fail to do so, default money will be deducted from my salary; why should I be risking myself for the poor? The poor 'eats up' major part of the loan for 'calming down their family bellies'. Where will they invest and make profit? A poor is a poor by destiny and will remain as a poor, nobody trusts them.'* (interview with Mahbubul Islam, 38, NGO personnel, Moheskhali)

Many villagers term micro-credit as formalized efficient pseudo-usury system with different sets of tactical terms and conditions. It is said that the '*dadonders*' occasionally give waivers on interests but the NGOs never do, rather the NGO activists do everything possible (like snatching domestic animals, taking off roof tin, taking off ornaments) for full recovery of their money. I found there are some elderly members of different NGOs who are engaged in a different type of usury system; they borrow higher amounts of money from the NGOs (interest rate @ 25-40%/yr.) and lend that money to non-members at a much higher interest rate (@180-240%/yr.). There is little or very limited scope of utilization of money for productive purposes. This is especially true for the landless. One borrower can refund money with interest only when his/her income surpasses the amount of installments over a certain period of time; otherwise s/he is bound to become a defaulter. In such instances, the activists come forward with a greater loan amount and deduct the previous unpaid amount to 'regularize the transaction'. At one stage the loanee becomes loaded with the pressure of the extra amount of loans. The microcredit programs create favorable grounds to accelerate the '*dadon*' in some cases in the way that to avoid becoming defaulter, the loanees have to borrow from moneylenders to pay the installments of the NGOs.

Table 6.10 shows some prevalent types of '*dadon*' that I recorded from the study area. Fishers receive '*dadon*' for a host of reasons (like feeding family members in non-fishing seasons, dowry, emergency treatments, purchase of gear, renovation of craft, etc.).

**Table 6.10: Prevalent forms of 'dadon' (moneylending) observed in the fishing villages**

Types	Basic features (US\$1=Taka 65)
'Bondhoki dadon' (Mortgage loan)	The lender keeps ornaments, land documents, silver, motorcycle, nets, engine and similar valuable goods as mortgage depending on the amount of money. Around 80% of the total value worth of the mortgage is given as loan; loan for 1 year maximum; capital along with monthly interest is to be paid on installment; yearly interest rate 84%-120%; interest grows up at compound rate. Fishers take this loan for purchasing or repairing boats, engines and nets prior to fishing season. On failure to repay, mortgaged properties are owned by lenders or sold out at lender's unilateral decision. Loan size usually varies from US\$60-2250
Fishing 'dadon'	The wholesalers or stockist of the fish market provide this type of 'fishing dadon' to the owners of boats (ranging US\$150-7500) at the beginning of the season for numerous expenses on the condition that all the costly exportable high quality fish will have to be handed over to the lender at rates fixed by him. The boat owner can not sell fish elsewhere without informing lender; price set by lenders is usually 15-40% less than the existing market rate; additionally 4 kg fish for every 100 kg kept by lenders free as an excuse for 'dirt in raw fish'. After each trip, price of fish is cut down; amount due is shifted for next seasons but with no interest; the lender seizes boats and nets in case of total failure
'Mashik dadon' (Monthly loan)	Small lenders do business in their own villages with a limited capital; medium level families are seen to be engaged in this type rather than the big recognized lenders; fishers' wives or fishers prior to their fishing operations lend small amounts of money; no signed document but the account is maintained by the lender; in case of failure in monthly installment, interest is compounded; limited in numbers. Loan size was found to vary between US\$ 7.5-90; interest 120-244% per year
'Trip dadon' (Trip-based loan)	Owners of small boats get this loan from local lenders when they face crucial problem in course of fishing operations. The amount given is for a single trip period of 15 days. The money is to be paid back in full amount with the interest at the end of the trip. In case of failure, at least interest is cleared. Moneylender can seize boat or net for equivalent amount of money after 3 months; no written agreement; money is given in presence of steerer and a few more fishers. Loan size is US\$ 150-300; interest is 60-100% per month
'Sonadia dadon' (Sonadia Island-based loan)	A widely known usury system for the 'dry fish producers' and medium level boat owners usually taken for construction of fish drying yards and buying raw fish. Loan size varies from US\$300-3000; loan taken for 5-6 months; Taka 10,000 is paid as interest for an amount of US\$1500 each month; remainder is credited for the next season without interest. Usually no written agreement; a plain signed paper is kept for new loanees
'Sadashya dadon' (NGO member loan)	Old members of NGOs with access to higher amount of loan from multiple NGOs lend the money to non-members or who are in emergency; usually confined among the villagers and no written document is kept. They give NGOs @30-40% per year but lend to others @100-120%/yr. Profit margin is high. Loan around US\$15-75
'Pan dadon' (betel leaf loan)	The Moheshkhali Island is famous for her delicious betel leaf in the country. Small farmers and seasonal fishers get this usury from the local wholesalers of betel leaves. On market day, the farmers supply leaves to the stockist and the stockist deducts the price on the basis of 'grade or quality of the leaves'. Usually farmers get around 60-70% of the urban retail market price; loan varies from US\$ 30-150, no compound interest
'Moushumi or dhani dadon'	Usually during monsoon seasons the paddy farmers get the loan for 'Aman' plantation. Farmers give 7 'ari' dried paddy (around 122 kgs) to lender for every

(Seasonal or paddy loan)	US\$ 7.5; benefit level over US\$ 7.5 is US\$ 4.90 at the end of 5 months. No interest or installments in between. Loan is around US\$ 15-75; interest around 10% a month
'Time dadon' (Time-based loan)	Taken for familial urgencies; interest paid on weekly basis; if somebody fails to repay the capital at a time, the interest continues to be paid. The loanee has to go to lender's house for paying the money; loan size US\$3-30; interest 5% per week
Current dadon (Electrifying loan)	This implies the worst form of usury; extremely poor people become victims of this usury; interest rate is low on a daily basis but very high on a monthly basis; no written agreement or mortgage; one witness required. Loan size US\$3-30; interest 1% a day or 30% per month
Hazari dadon (Thousand based loan)	The <i>Hilsa</i> netters take this for a certain lunar period prior to <i>Hilsa</i> season. Two conditions: no interest but 50% of the existing market price for the catch or US\$3 as interest for every US\$15 (Taka1000) at the end of lunar cycle; loan size US\$75-750; interest rate 40% per month
'Chal dadon' (Rice loan)	This special type is recorded from the Muslim fishing villages- 'Meheriapara, Taziakata, Ghotibhanga and Charpara' of Moheskhali. The women lend money and take rice instead of money for interest as receiving interest is prohibited in the religion. For every US\$75, a bag of 40 kg rice is to be given by the loanee after 3 months. Loan size US\$75-150; interest around 50% per year

Source: Series of FGDs, case studies and key informant interviews, Moheskhali Island, 2005-2006.

Hindu fishers usually receive '*dadon*' from the same-caste moneylenders if the amount is small, but the Hindu boat owners (who are again money lenders within community) consider it safe to receive loans from the Muslim wholesalers whom they consider 'powerful thug' with a view to protecting fishing assets and getting 'social security' in the event of sectarian violence. In most of the '*dadon*' systems under which documents are kept, the signed papers are kept blank to the lenders. Later, on failure of payment, the lenders reportedly put exaggerated figures and conditions beyond the verbal agreement and capture properties of the borrower. I investigated a series of '*dadon*' cases in Thakurtala fishing village and came to know that three fishers (Bachon Jaladas, Nilmoni Jaladas and Bamacharan Jaladas) had to leave the village as they failed to repay the loans. Jatish Jaladas, a boat owner of Thakurtala, received a loan of Taka 400,000 (US\$ 6155) from four moneylenders that cumulatively increased four times in four years. He had to sell all his boats, nets and land properties to get rid of the loans, but his indebtedness continued. One fisher committed suicide as he eventually failed to repay his loan. These types of negative cases are many in number in the coastal fishing villages.

### 6.3. Coping strategies and livelihood diversification

Each family has a different epic of struggle for addressing poverty correlates and traps, and socio-economic transitions and tensions. How do the poor families figure out their

coping actions? Salmi (2005: 24) nicely conceptualizes that *'for each life-mode there is a corresponding specific conceptual universe which is quite distinct from that of other life-modes'*. Murphy and Moriarty (1976) put forward that coping strategies of households may include defense mechanisms, active ways of solving problems, and techniques for overcoming manifold stresses. Marschke and Berkes (2006) provided an account of the resilience-building mechanisms in the face of multiple stresses and shocks among the fishers of Kompong Phluk and Koh Sralao, Cambodia. Some of the actions that helped to build resilience are: formation of local committee, rethinking local actions for mangrove and fishery conservation, patrolling to prevent theft and illegal activities, monitoring general environment, use of social networks and exchange of labor, diversification into non-fishing activities, growing fingerlings for aquaculture, creating fish sanctuary, and more interaction with NGOs.

Section 6.2 examined some important sources of vulnerabilities and their impacts. In this section, I will examine the mechanisms fishers use to re-establish their livelihood functions using some dynamic strategies. This section, based on empirical observations, puts forward a set of common actions taken by the fishers in their food crises period. Such coping actions are intricately related to livelihood resilience. I want to illustrate one of my 'intensive household-level cases'- 'Nirala Jaladas' (Thakurtala fishing village, Moheskhali, Cox's Bazar), that provides details about the real life struggle in the fishing villages.

#### **'An epic of struggle for survival'**

Her husband Bijay Jaladas (45) was part of a fishing crew. The boat was capsized by a cyclone on 3 July 1997 near the *Sunderbans* mangroves forest in the sea. All the 12 crew members died except the steerer.

His dead body was not found, and there is no direct witness of his death. As per social custom, she has to wait one 'juga' (12 years) and after that she will be declared a widow. Nine years already passed way. *'Can you imagine how a woman with no income can run a family of nine? I have 4 daughters and 4 sons. Think about those days. He gave me Taka 5000 (US\$ 85) that he had borrowed from his sister before he left home. The news of boat capsized fell on my head like a thunder....It was difficult for me to manage even a single meal a day for all; I used to prepare a paste of cooked rice and vegetables; sometimes I had something as leftovers, some other time nothing was left for me; I had to go to sleep after drinking a glass of water. How long can one fast? My son did not get sufficient milk from me as I could not eat; I was losing weight fast. Out of hunger, they used to cry out at mid-night; I used to press on their bellies so that they didn't feel the bite of hunger. After two months following the boat accident, I took the job as a labor in the fish drying yard. Filthy and smelly environment; all the rotten fish are dried there. I had even no hand gloves; my body used to smell horrible. My youngest son often suffered*

*from diarrhea and dysentery as he used to suck milk from my 'dirty body' (literally breast feeding) during the work.* ' Nirala continues.

Despite such grim poverty and hopelessness, Nirala Jaladas took the manual job of repairing muddy roads under the management of CARE Bangladesh. With what she was able to save, she managed to settle marriages for three of her daughters with very little offerings and dowry to the bridegrooms, partly depending on support from relatives and neighbors. Now she has a debt of Taka 16,000 (around US\$ 240) with the women's group, shopkeeper and moneylenders. She has been in perpetual pressure from those who lent her money for returning the capital though nobody tries to get any interest from her. One moneylender, however, grabbed her homestead land. NGOs did not give her loan as she was considered incapable of paying weekly installments. In the last nine years, she did not buy any clothes-old or new. Her eldest son read up to class four and then ended up as a child labor in a small boat. Last year, she got a 'VGF card' (Vulnerable Group Feeding) from the local government. In a year, she got 16 kg rice and Taka 100 (around 2US\$) (note: officially 20 kg, local chairman kept 4 kg for 'miscellaneous costs').

What is noteworthy in this case is that Nirala, in the absence of her husband, had to take reality-driven decisions; she had to borrow from her kin; she developed techniques to minimize sufferings of hunger; her social relations extended beyond her village as she received critically needed support from a local benevolent person; she had to work hard to manage at least a meal a day for her sons and daughters; she benefited from a rural construction project and vulnerable feeding programs; she had to make complex negotiations with many outside attribute and yet she complies with all the social rules and regulations.

Each household has different defensive mechanisms with sets of relationships and networks that are subject to continuous renewal, acceptance and rejection based on the services, reciprocities and conflicts of interest. With differing degrees of dependence, fishers have both positive relationship categories (usually including relatives, friends, kin, neighbors) and negative relationship categories (hostile groups that negatively impact the livelihood functions of poor fishers at different layers). Members of the poor fishing families can signal well about the advent of 'bad days', and a psychological preparation surfaces among the members. Urmila Jaladas (42) of Thakurtala fishing village comments from her experience:

*"Each fishing family itself is a story of coping actions for mere survival. Each year, we face serious food crises during monsoons; monsoons and storm surges damages whatever scanty we have; fishing is suspended; there is no work in the locality as the heavy rain and flood disrupts all activities around; we exhaust stocked grains, cut off all expenses, sell the livestock, do whatever we can to earn some money..... and the final action is mental preparation for prolonged starvation; our kids also know about these ups and downs'.*

This psychological preparation is important for all the poor households. Once the crises are over, fishers sharpen their experiences or social memories that help them to undertake precautionary mechanisms in future shock and stresses. Table 6.11 provides a general picture of survival strategies and coping mechanisms. These coping actions are broadly categorized into six major categories:

- i. reduced food intake and nutritional quality (eating less food, irregular meals, purchase of foodstuff on credit, exchange of foodstuff with neighbors),
- ii. reduction in family expenses (deferring social celebrations like marriage, and avoiding new clothes/ medicines/ educational materials/house repair),
- iii. monetary actions (use of savings, loan from different sources),
- iv. use of other capitals (leasing land and fishing equipment, selling of properties and valuable effects),
- v. intensification of labor (use of excessive physical labor of the adult and child), and
- vi. other actions (like displacement, change of profession and begging).

Each of these categories involves some specific actions, which vary from family to family. It is seen from the Table 6.11 that women in both villages have to take less food or irregular meals compared to their male counterparts. It is interesting to note that though the fishers mentioned a series of important crises they face, they tend to focus more on day-to-day survival strategies. The inevitable consequences of a decline in family income during bad seasons are reflected in the quality and quantity of food intake. Food-insecure households make strategic decisions to bridge their consumption deficit, and also to draw balance between its longer term economic and social costs. Decisions of poor households to food ration can be viewed as their attempts to deal with the current endowment sets and to maximize household's long-term entitlements (Devereux 2001). It is argued that people convert endowment sets into food entitlements to avoid starvation, but there are situations when people sometimes chose to starve rather than sell their productive assets, and this can be accommodated in the entitlement approach using a relatively long-run formulation for 'future entitlements' (Sen 1981: 50). This means that poor people are capable of analyzing and predicting their endowment and entitlement conditions on a longer term.

**Table 6.11: Coping strategies during crises (based on multiple answers, N=30 (coastal) and 22 (floodplain) (Cl.-Coastal, Fl.-Floodplain)**

Coping actions	Male (%)		Female (%)		Seasonality/ Remarks
	Cl.	Fl.	Cl.	Fl.	
<b>Reduced food intake and nutritional quality</b>					
Taking less food, new food habits	47	15	60	32	Rainy seasons
Irregular and regular fasting	60	21	47	26	Worse in coastal village
Foodstuff on loan	22	3	5	2	Do
Exchanging food with neighbors	25	14	5	5	
Purchasing foodstuff from shoppers	15	3	10	1	
Exhaust reserve food	3	7	4	5	Reserve foods include seeds/ dry fish/ rice etc.
<b>Reduction in family expenses</b>					
Deferring social celebrations like marriage	27	14	4	1	
Celebrating unavoidable festivals with poor entertainment	23	14	60	32	Simplify occasions and rituals
Avoiding new clothes/ medicines/ educational materials/house repair	63	28	32	5	
<b>Monetary decisions</b>					
Use of savings	7	3	2	1	Anytime of the year
Loan from neighbor	15	2	2	1	Dry seasons
Loan from moneylender	41	3	2	-	Rainy
Loan from NGO	25	14	4	5	Any time of year
Loan from relatives and friends	8	3	2	2	As above
<b>Use of other capitals</b>					
Land lease/mortgage	1	-	-	1	Rainy seasons
Fishing equipment leased	3	1	-	-	As above
Sell fishing equipment	4	-	-	-	
Sell big trees	5	1	3	2	Dry and rainy seasons
Sell fruits/livestock/poultry	17	3	5	4	Rainy seasons
Sell gold/other valuable effects	1	5	-	3	Any time of the year
Homestead land sale	1	-	-	-	
<b>Intensification in the use of family labor</b>					
Excessive physical labor	7	2	5	2	Rainy seasons
Child labor	23	4	5	3	Do
<b>Other actions</b>					
Helplessness/ fatalistic attitude	31	11	9	6	Any time of year
Displacement/ migration	2	2	-	-	Dry seasons
Change of profession	3	6	2	2	Dry seasons
Begging	2	-	2	1	Any time of year
Temporary migration	3	-	1	-	Do
Return to parental house	-	-	3	7	In case of husband's early death, desertion or divorce

Source: Focus group discussion in the Thakurtele and Kalyanpur villages

Source: Focus group discussion in the Thakurtala and Volarkandi village, June 2005.

Sen afterwards put forward the notion of 'extended entitlements' (Sen 1986, Dreeze and Sen 1989) to cover 'socially legitimated' entitlements that were not conferred

by market mechanisms; these included intra-family allocation of food, or what has been labeled as 'dependency entitlements' (Bongaarts and Cain 1982, *cited in* Devereux 2001: 250). Differential inter-household power within the community usually tends to translate differential impacts during crises. Usually the children and old cohorts suffer worse because of their increasing physiological demands and poor bodily resilience respectively, and under any given situation, usually the females, irrespective of age, suffer most.

The sets of the most common and identifiable sequential actions that I developed based on intensive cases and validated afterwards with some other poor families of the villages are shown in Figure 6.5. However, variations in sequence can be observed based on capital base, familial choices in actions, composition of families and overall condition of the food deficit situations. Different households calculate their own sets of priorities making an analysis of pros and cons of each action during a food deficit period. For all categories of families in the study areas, the most common economic strategy is to save and build up endowments, at whatever amount possible, to offset the sufferings of food deficit period. However, it is quite usual that the most vulnerable families begin and move along the coping actions earlier and faster than the relatively better-off families in the same locality. In studying the households' responses to declining food entitlement in western Sudan, Teklu (1992) observed that the poor households usually take up the route of substitution between and within family consumption in order to draw a balance between their basic needs and the familial income and asset paths. Strategies that relate to self-exploitation (like austerity in consumption, starvation) are usually adopted first, while the actions that are difficult to reverse (selling of goods) are adopted later.

It is apparent from Figure 6.5 that fishers initially depend on the grain stock; then they depend on '*musti chal*'<sup>31</sup> followed by eating less costly foods; then they reduce their number of meals; after that they start borrowing from multiple sources and sell or mortgage whatever they have. Watts (1983) argues that as the sequence progresses, 'family-based resources which do not entail a loss of productive assets are replaced by those which involve a broader set of market and social relations and do involve the

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<sup>31</sup> It is an age-old practice that many poor women of rural Bengal pick up one handful of rice (*musti chal*) from the budget of rice for each meal; this accumulated rice serves as stock during crisis periods.

liquidation of assets' (*cited in* Campbell et al. 1991: 78). The final step in this sequence is starvation and taking food occasionally, what Chayanov (1966) termed as 'family exploitation' for the peasant family. Fishers continue to starve on regular or irregular basis up to the extent of physiologically bearable condition for many of them.

The development practitioners can use these coping actions as indicators of livelihood ill-being (Figure 3.2). Some policy and management interventions suggested by the fishers are: a) special recognition of the fishing villages as 'disaster prone' and 'seasonally food deficit' zones, b) food aid program for the most vulnerable (widows, deserted women, physically weak persons, etc.), c) microcredit support with zero interest, d) allowance in the no-fishing time, e) government support in marketing fish products in overseas markets, and f) special initiatives for accommodating unemployed and underemployed persons in labor-intensive industries (e.g., garments manufacturing, shrimp processing factories) (source: FGD with Thakurtala coastal fishers, June 2006, followed by discussions with 7 key informants of floodplain and coastal study village, September 2009).

One of the most common strategies is to compromise with the quality of meals. This strategy involves avoiding costly foods like meat, lessening the use of cooking oil and ingredients and cooking very low quality foods compared to the 'normal earning period', followed by reduction in the amount of intake per meal, and/or number of meals per day. From my intensive household level case studies, I found that fishers took meals with only green chilies, a small piece of onion or a paste of rice and locally harvested vegetables when they lose the ability to cook curry separately. I observed that poor fishers in both villages used to eat jackfruit as 'complete meals', which is less costly, and the seeds were cooked later as curry. While eating jackfruit is a matter of luxury and nutrition for the wealthy section, it is an indication of worse economy in the case of the poor. Poor families exercised one or multiple actions of 'forced austerity' to offset the crisis, but in cases when the shocks retain for a longer period (or repeats) than usually expected by families, the poverty level is further aggravated.

From the household level case studies, I found that the women as household-in-charge shift their dependence heavily on wild and backyard domesticated plants during crises periods. More dependence on the 'famine or pseudo-famine foods'<sup>32</sup>, harvested from the nearby natural food systems like small wetlands or hills, becomes so distinct and characteristic for the poor families during food deficit periods. They boil stems of wild plants like arum (*kachu*), 'maitta alu' (wild yam), green banana, and grown vegetables like gourd, radish ('mula'), cauliflower and cabbage as a replacement for rice. As the amount of rice allocation per day goes down<sup>33</sup>, the amount of vegetable trashes increases on; they do not cook a separate curry with oil, rather they prepare a paste of small amount of rice along with some vegetables. Twigs of banana and green banana paste are very useful in filling up and tightening the stomach with the feeling of 'being content' with very little food; rice allocation drops to 30-70gm/meal/child which is around one-fourth of their need (pers. comm. with Nirala Jaladas, Thakurtala).

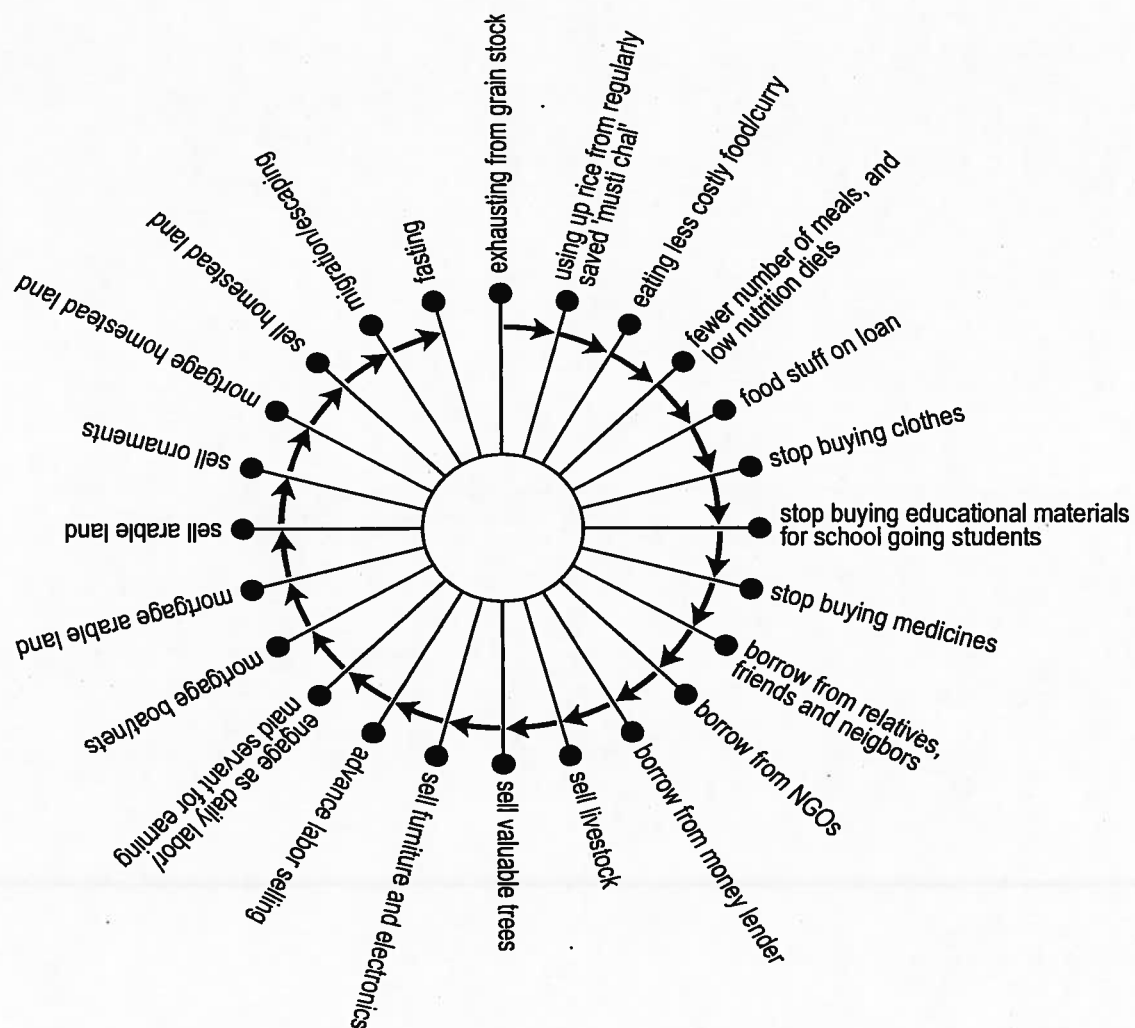
Typical of fishantry in both the study villages, I observed from the intensive case studies that within each family, there are both male economy and female economy. When the male-induced economy collapses, the female economy plays a distinct and cautious role. When both economies collapse, the families face serious crises. This is not to say that there are conflicts between two family economies, rather both are usually complementary and supportive to each other. The female economy is based on rigorous savings through austerity and selling of products from home-based livestock, poultry, dry fish, smoked shrimps and vegetable products. During the food deficit period, fishers generally try to manage money from near relatives (observation: *kinship reciprocal obligation or moral economy is still higher in coastal villages; children and the old are*

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<sup>32</sup> Characteristics of famine food in fishers' interpretation: *foods usually not preferred during normal period and often culturally not appropriate for the majority in the community, usually gathered from wild sources, little or no use of spices and oil, same food taken repeatedly without choice, often little amount provisioned compared to the actual need.*

<sup>33</sup> Usually it is considered that an adult Bengali should eat 450 gm/day (475 gm/day rice is considered as the minimum amount for an adult in India, as reflected in their 6<sup>th</sup> Pay Commission of the government) as part of a local dietary habit along with 80 gm lentils, 100 gm vegetables, 200 ml milk and some fish or meat. (source: Interview with Agro-economist Dr. Mahbub Hussain, The daily Samokal, Source: <http://www.shamokal.com/details.php?nid=93426>, April 2, 2008). I found that to reduce the amount of food intake, some women put excessive salt and green pepper in the curry as a 'cruel tactic' to reduce food consumption by the children. Many children were seen to behave angrily when they were not provided sufficient food by their parents and the mothers usually had to play a vital role in cooling them down.

*prioritized in benevolent exchanges*) and then from neighbors; then they try to obtain credit from NGOs and other informal sources. This is chiefly because relatives and neighbors hardly talk about interest and have a common realization about crises. However, when crises affect a wide section of the community, the rural institution of 'moral economy' among kin relations tends to break down. The common trend is building 'economic safety nets' with activities like poultry, livestock, and intensification of vegetable gardening in a very limited space.



**Figure 6.5: Cycle of coping actions observed in the fishing villages during severe crises**  
(Source: Intensive case studies and participatory observations, validated in mini-workshop on 29-6-2006)

For some of the fishers, foraging fish becomes a seasonal coping action. Serious food scarcity is a prime mover for children and women's active involvement in foraging

for small and discarded fish in the fish landing areas. Socially accepted custom allows for small fish fallen from the baskets in course of handling and transportation of fish from mechanized vessels becoming the property of the poor foragers. Fish assembled from the beach thus not only play a significant role in family nutrition and gourmandizing, but also in earning a small amount from the sale of the surplus to the low-income customers. The income earned through foraging (US\$ 5-13/month/indiv.), though insignificant, yet plays an important role in ameliorating the grim situation of food scarcity. Also, such a scanty amount of income from foraging plays an invaluable role in those families where adult male fishers fail to cling to fishing due to disease or accidents. The immediate consequence of decline in the catch level on the livelihood is that the scope of foraging on the beach for remnants becomes sharply limited.

From the tea stall-based informal discussions ('*adda*') with fishers, I gathered this impression that the working class people view the success of the political governments through a simple evaluation of 'price of rice'<sup>34</sup>. Here is a comparison:

*'During Hasina's governance (1996-2001), rice was selling at Taka 10-12/kg and oil was at Taka 25-30/liter; the daily wage value was Taka 50, meaning that the money earned was enough to buy 4 kilograms of rice. During Khaleda's period (2001-2005), rice was selling at Taka 25/kg and oil at Taka 70/liter. With a wage of Taka 70/day, I can't buy the basic necessities; politicians tell the poor to eat potatoes; do they eat potato themselves? Do they know the sufferings of hunger? The way I can allocate food for several family members with cooked rice, I can't do the same with potato; rice is rice and potato is potato; nothing can replace rice and it is difficult to change food habits.'* says Sunil Jaladas (55), Thakurtala (1US\$= Taka 65).

For an artisanal fishing community of Poomkara, Kerala, Nieuwenhuys (1989) mentioned that prolonged starvation during lean fishing period is inevitable in the fishing villages; fishers tackle such lingering hunger with much endurance through sleeping long hours and gossiping with friends and family members; their efforts for livelihood diversification is insignificant and they remain mostly confined to fishing-related activities (maintenance and repair of the crafts and gear). The same observation applies widely to the coastal fishers of the study village. Additionally, the scope of an arable

<sup>34</sup> During the time of writing this chapter, price of rice went up to Taka 35-40/kg and oil to Taka 120/L, while there has been hardly any change in income levels. Both the poor and lower middle class are known to suffer from prolonged 'hidden hunger' under the military-backed interim government and the gravity of the sufferings of the disadvantaged groups like fishers can be guessed easily (source: The daily Samokal, <http://www.shamokal.com/details.php?nid=93426>, April 2, 2008).

land-based production system, homestead based small-scale vegetable and livestock production and other alternative sources of income are extremely limited.

This section will examine the aspects of livelihood diversification which fishers undertake as a mechanism to spread the risks and uncertainty inherent in small-scale fishery. Livelihood diversification is the process by which 'rural households construct an increasingly diverse portfolio of activities and assets in order to survive and improve their standard of living' (Ellis 2000:15). Eikeland (1999: *cited in* Salmi 2005:23) introduces the concept of '*rural pluriactivity*' which he defines as 'gaining an income from more than one economic activity'. Such diversification activities are intended as mechanisms for coping, adaptation and accumulation, meaning there are differences between livelihood diversification of poor who are struggling to survive, and that of better-off households that are diversifying to mount up more capital for future (*Ibid*: 23-24).

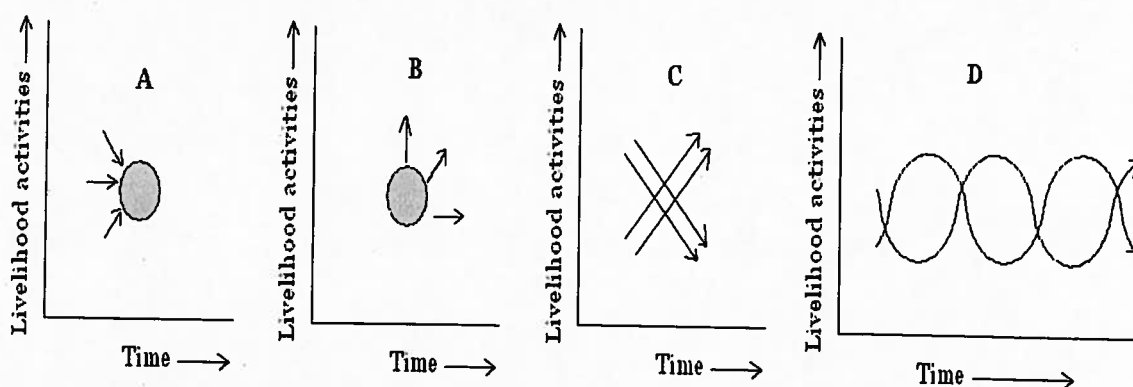
Fishers' livelihood diversification can be hypothesized from a temporal and experiential point of view. For peasants, Shanin in 'Awkward Class' (1972:74) put forward that '*a complex multi-dimensional mobility, involving both 'centripetal and centrifugal' tendencies simultaneously operating among peasant households is, therefore, at work and underlies the gross differentiation process in peasant society*'. This hypothesis will be used as a basis of my explanation of the livelihood diversity (Figure 6.6) of fishers.

**a. Notion of centripetality:** Historically, caste-based Hindu fishers revealed '*centripetality*' towards their profession. Because of the lack of skill in other similar professions and a birth-ascribed occupational affinity, caste-based fishers tend to remain in fishing-related professions. This notion of '*centripetality*' is also true for many fishers for whom small-scale fishing is literally like a mouse-trap from which the exit is difficult though the entry is relatively easier (Figure 6.6A).

**b. Notion of centrifugality:** On the other hand, the Muslim floodplain fishers revealed '*centrifugality*' in their professions (Figure 6.6B). Being privileged by the availability of farming land in the vicinity of the fishing village (both upland and seasonal inundated drawdown areas), a relatively higher level of socio-political freedom and networks, subsistence fishers have the opportunity to earn from agriculture also.

*c. Notion of multi-tasking:* A section of the fishers in all the villages behaves smartly to pool more resources through multi-directional mobility adopting strategies like seasonal migration and migration for remittance earning. Up to a certain level of age and physical condition, multi-tasking is bearable. Such multi-tasking is highly physically demanding and stressful for some fishers (Figure 6.6C).

*d. Notion of cyclical mobility:* Through the process of experience gained from multiple livelihood activities and based on the opportunities, fishers would make a trade-off between major livelihood activities in the form of cyclical mobility (Figure 6.6D). The cyclical mobility model tends to conceal class differences that exists in a fishantry, but in real life conditions, some biases like the number of active earning members, number of women and old persons, inheritance of wealth, family partition, fisheries resource availability and price, political power, desire for social dignity and macro-economic issues would impact the proposed picture of professional diversity.



**Figure 6.6:** Proposition A: 'Birth-ascribed profession and occupation of the last resort' B. As opportunities surround, fishers diversify their incomes from multiple sources, C. Multi-directional professional mobility to maximize earnings, and D. The trade-off between fishing and non-fishing activities as cyclical mobility of livelihood activities (modified from Shanin 1972).

Efforts for livelihood diversification follow a continuum of causes and stimulus that vary across families at a particular point in time, and for the identical families at different points in time (Ellis, 1998: 7, cited in Carswell 2002). It is more important for a marginalized section of the communities who are victims of the processes of deagrarianization and defisherization. Empirical qualitative evidence from the fishing villages reveal that fishers face increasing challenges over time in general and might be even more intense in future given the current situation of macro-economic development.

However, this is not to mean there is a possibility of 'defisherization'; such diversities may simultaneously function and co-exist in a community, and the local demography would allow the entry of new sets of an unskilled labor force into the profession so long as the production system allows subsistence functions.

Diversification, in my opinion, under certain context is a rational and desperate response to livelihood crises. Though livelihood diversification is an attempt primarily for 'economic diversification', the analysis of how fishers' attempts for economic diversifications are successful (or a failure) hints to the analysis of their capabilities and access to other capitals. Within the very limited scope of livelihood diversification, fishers keep trying to maintain or maximize earnings. Such diversification strategies are again impacted by seasonality, one's experience, physical condition and social capital. I will mention two interesting cases which are reflective of the wise adjustment of inhabitants with the floodplain dynamism.

Interestingly, though the first case sounds reflective of seasonal migration or 'transhumance' (Keesing 1981), it is more a form of 'transcattle', where cattle, pastoralist and cattle-owners get mutual benefits from the change in physical environment. Historically, pastoralism represents an off-shoot of the early mixed agriculture and herding complexes in adaptation to the dry grasslands, especially in the 'old world' (*ibid* 137). Cattle farming and their numbers are central to the economy of not only agricultural families, but also for many rural households as a means of a safety net.

#### **Case 1:**

His name is Nurul Islam; his life orients with seasonality; he is a fisher in the monsoons and a cow rancher (*bathanee*) in the dry seasons. *"During winter, there are hardly any grass covers left in the hilly area. There is a serious scarcity of fodder; the owners have no alternative left than to send the cattle at the downstream areas; as the uplands ('Kandis') wake up following the receding water, there is plenty of new grass. This new grass is very useful for the health of milking cows."* says Nurul. Cows are from plain land, semi-hilly and hilly areas. He charges Taka100 (US 1= Taka 65)/month for oxen and pregnant cows for their maintenance. There is no charge for the milking cows as he earns money through selling milk. The animals are brought for four months- *Poush, Magh, Falgun and Chaitra* (mid-December to mid-April). The number of cows varies from 70 to 700 in the ranching areas of the *haor*. Nurul doesn't have any notebook or diary for keeping accounts of the cows and associated financial transactions. *'Everything is in head, there is no document.'* he adds proudly.

The cows graze freely in the ranching area; there is a small shed for the milking cows and calves; Nurul also lives in one corner of the shed; his wife brings meals from the village. There is no tubewell; Nurul and his cows drink polluted channel water. He doesn't care about cleanliness and the smelly environment. Around 20% of the animals are milking cows (1-1.5

L/cow/day); members of the 'Ghosh' (Hindu caste-based milk/sweets producers and sellers) come to buy milk from Nurul; the price is around US\$ 0.25/L. His income ranges between US\$ 350-850 (Taka 20,000 to 50,000 for the dry season) based on the number of cows. He has a child laborer to assist him. He knows indigenous techniques of livestock management. *'I know that grass develops in four days; that is why I divide the whole area into four segments and try to rotate the herd cyclically'*. As the water starts entering the *haor*; he returns the cows from the ranching area with no mistake of identity. He gets ready for subsistence fishing with a small lift net for the rest of the year with different sets of clients.

It is not known when such an adaptive management of cattle started in the Hakaluki *haor* area; the aged pastoralists of the *haor* in other ranching areas mentioned that such a management system has been for a half-century. There is no formal network for collective identity among these pastoralists, but they keep themselves updated about different stories through the milk sellers. This case clearly demonstrated that at least some households with enhanced social networks and different sets of knowledge can interplay with changing sets of ecological characteristics<sup>35</sup>. It also shows that ecological adaptations in the *haor* seasonally shape the interrelations between social groups and their economic lives.

#### Case 2:

This case reveals how fishers make the best use of the wet season as part of livelihood diversity. The interviewed person has a very good network with GO-NGO officials and entrepreneurship ability.

'Sabbir is an influential young leader. He has 235 ducks of his own; he does duck ranching on a small piece of upland; he encloses the land with torn fishing nets and constructs a small house (L-7m, W-7m, H-2m) with bamboo fence to protect the ducks against attacks of foxes and wild cats. He does not buy small ducks; he purchases juveniles to rear them quickly in a limited time. He provides some supplementary feed during '*Ashar-Srabhan-Bhadra*' (mid-June to mid-September). Around 20 kilograms of unhusked rice and 10 kilograms of rice bran are given everyday. He calls the male and female fowls '*haoa*' and '*aai*' respectively. Sabbir keeps a proportion of 5% male and 95% female. He gets 160-180 eggs each day.

*'The low level of water is the harbinger of diseases for the duck'*- Sabbir mentions. Duck plague and cholera are quite common; he consults a government livestock officer for the selection of right medicine. He faces problems from the poachers and illegal hunters of

<sup>35</sup> From literature, we get a similar picture of cow ranching known as *habbanae* in rural Cameroon which is based on social reciprocity. The *habbanae* is the loan of an animal (e.g., a heifer) from a herdsman to another. The receiver keeps the animal for a given period of time throughout which he can hold it in usufruct (e.g., a heifer's milk and calves). Afterward, the animal is returned to the provider, who may then enjoy a new *habbanae* in return (Bonfiglioli, 1988, Dupire, 1996). This system of gift giving—based on *habbanae* as a common norm of reciprocity—is a device for herdsmen to build and maintain social relationships and, incidentally, to protect themselves from exposure to natural disasters (dryness, epizootics, etc.) by dispersing part of their herds and asking members of their network for help in the event of need (cited in Ballet et al. 2007).

migratory birds. He filed complaints against the poacher to the local chairman for compensation but in vain. He has to maintain security in the ranching area round the clock. His wife and little son take care of the duck when he goes outside. Sabbir earns around Taka 8000-15,000/month (US\$ 125-230) for a period of 4 months. He knows that duck litter is very important in maintaining a higher productivity of the beel water. He does not know whether migratory birds carry viruses for his ducks or vice versa. The fowls roam in the beel during daytime and in the evening they come back to the shelter at night'. Once the business of ducks is over, Sabbir starts growing vegetables. This is how he makes the best use of his upland area.

Poor people are forced to look for avenues as their livelihoods become seriously threatened. The Bengali word '*dhaandha*' indicates desperate efforts of poor for enhancing income from whatever sources possible. Diversification of livelihood opportunities is extremely important for the 'persistence of subsistence', as familial incomes are seasonally affected by a host of factors. For fishers, sniffing around for earning from more than one source during the period of unemployment or disguised unemployment is critical for reducing the stresses of food insecurity. There are scholars who believe that if income sources from the wider economy increase, then individuals would leave fishing profession (Allison and Ellis 2001). I argue that such a generalization might not be applicable for all groups of fishers. There are caste-based fishers who adhere to fishing largely due to socio-religious obligations, typical psychological attitudes, a gambling nature with the seasonality of fishery, lack of skill for alternative activities, geographical remoteness<sup>36</sup>, political powerlessness and lack of endowments that repeatedly tend to keep them dependent on a single profession. One Hindu fisherman comments:

*'I am a caste-based fisherman; fish curse on us before death; fish can reach heaven if/when touched by 'Jaladas' fishers. I have to wait for resurrection for obtaining purity for changing caste and profession. It is God who decides what creatures will do, what I can do as a creature!'* Sunil Jaladas, 48, Thakurtala.

Sunil will wait for resurrection to change his birth-ascribed profession. While the caste-based affiliation is still strong in the Hindu fishing village, it is mainly the relatively higher income from low cost fishing operations that keeps Muslim fishers attached to fishing in the floodplain areas. For both these categories of fishers, centripetality of the fishing profession holds true.

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<sup>36</sup> I view the remote fishing villages as a 'control zone' opposed to urban centric development. Very little has been done to build up physical infrastructures in most of the fishing villages in Bangladesh.

The livelihood system is complex and it has variations at the individual, household and community levels. Accordingly, fishers employ their asset base, networks and experience accumulated over time to develop workable livelihood strategies. Table 6.12 provides a picture on the distribution of households' efforts for enhancing incomes from multiple sources. It is evident that 68.44% and 49.08% of the male-headed households are engaged in active fishing in the coastal and floodplain fishing village respectively. While 6.88% of coastal respondents remain engaged in daily fishing in the nearby coast and estuaries throughout the seasons, around 10% of floodplain village respondents remain engaged in fishing in perennial and deep water bodies in negotiation with the leaseholders. Considering the ancillary activities along with active fishing, around 84% and 55% of male headed households in the coastal and floodplain villages respectively make their livelihoods directly from fisheries.

It was mentioned in section 5.6 of Chapter Five that access to and availability of natural resources from the ecosystem play a significant role for the women-headed households, especially in the floodplains. Small groups of fishermen are found to take up some other jobs like terrestrial farming, daily labor, hair dressing, rural transportation, etc. on temporary or permanent bases. Women in both the villages did not exhibit any participation in some activities like rural transportation, carpentry, hair dressing and remittance earning. Begging was taken up as a means of survival by a few destitute fishers in the coastal village.

For all these categories of people, my propositions of centrifugality and multi-tasking holds true. Among the alternative sources of income other than fishing, there are professions which require substantial time for getting a full return (like terrestrial farming, cow and duck ranching). A small section of fishers remain engaged usually in two professions like fishing and cow ranching, fishing and duck rearing, and fishing and farming. The nature of the secondary profession is such that engagement in the third category of activities is usually difficult. For these categories of fishers, the notion of cyclical mobility holds true. These categories of fishers acquire substantial expertise in the alternative profession also.

**Table 6.12: Combination of livelihood sources for male and female-headed households (expressed in %) as part of livelihood earnings (multiple options allowed for respondents)**

Types of profession	Primary earning source				Secondary earning source			
	Coastal		Floodplain		Coastal		Floodplain	
	M	F	M	F	M	F	M	F
Active fishing* <sup>1</sup>	68.44	-	49.08	-	6.77	-	9.43	-
Fish retailing/processing	5.27	29.42	1.88	-	3.76	7.53	-	-
Shrimp fry catching /selling	3.76	5.88	-	-	4.51	9.76	-	-
Lending boats and gear/ beel subleasing (floodplain)	3.76	-	3.77	-	-	-	-	-
Net weaving & repairing	5.27	29.42	-	14.28	9.54	5.41	3.77	2.50
Boat repairing/painting	1.5	-	-	-	4.50	-	3.77	-
Terrestrial agriculture* <sup>2</sup>	0.75	5.88	5.67	14.28	3.0	3.76	12.64	2.50
Daily labor* <sup>3</sup>	2.25	17.64	11.30	14.28	12.78	17.53	15.85	12.86
Carpenter	1.50	-	3.77	-	-	-	-	-
Rural transportation* <sup>4</sup>	1.50	-	5.67	-	3.76	-	3.77	-
Foreign remittance	-	-	1.88	-	-	-	-	-
Small business/tea stall	-	-	3.77	-	-	-	-	-
Tailoring	-	1.50	-	-	-	-	-	-
Barber	0.75	-	-	-	-	-	-	-
Seasonal ranching* <sup>5</sup>	-	-	3.77	-	-	-	-	-
Homestead poultry/livestock	0.75	5.88	-	14.28	2.83	9.76	7.55	37.14
Natural resource gathering* <sup>6</sup>	-	1.50	5.67	28.58	2.83	3.76	9.43	22.85
Service	0.75	-	1.88	-	-	-	-	-
Begging	1.50	3.00	-	-	-	-	-	-
Other* <sup>7</sup>	2.25	-	1.88	14.28	3.76	13.65	7.55	4.28

*Source: Field survey 2005*

\*<sup>1</sup> Active fishing (steerer, asst. steerer, head laborer, labors, mechanic engaged in daily- weekly-season round fishing boats) inclusive of long-term, seasonal or subsistence fishing.

\*<sup>2</sup> Includes basically sharecropping and daily labor in paddy fields/smallscale nursery

\*<sup>3</sup> Includes daily labor in salt production fields, betel leaf and nuts garden, shrimp ponds, fish drying yards, tea stalls, mud cutting etc.

\*<sup>4</sup> Working as driver/puller of rickshaw, van, and small three-wheeler ('baby taxi')

\*<sup>5</sup> Seasonal ranching of cows and ducks locally known as 'bathan'

\*<sup>6</sup> Gathering of earthworms, frogs, fodders, vegetables and woods

\*<sup>7</sup> Others include masonry, healers, singers, house tutors, packaging, maid servant, custard selling, etc.

Family members ranging from 2-4 individuals (even 5 in one family in the floodplain village) were engaged in earning activities whatever the amount is, in the case of 70% and 57% households of coastal and floodplain village respectively. Each member was found to earn from 1-3 activities with an average of two in most cases. However, the cases of multi-tasking and gear specialization<sup>37</sup> was found extremely limited in both fishing villages.

<sup>37</sup> Floodplain fishers have adapted well to the banned mono-filament 'current nets' given their low price, poor regulatory measures and easy availability in the market. Similarly owners of larger marine set bag nets (MSBN) convert their nets to suit in the shallow coastal waters during bad weather periods through further reducing mesh sizes at the cod end.

Members of about 2% of the floodplain fishing families managed to migrate as laborers to the Middle East earlier this decade. Divakarannair (2007:140), from his study of the coastal Muslim fishers of the Ponnani area, Kerala, India, showed that 6% of household heads migrated to Middle Eastern countries for diversification of income for livelihoods; it is claimed that the process of emigration has become increasingly difficult for the poor and less educated members of the fishing communities. However, none was reported to emigrate from the coastal study village of Thakurtala. I observed that remittance money in the greater Sylhet region (northwestern part of Bangladesh) did not succeed in uplifting the rural agricultural and fisheries enterprises, if viewed from a rural welfare point of view. Migrants' remittance currently provides valuable financial resources to many developing countries including Bangladesh. Bangladesh annually receives an official remittance worth US\$ 3.8 billion (Breun 2006), most of which are from the Middle East countries. Remittance flows are second only to direct foreign investment and are significantly larger than official development assistance in a number of developing countries (Ratha 2003, Bagasao 2004: 1; *Migrant Remittances*, 2004a, cited from Khan and Yeoh 2006). Money is known to be transacted through an informal and clandestine '*hundi*' system. Fishers did not disclose the amount received as remittance earnings for security reasons.

Families of the remittance earners were able to create a social position and political space for themselves. It was noted that the impact of remittance money at the household level is significant. The money is usually used for the repayment of costs incurred for migration, consumption, housing, land purchase and health care, while it simultaneously creates a dependency syndrome among family members and starts challenging the existing social and cultural institutions. There is no conclusive evidence of the impact of remittance money on income redistribution at the rural level. Remittance money in some instances appeared counter-productive. Here is a case of the influence of remittance earnings from a neighboring floodplain village:

*'Do you know how this 'Nurul Chairman' (leaseholder of the 'Padma beel') manages to get lease as the highest bidder? ....He 'manages' the government officers and police with...the thing is that he is connected to 'money tree based at London'; his brothers have restaurant business in London and they send him money... with the dollar (fishers use the term 'dollar' to mean all currencies irrespective of countries), he can buy everything he wants...we struggle for earning little money from the haor,*

*whereas he fights with the fishers for displaying power and earning more using his remittance money'* (excerpts from interview with Mamtaj Ali, 56, Volarkandi).

The overall health of the ecosystem and catch directly or indirectly affects the earning of the female-headed households; around 59% of them depend on gathering natural resources as their main source of income. Terrestrial agriculture ensures earnings for around 23% and 29% of the male- and female-headed households in the floodplain village<sup>38</sup> which is more than double that of the coastal village. This is reflective of the importance of the availability of arable land, which is extremely limited in the coast. Only 56% of the male-headed coastal household heads managed to gather secondary jobs while others are left with unemployment or underemployment leading to the eventual debt trap; the scope of earnings from secondary occupations is higher in floodplain areas. Interestingly, female-headed households in the coast and floodplain village are in a better position of earnings through multi-tasking and compromising with a low wage rate compared to that given to men for similar manual jobs. However, this situation also reveals an entry of unskilled labor force in the farm/non-farm activities. The recent trend of fishing in leased beels is a big concern both in terms of labor utility and sustainability. A 50 acre beel with multiple sets of '*katha*' (fish aggregation devices) and medium water level usually require a man-power size of 40 fishers for around 3 days; while the same beel can be fully dried up and totally harvested with one-fourth labor requirement using diesel-operated pump machines for the same duration. The former process is ecosystem-friendly while the latter is deadly for the wetlands.

There is a difference in the trend of diversification among different wealth category groups. My observation is that poor households rely more on income sources which are physically demanding, while the higher medium and rich classes use their networks for maximizing earnings. Remittance earning is almost impossible without strong financial backup and networks at home or abroad. Diversification of livelihood activities is closely

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<sup>38</sup> The earnings for the agriculture laborers vary dramatically based on the 'crop productivity' and the 'risk of incoming flood water'. If the crop is too good, the laborer usually gets 10-15% of the crop; in the case of medium crop productivity, the proportion will go up to 25-30%; in case floodwater starts approaching, the crop share rises up to 50%. When landlords find that harvesting paddy will not be profitable at all (inundated by flood water), the paddy field is abandoned. Anybody from the surrounding village can harvest stems of paddy. Such harvesting is called '*Noyonjoli*' (literally the owner helplessly sheds tears to see the condition of paddy). This evidence shows that private property can turn to common property in the advent of natural disasters, which is at times good for the poor.

connected to the growth of agriculture or non-agriculture-based labor-absorptive small and medium enterprises in the rural areas. Due to the lack of poor macro-level support and inputs needed (like electricity, security, political stability, good governance, loans on easy terms, market outlets), labor-absorbing small and medium enterprises are yet to flourish in rural Bangladesh. Large-scale disasters impose a process of defisherization and subsistence crisis; fishers can not go out for fishing if they lose boats and gear. The roles and efficient functions of macro-institutions are very critical in such contexts.

#### **6.4. Discussion**

This chapter revealed that poverty is not only a product or manifestation of material deprivation, but it is intimately linked to a set of multiple socio-economic, political and cultural factors. As Seeley (2006) rightly mentioned poor people face series of things that make them descend into poverty ('drivers of descent') and they have very limited options to move up out of poverty ('drivers of ascent'). For the fishantry at any point of time, livelihood functions are directly or indirectly impacted by the available opportunities, households' endowments and entitlements, macro-and-meso-institutional issues, and the stresses and hazards they face. Analysis of the vulnerabilities reveals that fishers are exposed to sets of vulnerabilities, which emanate from complex ecological, socio-political and economic domains. The analysis makes it clear that the degree to which poor fishers suffer from different stresses and calamities is determined by the frequency of abnormal incidents and on their capability of self-protection against those negating factors. It is almost certainly the case that sustaining livelihood well-being requires classic skill to manage relationships and transactions in different spheres, making the best use of what can be achieved through one sphere, and then going together with more well-orchestrated actions in the other spheres (Bebbington 1999).

This means that graduation from poverty requires not only enough income to move to a better economic status, but also the means to defend against negative forces of downward mobility so households can remain at that improved level (Rahman 2002). It is evident that Thakurtala being a land-scarce village, drawing additional income from agricultural activities is extremely limited except for scanty household level gardening. They are mostly dependent on the harvesting from the coastal areas, and the dwindling

nature of catches followed by the seasonality aspects of fishing keep them arrested in the poverty cycle. Cross-scale institutions are not in favor of fishantry, and there is the strong likelihood that the disparities within the sector would continue to increase until and unless serious attention and political commitments are geared towards the poor fishers.

Poverty not only leads directly to illness in numerous ways, it also leads to frustration and hopelessness culminating to poor livelihood resilience and illbeing. When individual households face critical stages in their livelihoods, especially in bad seasons of income, they seek supports and favor from their kin and communities immediately. When a sense of hopelessness prevails among the majority of households, then the people are in dire need of a process to revive their hopes and aspirations. It is apparent that the fishing households cope with adversities by adopting multiple livelihoods, in compliance to the opportunities and capabilities they have, constraints they face, and the changing social relations dictated by external and internal forces. However, the opportunities of multi-tasking are very limited in the study areas. Households' ability to ensure livelihood security over time is an outcome of a complex nexus of factors such as composition of the families, sex ratio and number of earners/dependents, endowment sets, socio-political linkages, biophysical settings, macro-level economic processes and political forces (Hesselberg and Yaro 2006). Based on Oshaug's (1985) classification<sup>39</sup> of food security situation, it can be concluded that the majority of the fishers of Thakurtala village are fragile households, and there are limited numbers of enduring and resilient households. In both villages, many households are forced to dwindle between their resilient status in the good seasons and fragile status in the bad seasons.

It has been axiomatic in this chapter that within a typical pattern of mutual dependence in the coastal areas, it is the moneylenders and boat owners who usually approve the existing social and economic organizations, and the common fishers have nothing to do other than comply with the existing social order. Specifically, the economic institutions are not in favor of the poor fishers. NGOs, though active in the study villages,

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<sup>39</sup> Oshaug (1985) classifies households into three types: enduring, resilient and fragile. Enduring households are those that are able to maintain household food security on a continuous basis; resilient households suffer shocks but recover quickly, and fragile households become increasingly insecure in response to numerous shocks.

have not been able to make a change in meeting the financial needs of the fishing operations. In the case of Hindu fishing village, the trend of exploitation is exacerbated by the fact there has been a transformation in the ethnic composition and power structure in the artisanal fisheries sector that often tends to keep the caste-based fishers powerless, helpless and docile in a 'hostile rural socio-political environment'.

Sen observed that while the majority of the population of Bengal experienced nominal (or no) hardship over the 'great Bengal famine period of 1943-44), some vulnerable groups, such as landless laborers, rural artisans and fisher people, lost sufficient market command over food and lacked adequate alternative access (Sen 1981: Chapter Six). Half a decade after Sen's observation, there has not been a significant change in the food security condition of these classes of people. Acute food deficits and a kind of hidden hunger or pseudo-famine is persistently prevalent for a sheer majority of people in the fishing villages. Obviously, the existence of such prolonged hunger has long-term implications. Dasgupta (1997) aptly mentions that there are differences between the economics involved with under-nutrition and that of famine. Famines are usually regarded as disequilibrium phenomena as they can not persist for the reason that their victims do not survive; in contrast, even a widespread incidence of undernourishment can persist indefinitely (*cited in* Mukherjee 2004: 52). Some complex situations of food insecurity in sub-Saharan Africa reveal that a 'political dimension' is important; often victims are politically powerless and their food entitlements are determined by their lack of rights and political muscles within the wider institutions, and there are powerful groups who create a failure in entitlement for others in order to increase their own endowments (Keen 1994).

Attaining a higher level of livelihood resilience is important for a low-income natural resource-dependent community like fishers. It has been revealed that fishers adopt a wide array of coping strategies as they face crises. Policy-makers of the country need to pay due attention to the various sets of these endogenous strategies for developing locally appropriate crisis management interventions. Campbell et al. (1991:74) aptly comment, '*that they are not unusual actions taken in time of stress, but are integral components of the rural production system, components which assume greater importance in periods of*

*difficulty*'. Each household, based on its capitals and capabilities, has an intangible line of coping threshold. As the coping threshold limits of households are crossed-over by multiple sets of stresses, the households become extremely vulnerable and continue to experience serious livelihood struggle including starvation.

For the sake of livelihoods, households have to make choices involving complex negotiations and difficult trade-offs among a host of social, economic and ecological attributes, and drawing equilibrium between the competing values is fundamental for building livelihood resilience in a complex globalized world (Armitage and Johnson 2006, Jentoft and Chuenpagdee 2009). The incidence of persistent poverty and inadequate living standards in many resource-dependent regions suggest that most livelihood systems are not resilient to change, and episodic events and chronic economic, social and /or ecological challenges at multiple scales can often trigger a return to unsustainable livelihood systems and increased poverty (Armitage and Tam 2007). When the assets of a livelihood system are depleted and institutions are unable to adapt to change, available livelihood strategies become 'brittle'- resulting in reduced resilience- and vulnerability to disturbance increases (Glavovic et al. 2002).

It is quite usual that small-scale fishers with a very limited asset base and capability tend to gravitate towards greater vulnerability and lower livelihood resilience. In the contexts of social-ecological uncertainty, household strategies to develop capacity to adapt to change and gradually build on resilience to deal with changes are critical (Berkes et al. 2005). There is no denial of the fact that human well-being and the livelihood system, specially of the poor, primarily depend on the sustained provision of environmental goods and services; hence attempts for maintaining ecological resilience comprising ecological integrity and biological diversity is fundamental (Glavovic et al. 2002). Based on field research and long interactions with the experienced respondents, it can be lucidly commented that the livelihood resilience of the fishing communities is at stake and this observation holds especially true for the coastal caste-based fishers. In the background of a worldwide signal of fisheries resource decline (FAO 2002) and recent trends in climatic and human-induced stresses, it may be said the situation of poverty in the artisanal fishing villages might be aggravated if appropriate types of resource governance are not adopted.

There is no denying the fact that fishery management strategies of the country impact heavily upon the livelihood well-being of the fishers. An unregulated and uncontrolled fishery (as we see the symptoms in the case of the coastal fishery) has multiple ripple effects on the fishers, especially those who depend solely on fishing. The management aspects of small-scale fishery in Bangladesh will be analyzed in the next chapter.

## **Chapter Seven: Fishery Management and Policy Perspectives in Bangladesh**

### **7.1. Introduction**

Previous chapters dealt with livelihood endowments, capabilities, vulnerabilities and resource management issues from the perspective of the fishing households and communities of inland and coastal ecosystems. It was argued that without long-term efforts and commitments for creating political and legal entitlements for the fishing communities and their traditional institutions, it would be difficult for the majority of the fishers to ensure livelihood well-being. Particularly for the inland fisheries sector, fishers' livelihoods and well-being have intimate connections with the policy and legal instruments. To cite an example of how fisheries policy impacts the poor fishers' livelihoods, the leasing and licensing of productive wetlands deserve attention. As the property rights are handed over to powerful non-fisher elites through the leasing or licensing process of the government, the genuine fishers can be evicted overnight from the wetlands where they fished for generations. Such changes in policy forced the shifting and disappearance of resources from the poor to the elites, and the demise of a highly developed indigenous knowledge of fisheries management systems in many areas.

This chapter will examine the roles of formal and informal fisheries institutions, followed by an analysis of the evolution and effectiveness of the legal and policy instruments relating to fisheries management in Bangladesh, and then focus on a locally crafted informal institution. The line of argument is that given the present strength and efficiency of human resources on the Department of Fisheries (DoF) and allied ministries of the Government of Bangladesh, there is a critical need to actively involve fishers and other relevant stakeholders in the management of the fisheries. Also, as and wherever applicable, local efforts to manage fisheries should be encouraged and recognized within the legal framework.

### **7.2. Fisheries institutions in Bangladesh**

The existence and proper functioning of appropriate institutions is critical to the process of fisheries management. The term 'institution' is often inadequately and loosely defined in contemporary fisheries literature; it may include a framework of rules (both formal national legal frameworks and locally-constituted informal norms and processes) which

define the interrelationships between the stakeholders and resources, and also the organizations which often define, work within and implement policies relating to these arrangements. For a particular society, institutional capacity building reflects on the endogenous process through which it changes its rules, institutions and standards of behaviour of the community members, increases its level of social capital and enhances its capability to respond/adapt to changing situations (World Bank 2003). An understanding of the interplay and pattern of connectedness between higher level and local level institutions is very important. Berkes (2000) argues that higher level institutions can have both negative impacts (through centralization of decision-making, shifts in systems of knowledge, colonization, nationalization of resources, increased participation in markets, etc.) and positive impacts (through state legitimization of local institutions, enabling legislation, decolonization and revitalization, capacity-building and institution-building) on the local and community-level institutions.

An institutional approach emphasizes that besides the biological and economic parameters of fisheries management, there are wide ranging institutional arrangements (including legislative frameworks, policy instruments, mechanisms of participation and decision-making, information collection and analysis) which impact fisheries positively or negatively. Berkes (2000) argues that natural resource management in many parts of the world is centric, and the adoption of monolithic science-based management approach eventually swept away a rich diversity of local practice and knowledge base. There are many instances from Southeast Asia and elsewhere which show how informal institutions contribute towards participatory management of fisheries resources (Pomeroy and Viswanathan 2003).

The critical need for accountable and transparent governance overshadows all other institutional issues in Bangladesh. Similarly the fisheries sector of the country is characterized by complex institutional and governance issues. Over the past decades, various linkages and reforms have been tried upon but the examples of successful implementation are extremely limited, and institutional complexities continue to prevail (Muir 2003). If a livelihood approach for the fishers is applied, the role of dozens of ministries and departments (concerned with health, education, social welfare, agriculture, local government, etc.) would come to the forefront, but this discussion will be limited to

fisheries institutions only. At the central ministry level, the institutions primarily concerned with fisheries and other natural resource management are: Ministry of Fisheries and Livestock (MoFL), Ministry of Land (MoL), Ministry of Water Resources, Ministry of Agriculture, Ministry of Environment and Forest (MoEF), and Ministry of Local Government and Rural Development. Among all these ministries, the MoL plays a very influential role in retaining control and leasing various government-owned waterbodies (*Jalmohal*).

There are a few autonomous and informal fisheries institutions in the country which have differential involvements, especially in the fisheries project implementation. The constitution of Bangladesh specifically mentions about the rights of workers/laborers to unite and function as a bargaining agency. In the discussion of fishantry, I mentioned the informal institutions of fishers are yet to be horizontally linked and gain sufficient political strength to bargain for their interests and well-being. Table 7.1 provides a brief view of the Strengths, Weaknesses, Opportunities and Threats (SWOT) of formal and informal institutions operating in the fisheries sector.

The primary objective of the MoL is to collect revenue from land and waterbodies, and not necessarily the sustainable management of the resources therein. Under the Forestry Act 1927, the MoEF regulates fisheries activities in the *Sunderban* mangrove area which is widely known as the most important spawn and nursery areas for hundreds of brackishwater and marine species. As the frontier wing of MoFL, the DoF has the mandate of transfer of technology, conservation of fisheries resources, quality control of fish products, administering fisheries projects, policy advice to government, catch monitoring, poverty alleviation through fisheries activities and socio-economic upliftment of fishing communities. DoF's capacity to enforce regulatory measures is handicapped due to its perpetual dependence on police and local administration for logistic and legal supports. The research wing Bangladesh Fisheries Research Institute (BFRI) focuses more on basic and applied research for fish culture, and there is a clear lack of multi-disciplinary approaches to address important technical needs of the sector.

**Table 7.1: SWOT analysis of the fisheries institutions of Bangladesh**

Strengths	Weaknesses
<p><i>Formal institutions:</i> Well-trained and educated technical staff; significant capacity of fisheries extension and research; wide-ranging policies and legislations.</p> <p><i>Informal institutions:</i> Highly capable think-tank institutions and NGOs; caste-based organizations embedded in local socio-culture; rigid leadership.</p>	<p><i>Formal institutions:</i> Poor capacity of governance; low motivation of personnel; inter-ministry and inter-department power hierarchy; project-fed and poor revenue budgetary allocation; little coordination and coherence; imbalance on focus between inland and marine fisheries; little capacity of working directly with communities; strong revenue orientation rather than sustainable management orientation.</p> <p><i>Informal institutions:</i> Limited influence in framing policy and legal instruments; no legal recognition; little or no cross-scale communication and coordination.</p>
Opportunities	Threats
<p><i>Formal institutions:</i> Ample scope to expand fisheries activities; democratic political regimes; revision of focus based on existing realities and needs; increasing recognized roles of fisheries in national economy and employment.</p> <p><i>Informal institutions:</i> Flexibility in operation; wider local acceptance; highly participatory; moral and financial supports from donors and international organizations; decentralization policy of the government.</p>	<p><i>Formal institutions:</i> Donor bureaucracy and pressures; highly politicalized personnel management; shift of attention and priorities in future due to global warming and other natural hazards.</p> <p><i>Informal institutions:</i> No legal recognition; some activities subject to scrutiny and approval from local administration; professional divergence might lead to inertia of local organizations; demographic pressures, social exclusion and political powerlessness.</p>

*Source: Workshop with DoF officials, NGOs and fishers, Cox's Bazar, August 2006*

A limited number of NGOs (BRAC, Proshika, CODEC, CNRS, BASTOB, Mukti, Grameen Bank, Coast Trust) are involved with capacity development and socio-economic upliftment programs for fishing communities. The leadership of the National Fishermen's Association (NFA) is captured by non-fisher elites and hardly represents the interests of the genuine fishers. As per Memorandum of Understanding (MoU) signed between donors and the government, the allied agencies are expected to carry out the development activities in line with the lessons of the projects, but such post-project activities and monitoring become seriously handicapped by the limitation of resources and motivation. The project-led Community Based Organizations (CBOs) become mostly dysfunctional and fragmented following withdrawal of project supports. However, caste-

based informal organizations of fishers continue to survive in the coastal fishing villages. A brief treatment on these organizations is provided under section 7.4 of this chapter.

The MoL is mostly responsible for the overall control of water resources. Small waterbodies are also controlled by the Department of Forests, Bangladesh Water Development Board, Bangladesh Railway, Roads and Highways, and the Ministry of Youth and Sports. All these different departments and ministries possess different development objectives and employ various approaches which often do not fit with the interest of fishers, fisheries resource management and conservation. While the donors and NGOs tend to focus more on the fishing communities as their primary objects of development, the government machinery tends to focus more on revenue generation ignoring the basic aspects of sustainable fisheries management. DoF staff has limited or no exposure to the process of capacity development and empowerment of fishing communities, and this role generally falls under the manifesto of NGOs. However, a serious limitation of NGO involvement in the fisheries projects is that, following the departure of the NGOs at the end of fisheries development projects, the community-based organizations usually become inert and fragmented. Empirical observations reveal it is the experienced and dedicated staff of the NGOs that matters a lot in the formation and functioning of the community organizations, rather than the big brand name NGOs.

In the past, donor communities and international organizations strongly influenced the institutional reform and sectoral planning capacity of the fisheries department and other relevant agencies in Bangladesh. Most of the donor-supported projects had a focus on quick tangible outputs in the areas of aquaculture, with little attention paid towards long-term functioning of the fisheries institutions and the empowerment of the fishing communities. An overall poor governance environment of the country along with numerous political crises impacted the spirit of institutional reform. The idea of the incremental development of the institutional capacity in line with the needs of the fisheries sector is hard to realize, and in tandem with the projectized operational base of DoF, makes the evolution of an effective and cohesive institution difficult (Muir 2003: 29). DoF has made remarkable progress in the extension of culture-based fisheries. However, most of the aquaculture activities are now controlled and managed by private sector entrepreneurs. DoF's performance in the open water inland

fishery and coastal small-scale fishery is debated due to poor budgetary allocation, legal constraints and institutional inefficiency. Now it is time for DoF to be actively involved in fisheries management, taking the strength and support of the existing informal fisheries institutions and simultaneously enhancing effective coordination with other departments and ministries.

I will now examine the situations of the project-led CBOs in the floodplain study village. All became dysfunctional after the project period, although the socially-rooted institutions like 'mosque committee' and 'village panchayet' keep functioning for decades. Even within the project period, two small beels legally leased to Volarkandi fishers through the efforts of CNRS and CBFM-2 project were sub-leased to outsiders by two influential committee members of the CBO. They argued that the two beels are not very productive and they wanted to get rid of those sanctioned waterbodies. The '*Volarkandi Matshyajibi Samobay Samitee*' (village cooperative) was established and registered in 1972 with 80 members. The cooperative used to take lease of larger waterbodies like '*Chatla, Pinna, Naguar, Katua and Kukurdubi*' from the government; they had a regular savings program and profit allocation among them. Catching fish was an annual activity, and all the villagers used to get fish. The cooperative, however, mainly due to some internal leadership conflict, has been dysfunctional for the last 15 years. There are NGO-led cooperatives (like '*Samajvittik Volarkandi Bahumukhi Samabay Samittee*', formed under the CBFM-2 in 2003 with 20 members and a 27-member CWBMP Committee, formed under the CWBM project in June 2006) and micro-credit groups that are largely inert and play inconsequential role in village level functions and politics. Interestingly, a women-led '*Mahila Jubo Samobay Samittee*' was established in 1998 purposively for leasing out '*Chirua beel*' and '*Katijouri beel*', which became inert in 2 years as the waterbodies were taken over for management by their male counterparts

There is anguish against the leadership of CBOs among the general members. One member (Salam, 40, Volarkandi) commented: '*the central leaders of project-led CBOs are like honey-bees; money is honey to them; where there is money, you will see these honey-bees around. They know well how to convince the officials and serve their own interests.*' Some members are not even aware of the basic objectives of the CBOs and some join there for serving other purposes (like accessing micro-credit on easy

terms). The level of motivation is poor; familial conflicts among members negatively impact the activities of the CBOs and there is hardly any conflict mitigation mechanism.

### **7.3. Fisheries management approaches in Bangladesh: Policy perspectives**

*'The government is like a hand with so many fingers, a very big hand and a very long hand. The hand is full of laws. The hand can catch anybody or save anybody it wants. The hand always moves around the powerless poor people, and favors the rich powerful section' - Binoy Jaladas, 49, Moheskhali.*

While 'Rice and fish make a Bengali', and the government's efforts to increase rice production are appreciable, the fisheries remain as an apparently less appreciated sector to the government planners. The existence of multiple objectives (employment, nutrition supply, foreign exchange earning, resource conservation, socio-economic upliftment) of DoF makes fisheries management extremely complicated. In Bangladesh, fisheries development policies are characterized by predominantly top-down, expansionist, productionist and technology-led approaches, and the contents of the policy favor the priorities of powerful elite groups at the expense of the rural poor (Muir 2003).

There is a clear dominance of technical approaches to fisheries management in the country; however, there is an increasing recognition of the role of multi-level institutions in fisheries management. It is widely perceived that Western science-based fisheries management approaches in a complicated geo-physical situation and multi-species fishery are seemingly ineffective. There is a growing consensus among many fisheries researchers and managers of Southeast Asia that solutions to many of the current fisheries management problems lie outside its traditional realm (Pomeroy and Viswanathan 2003). Siltation, pollution from multiple sources, demographic pressure, non-compliance of fisheries legislations, and change in the ecosystem following flood control measures are some of the important threats for conservation of fisheries resources. In the process of flood control, drainage and irrigation, the ecological and hydrological systems of floodplains have been drastically altered throughout the country. The transformation has caused a number of significant changes for flora and fauna through reducing living space of many floodplain resident species, restricting their life cycles and production of many important fishes, which together negatively impact the livelihoods of many fishers

(excerpts of 'Focus Group Discussion' at Baralekha, May 2006). Here I will discuss the transformation in fisheries management approaches from a historical perspective.

**Colonial and pre-independence regimes:** In Bangladesh, the legal framework for the management of fisheries developed from two different legal regimes– i. Doctrine of Public Trust of the ancient Roman Empire in which the government held certain common properties such as rivers and seashore in trusteeship for the free and unimpeded use of the general public, and ii. English Common Law in which the sovereign could own these resources but could not grant these to private owners, if the effect was to interfere with public interest in navigation or fishing (Kabir and Hassan 2007). Prior to the pre-colonial regime (before 1757), fisheries management has been the *de facto* responsibility of fishers as user community, and historical records show hardly any symptoms of unsustainability. The enactment of the 'Permanent Settlement Act 1793' and the 'Bengal Act II of 1889' by colonial rulers empowered '*Jaminders*' (landlords) to exercise control over the land and '*Jalmohal*' (waterbody) with a view to maximize rent generation from the users. But with the enactment of 'The East Bengal State Acquisition and Tenancy Act (EBSTA)' in 1950, the *Zamindari* system was abolished and the properties were nested with the Ministry of Land, meaning the state itself replaced the role of *Zaminders* (Ahmed et al. 1997). In the same year, the Fish Conservation Act was promulgated mainly to restrict the use of destructive gear and save brooders and juveniles.

**Post-independence regime:** Following independence of the country in 1971, no urgent steps to manage the waterbodies could be taken during the war-torn situation. During 1950-65, anyone capable was able to get a lease for the *Jalmohals* (waterbody), but such open-ended leases were targeted towards genuine fishers since 1974. The waterbodies were leased out for 1-3 years in an auction system to powerful non-fishers, who happened to be the highest bidders, and have been generally successful in keeping the poor genuine fishers under their grip. In the process of leasing, several layers of intermediaries are created and the actual fishers are subject to 'rack renting' and a dependency relationship for their fishing rights, who can no longer eke out a decent living from fishing alone. Also, innumerable amount of litigations centre around waterbody management and leases (Siddiqui 1989) due to conflict of interests and power-play between present and potential

leaseholders. With increased layers of intermediaries, it is always the fishers who become deprived of their due rights and shares.

In 1980, the government transferred all '*jalmohals*' from the Ministry of Land (MoL) to the Ministry of Fisheries and Livestock (MOFL) for management of fisheries resources under DoF. DoF continued traditional leasing and looked for alternative management policies emphasizing biological principles. Under the Local Government Ordinance 1983, administration of *jalmohals* under 8 ha became the responsibility of the 'upazilla (sub-district) administration' for revenue earning. In 1986, the Government of Bangladesh introduced its 'New Fisheries Management Policy' (NFMP), which was considered to be in favor of fishers ('*Jal jar, tola tar*'- He who holds the nets owns the waterbody) with the objective to free the fishing people from exploitation by intermediaries, leaseholders and financiers; to redirect major benefits of fisheries to genuine fishers; and to ensure the conservation and propagation of fisheries resources (Ahmed et al. 1997). Fisheries management in the floodplain areas of Bangladesh can not be performed by the lead Ministry alone. Only 257 waterbodies out of 12,000 (around 2% of the total) were handed over to DoF for licensing (Muir 2003)<sup>1</sup>. Reportedly, DoF technical experts do not receive sufficient cooperation and support from the dominant MoL, and the ownership of the waterbodies by the MoL restricts the ability of DoF to manage and conserve fisheries resources therein. Under the present system of bureaucracy, the MoL holds much more administrative power and authority compared to that of MoFL and DoF; field level officials of MoL are apparently uncompromising with their historic traditions of land and waterbody management.

In 1991, an auction process was replaced by sealed bids, which was 'black and white' meant for and restricted to 'genuine fishers'. Bids had to be 25% higher than previous lease value. After calling for bids four times, the barrier of 25% enhancement can be relieved by the administration committee. Poor and illiterate fishers fail to comply with all these legal and administrative procedures themselves without institutional supports, and the non-fisher elites take advantages of the legal loopholes using their

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<sup>1</sup> The actual number of wetlands is unknown. A press release of the ministerial body of the government recently claimed that there are 28,879 wetlands of various sizes in the country (source: [www.bdnews.com](http://www.bdnews.com), May 18, 2009).

political networks and power. In my consideration, the leasing process of the commons property is a major departure from the spirit of the Tenancy Act that prohibited excessive landholding authority of the *Zaminders*. The elite leaseholders appear as new *Zaminders* or water lords through the scrupulous leasing process. One government officer comments from his experience:

*'Apparently the bidding process is nice, but it is full of loopholes. The powerful elites and political cadres with connection to local administration and police can easily manage lists of fake fishers in their favor for bidding process. They are backed by local members of the parliament and ministers. Genuine fishers are helpless in such situations of competitive bidding; rather than becoming owner of the jalmohals, they render themselves as 'subservient' to the bidders. The non-fisher leaseholders don't comply with any of the conservation principles. Altogether leasing is a highly chaotic process and a power and money game'* (Dilip K. Saha, Upazilla Fishery Officer, Baralekha; June 2006).

In 1995, all rivers and open waterbodies were declared open access and community-based management projects with support from donors/NGOs initiated. In 1998, the 'National Fisheries Policy' (NFP) was introduced and shaped by explicit or implicit narratives of revenue generation<sup>2</sup>, production enhancement, environmental management, production, poverty alleviation and community involvement in fisheries management. It is argued that NFP provides a platform for DoF to improve its national profile and seek for the national budget to carry on the institutional obligation for sustainable fishery development. The DoF has seemingly initiated a process of transformation from its erstwhile 'producing role' to a 'promoting role' with changes in some key institutional issues that constrain the sustainable development of the sector and effective linkages with other important stakeholders including local governments and fishing communities (Muir 2003).

The policy, legal structures and international agreements that broadly impact fishers' welfare are also varied<sup>3</sup>. There is a poor coordination at cross-scale institutions

<sup>2</sup> My analysis on the lease value of some productive wetlands of Hakaluki haor revealed that, in less than two decades, the lease value has increased 10-250 times, which is simply not affordable for the genuine poor fishers. The actual cost is even higher than the officially mentioned values. Obviously, the fisheries resource from those wetlands did not increase correspondingly.

<sup>3</sup> Some of the legal instruments are: the National Fisheries Policy 1995, the National Environment Policy 1992, the National Environment Management Action Plan (NEMAP) 1995, the National Water Policy 1999, the National Conservation Strategy, the Coastal Zone Policy 2005, the Marine Fisheries Ordinance

ranging from the local to the national level. Also, there are numerous conflicts of interests across agencies. One top-ranking bureaucrat of the government admits:

*'although functional considerations justify that overall management of jalmahals lie with the Ministry of Lands, technical experts from MoFL must be accorded their due role in the management of jalamohals...this is not going to be an easy task in an administration de veiled by inter-departmental jealousies, tendency for empire-building for financial and power corruption, lack of unified and integrated approach etc.'* (Siddiqui 1989:76).

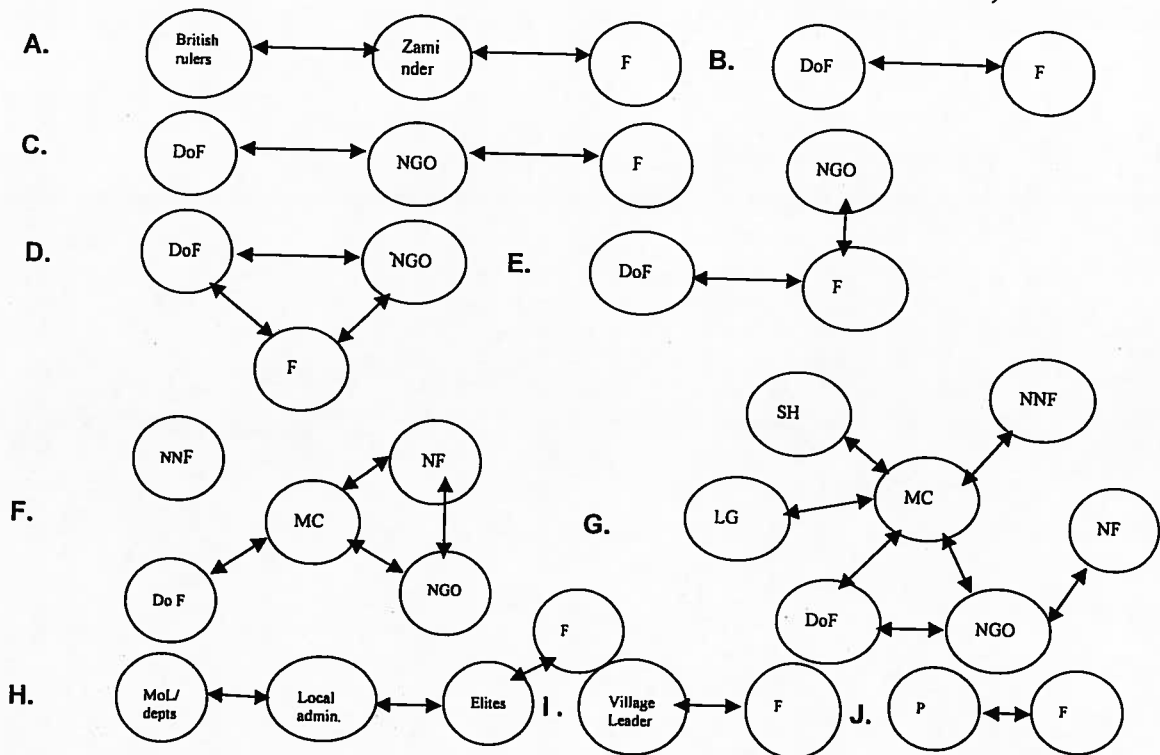
***Institutional partnership and Community Based Fisheries Management (CBFM) initiatives:*** In Bangladesh we get a picture of experience of partnership models (Figure 7.1) for the inland water fisheries from the works of Ahmed et al. 1997, Toufique 1998, Berkes 2002, and Thompson et al. 2003. Ahmed et al. (1997) identified three broad categories of co-management arrangements in Bangladesh: i. NGO-led strategy (fishery leased to NGOs or its groups); ii. government-led strategy (government licenses fishers or leases to a fisher cooperative); and iii. government and NGO partnership (support from government and NGOs either through licensing or a community-based or group approach). Institutional structures began to change since the 1980s following donor-supported CBFM (Community Based Fisheries Management) projects in some selected inland areas of the country.

The key features of the action project included capacity building and empowerment of fishing communities through the involvement of DoF and NGOs, securing access rights of fishers to waterbodies, the formation and functioning of local management committees, and access to credit (Thompson et al. 2003). Ahmed et al. (2008), from their survey in the Hakaluki *haor*, concluded there is evidence that the possession of management rights may increase incentives to invest in resource improvements. I had quite the opposite observations. Empirical observations in the Volarkandi and Pabijuri fishing villages of Baralekha upazilla revealed that actual property rights and management activities were confined to a few influential committee

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1983, the Marine Fisheries Rules 1983 amended in 1993, the Territorial Water and Maritime Zones Act 1974, the Coast Guard Act 1994, the Protection and Conservation of Fish Act 1950, the Protection and Conservation of Fish Rules 1985, the Fisheries Development Corporation Act 1973, the Fish and Fish Products (Inspection and Quality Control) Ordinance 1983, the Bangladesh Environment Conservation Act 2004, the United Nations Convention on Law of the Sea (UNCLOS), the Conservation of Biological Diversity and the Code of Conduct for Responsible Fishery (CCRF).

members of the CBOs, and the overall impact of the development projects in the wetland areas have not proved sufficient and satisfactory in bringing out any desired change in the fishers' welfare (Excerpts of FGD with fishers of Volarkandi, June 25, 2006).



**Legends:** MC: Management Committee, DoF: Department of Fisheries, NGO: Non-government organization, NNF: Non-NGO Fishers, NF: NGO organized fishers, SH: Stakeholders, F: Fishers, LG: Local government, P: Paddy farmers.

**Fig. 7.1:** Models of interactions between DoF, fishers, NGOs and those developed under co-management programs of ICLARM (Models A-G adapted from Ahmed et al. 1997, Berkes 2002, Thompson et al. 2003). Situations revealed in 'H' arise in cases where several layers of intermediaries exist; situation 'I' represents traditional forms of territorial management and situation 'J' represents a new arrangement between paddy farmers and fishers in the seasonal waterbodies of greater Comilla district. Farmers temporarily lease out waterbodies to fishers for seasonal fish culture.

There are certainly short-term gains in habitat restoration and enhancement in productivity in some wetlands. The involvement of fishers should go far beyond the co-opt function to meaningful participation, making fishers aware of their rights and responsibilities, engagement in policy dialogue, and encouraging collaborative partnerships with the sharing of decision-making power. The CBFM project would have benefited them immensely if they could consider the potential values of the indigenous knowledge of the experienced floodplain fishers in developing local resource

management plan, rather than depending solely on the experts' knowledge from DoF and WorldFish Centre.

The leaseholders of small beels are not properly oriented about their rights, responsibilities and limitations. In many cases, the management practices of the leaseholders (including the fishers) are not conducive to the principles of resource conservation and sustainable development. The leaseholders employ all-out efforts (draining of water, drying of wetlands, massive fishing using destructive gear, etc.) to ensure the total catch from the waterbodies as the tenure of the lease draws close to an end. This is attributed to the fact that the leaseholders do not have any long-term commitments towards the sustainable resource management, rather than making quick profits out of the wetlands. There are opposite views about involvement of leaseholders. It is argued that in an imperfect legal environment, the ability of elites to exercise power would be eventually beneficial to the poor also (Toufique 1997).

Although the official validity of the Memorandum of Understanding (MoU) signed between the Ministry of Land, the WorldFish Center and the NGOs for CBFM projects came to an end in 2007, the community groups shall continue managing the waterbodies in the CBFM model up to 2011. Co-management arrangements are not grounded in any form of legislation. The fate of the leaseholders under CBFM-2 project after the stipulated period is not known. Kabir and Hassan (2007) mentioned that the leaseholders of the fishing communities would face setbacks due to the lack of long-term commitment to management practices like CBFM, unclear demarcation of water bodies, cancellation of CBFM lease arrangements by local administration, delayed handing over of possession of waterbodies due to suits filed by previous leaseholders, absence of executive order (gazette notification) giving legality to the CBFM agreements, high lease values, and lack of institutional support and legal recognition of the fish sanctuary. In Bangladesh, though the leasing system is intended to offer legal rights to genuine fishers, existing rules and regulations do not explicitly recognize the common property use rights of fishing communities. Based on field observations, it can be safely remarked that, as long as the land administration of the government takes on a higher rent-seeking strategy, the genuine fishers will be deprived of their fishing rights in the wetlands.

Creating a supportive policy environment for the poor fishers requires harmonization of policies across sectors, especially land and fisheries policy areas. In Bangladesh fisheries sector, although the growth of a partnership between DoF and NGOs is slow, a general acceptance of their complementary roles has emerged (Thompson et al. 2003). Fishers are not generally aware of the contexts of fisheries policy, but the most common interpretation is they are ignored and their opinions are hardly valued by the government. One leader of the fishers' comments:

*'Sincere commitments are lacking. Most of the government officers want to throw sticks on us. They don't have real respect for us. Fishers, as socially relegated groups, consider themselves honored if they are simply invited for participation in meetings and workshops, knowing that their opinions will never be considered. They are happy with small snacks ... we have to walk a long way for changes in attitudes'* - Udvab Jaladas (President, Cox's Bazar Fishermen Welfare Foundation).

**Governance of marine fisheries:** Within the Department of Fisheries, the marine fisheries wing including the artisanal fishery remains a relegated one. A preliminary assessment of human power shows that the inland sector has >30 times more manpower compared to the marine sector, though the administrative area under the inland sector is smaller compared to the marine sector. The allocation of resources is <5% for the marine sector compared to the inland fisheries sector. The government planners keep allowing more industrial trawlers in the sea through joint ventures, though the bases of such decisions are not known to fishers and other stakeholders. Coastal artisanal fishers strongly perceive that the trawlers keep seizing fish and shrimps illegally in the shallow territorial waters, and such reckless activities have tremendous negative impacts on the catches of the artisanal fishers and the long-term sustainability of the resources.

The Marine Fisheries Ordinance 1983 was promulgated for marine resource management, but unfortunately, the small-scale fishery is largely unregulated and uncontrolled. The ordinance does not recognize the roles of fishers as a professional class; rather it focuses heavily on the mechanized sector. Marine fisheries officials claim that, since the independence of the country in 1971, the fisheries wing never drew serious attention of the government planners. It is only the UNDP/FAO pilot project-ECFC (2000-2005) that 'significantly' contributed towards organization and capacity building,

alternative income generation and community participation in coastal resource management using the 'truly' participatory model in 117 fishing villages of Cox's Bazar.

I mentioned earlier in the section 4.2.4 of Chapter Four that marine fisheries expanded in an uncontrolled and unregulated way in the last three decades. The official status of the present level of standing and harvestable stock is not known. The *emic* view of fishers bears witness of a serious decline in their catches, both in terms of quality and quantity. Simultaneously, genuine fishers have lost control over important fishing territories they used to control for generations. A management plan for the marine sector is yet to be developed, so far. Small-scale fishers of the Cox's Bazar region voiced their key demands in a workshop, which I consider pertinent to formulate a change in the existing situation:

- a. The territorial water spanning from shore to at least 5km should be declared as an exclusive fishing zone for non-mechanized boats, and up to 10 km for the boats with small horse-powered boats with 5-20 HP engines. The existing rule that prevents trawlers to operate below 40-m depth zone should be enforced.
- b. The government should expand the surveillance actions of navy and coast guard to save fishers from pirates, to monitor the basic life-saving appliances in all the fishing boats, and to enforce a ban during the no-take period declared by the government.
- c. Stern actions should be taken against the users of destructive gear, like synthetic monofilament net- '*current jaal*', small-meshed beach seine- '*ber jaal*', encircling gear '*char jaal*' and push nets rampantly used for collection of shrimp fry. Similarly, the catching of excessive 'mother shrimp' by shrimp trawlers should be restricted. The number of industrial trawlers should be reduced immediately.
- d. A separate fisheries bank (note: there is a national bank exclusively for the farmers, named 'Bangladesh Krishi Bank-BKB') for farmers, or at least special wing of BKB should be launched to save fishers from rural moneylenders.
- e. Stop the entry of new fishers and take steps to enhance alternative and appropriate income generation opportunities in the fishing villages.

f. Steps for extensive community-based mangrove plantations along the coastal belt should be undertaken for resource conservation and the safety of the coastal villages from cyclones. Pollution from multiple land-based sources should be abated.

g. Government should encourage the participation of genuine fishers for devolving management plans and enforcement activities; the existing local institutions should be legally recognized, and support centres for the artisanal fishers should be opened in all the 47 coastal sub-districts.

*(Source: Workshop with artisanal fishers of Moheskhali, August 2006, Upazilla auditorium)*

In Bangladesh, it is observed that centric hard line measures sometimes work well, at least from a biological point of view, despite their immediate negative impacts on the fishers' livelihoods. In the face of massive destruction of *Hilsa* fish at juvenile stages (*Jatka*, juveniles of *Tenualosa ilisha* and *T. Toli*), the central government took some good measures in some riverine nursery areas by banning fishing during the spawning period (March 1 to April 30) and providing some support (extremely insignificant, <US\$ 0.8/day/fishing family) to the enlisted affected fishers. Such steps have proven positive in enhancing *Hilsa* production in the country. Despite all the legal niceties, the registered fishermen cooperatives are completely dominated by non-fishermen traders, the richest section of the fishing communities and the political activists (usually of the ruling party) at the apex and other federating levels (Siddiqui 1989: 78). As a result, fishers' institutions suffer from lack of entitlements, powerlessness and detachment. Down to the roots, the situation aggravates due to the Malthusian pressure of a growing population on the limited resource base.

Having discussed the policy and legal issues impacting the fisheries, I will now concentrate on how the coastal artisanal caste-based fishers, although small in number, continue to adapt locally crafted rules for managing territorial waters and fisheries.

#### **7.4. 'Faar': Locally crafted institution for fishing territory management**

The 'Community Based Natural Resource Management' (CBNRM) approach originates from two main directions: a positive position considering the capability of communities to manage common property resources on which they depend on (Wade 1987, Ostrom 1990), and the search for institutional alternatives to costly and often failing top-down

management regimes (Johannes 2002, Ellis and Allison 2004, Berkes 2008). Mixed in with these two major approaches are a host of subsidiary arguments concerning participation of user communities for taking control of their own development destiny in the face of manifest weaknesses of central authority to do so (Blaikie 2004).

Most importantly, CBNRM as an approach enjoys greater social acceptance through balancing social equity; it is a people-centered, empowering, flexible, least costly and socio-culturally embedded organic approach that inherently embodies a process of social learning through the social memories and experiences. As a political and development process, it creates at least some political entitlements for the relatively 'voiceless and unheard' poor users. Putting values to CBNRM is also an acknowledgement that the local ecological knowledge of user communities holds practical significance for local level resource management, and acknowledges 'different gardens, different blossoms'- local communities have acceptable local solutions for different situation-specific problems.

In the academic literature, CBNRM has exhibited a cycle comprising 'initial enthusiasm (Western and Wright 1994), followed by critical analysis (Agrawal and Gibson 1999, Leach et al. 1999, Kellert et al. 2000), followed in turn by empirical evidence of substantive failures in practice (Campbell et al. 2001, Kumar 2002). A critical examination of the management dynamics in a certain location obviously requires an appreciation that institutions governing access to natural resources are sites of local interactions, negotiation, co-operations and contestations. However, at the centre of the literature lies 'the false notion of community as a homogenous group of people with a single identity of interest' (Agrawal and Gibson 1999, Allison 2004, *cited in* Ellis and Allison 2004: 18).

The link between communities and natural resource management has been generally viewed positively; it is assumed that given some adjustments and negotiations, communities are the ideal units to devolve control over natural resources (Baumann 2002: 7). There are many cases that reveal that local-level institutions learn and develop the capacity to respond to environmental feedbacks faster than do centralized agencies (Berkes and Folke 1998). While it is usually understood that communities are not

necessarily homogenous in the context of distribution of societal power and hierarchy, it is considered that such inequalities do not always undermine the cementing ability of the community, and hence, the conditions under which the poor can manage resources are locally embedded and socially constructed. Obviously, local or community-level institutions alone cannot carry out or replace the functions of regional or national institutions (Berkes 2000).

Common property theory suggests that without proper support and cooperation of the primary resource users and other key stakeholders, proper resource management is difficult. Coastal communities that demonstrated remarkable capabilities to maintain property rights through their locally-crafted rules, norms and networks of reciprocity, the resilience of the ecological system has been well-maintained (Berkes and Folke 1998). A remarkable synthesis on the accomplishments and challenges of fisheries co-management is provided by Wilson et al (2003). Such institutions tend to prevent open access conditions to other competing groups, thus playing positive roles towards fisheries resource conservation and sustainable uses.

This section examines the locally crafted diverse territorial management institutions, locally known as '*faar*', that are evidenced since 1929 in the traditional fishing villages. '*Faar*' can be viewed as a socially recognized, enforceable and exclusive hereditary right; it is the holder's competence and capacity to hold and transfer it. The word '*faar*' has connotations for both the management system and local fishing grounds controlled by the communities, and '*pata*' means one's specific area for setting nets irrespective of a time limit. '*Faar*' as an age-old management institution for granting fishing entitlements to pertinent members through rotating fishing sites manifests the capability and harmonious management of local institutions. There are similar traditional institutions in Southeast Asian countries (a comparative analysis presented in Table 7.2). These are broadly caste-specific, and limited to the operations of ESBN/MSBNs (Estuarine and marine set bag nets) and rarely gill nets. I learned about '*faar*' from the purposively selected fishing villages of Cox's Bazar and Chittagong coast.

The entitlement is usually temporary in nature though some fishers in '*Selimpur*' fishing village, Chittagong district enjoy '*faar*' for generations, and the resource use

rights in such a case are transferable and saleable. The '*faar*' administered by the village leadership of '*Maijghona*' is spread over the river '*Buramatamuhuri*' which fall under the 'land administration points' 1085 and 1087 (*Buramatamuhuri*), 1093 (*Ichaphari*), 1094 (*Takkofari*), 1104 (*Jalaissa*) and 1119 (*Maachkata*). There are 56 fishing locations spread over around 15 km long areas of the '*Buramatamuhuri*' river, of which the *Maijghona* fishers still manage 40 locations. These hereditary Hindu fishers lack a legally recognized arrangement with the local administration, and hence their age-old institution faces enormous pressures from the competing Muslims fishers of nearby villages. Interestingly, the '*faar*' has become synonymous with the conical-shaped net ESNB/MSBN (locally called '*behundi*' jal) in the southeast coastal part of Bangladesh, as is the case for '*Padu*' with stake nets (Lobe 2002). There are sharp variations in '*faar*' administration, and the decisions are taken independently by the traditional village leaders '*Sarder*'. Here are some instances:

1. In the case of '*Maijghona*' fishing village, for temporary control over 40 '*faar*', there are 70 candidate households. 'Lottery system' is organized by the village leader and his associates on a pre-declared date prior to the advent of the spring tide ('*Jo*'). Forty small tokens with numbers 1-40 and 30 tokens with zero are used for 70 fishers. The winners of the numbers 1-5 enjoy freedom to choose their desired locations sequentially. Those drawing the number zero will not get access to any '*faar*', but can set nets in less important locations outside the designated areas. In some instances, those who win 'best locations' hire nets from others who failed to win the lottery. In this way, at least a minimum income is ensured for other fishers.
2. In case of '*Tarasghata*' fishing village, a locally devised raffle-draw is arranged among villagers on the evening of the tenth lunar day of every fortnight for deciding temporary ownership of 25 '*faar*' (among 4 families) controlled by the village. In some years, when there is a need for money for management of the village council, they call for an auction of 5-7 best locations. The highest bidders (auction money for each site varying from US\$ 90-120) are allocated the sites, and the remaining fishing sites are allocated among other fishers fortnightly. In

two metallic pots, the names of villagers and '*faar*' are kept. The village leader or a child picks a name and '*pata*' simultaneously. Nobody questions the integrity of the system; those deprived still set their nets outside the regulated areas. Fishers keep separate route for navigation and the 'swimming of buffalo'.

3. In the case of '*Boalkhali Jaladaspara*', '*faar*' are allocated to pertinent members during the religious festival '*durga puja*' (usually in September-October) for the whole year at a cost of US\$ 15-50 per '*faar*' depending on the strategic location. In all the cases, money is used for religious ceremonies and legal battles for control over the '*faar*' when they face challenge from the competing Muslim fishers.

4. In case of the '*Sunderbans*' fishing zones in the southwest, there are some areas where '*faar*' are controlled by some fishers for years. However, they shift quickly when they find better catches somewhere else. The general tendency is to target the mouth opening of the channels as these areas are usually considered to be rich in both mature and immature fish and shell-fishes.

Beyond these arrangements, there are some *de facto* arrangements among the fishers. Mechanized boat owners with multiple sets of ESN/MSBNs maintain certain alignments ('*pata*') for setting 5-7 nets. These '*pata*' are not usually marked by flags or any visible items; however, some bamboo sets are seen in the nearby coastal areas. No matter whether there are visible marks/signposts or not, the fishers can recognize areas as the '*pata*' of certain fisherman. The fishers can enjoy the '*faar*' from one fortnight to generations, depending on the local arrangements and decisions. The distance between adjacent nets varies from 2m in the channel to even 30m in the near-shore areas (Figure 7.2). The distance between two tapering ends of a net is usually 64m; the mouth opening varies from 14m (ESN) to 24m (MSBN) and the distance of rope varies between 20-25m. Participatory observations revealed there are different combinations in net setting; such as side-by-side ('*pasha pashi*'); parallel ('*somantoral*'), back-to-back ('*pichoney*'), Y-shaped and zigzag ('*terra becka*') (Figure 7.2). As it is evident from the operational arrangements of nets in the estuary and shallow sea, the net-setting combinations (except the straight-line position 'a' that added to sedimentation problems) allow certain portions

of the fish to escape through the gaps and distances maintained between gears. The local wisdom in setting nets is perceived to contribute towards conservation and sustainable use of resources.

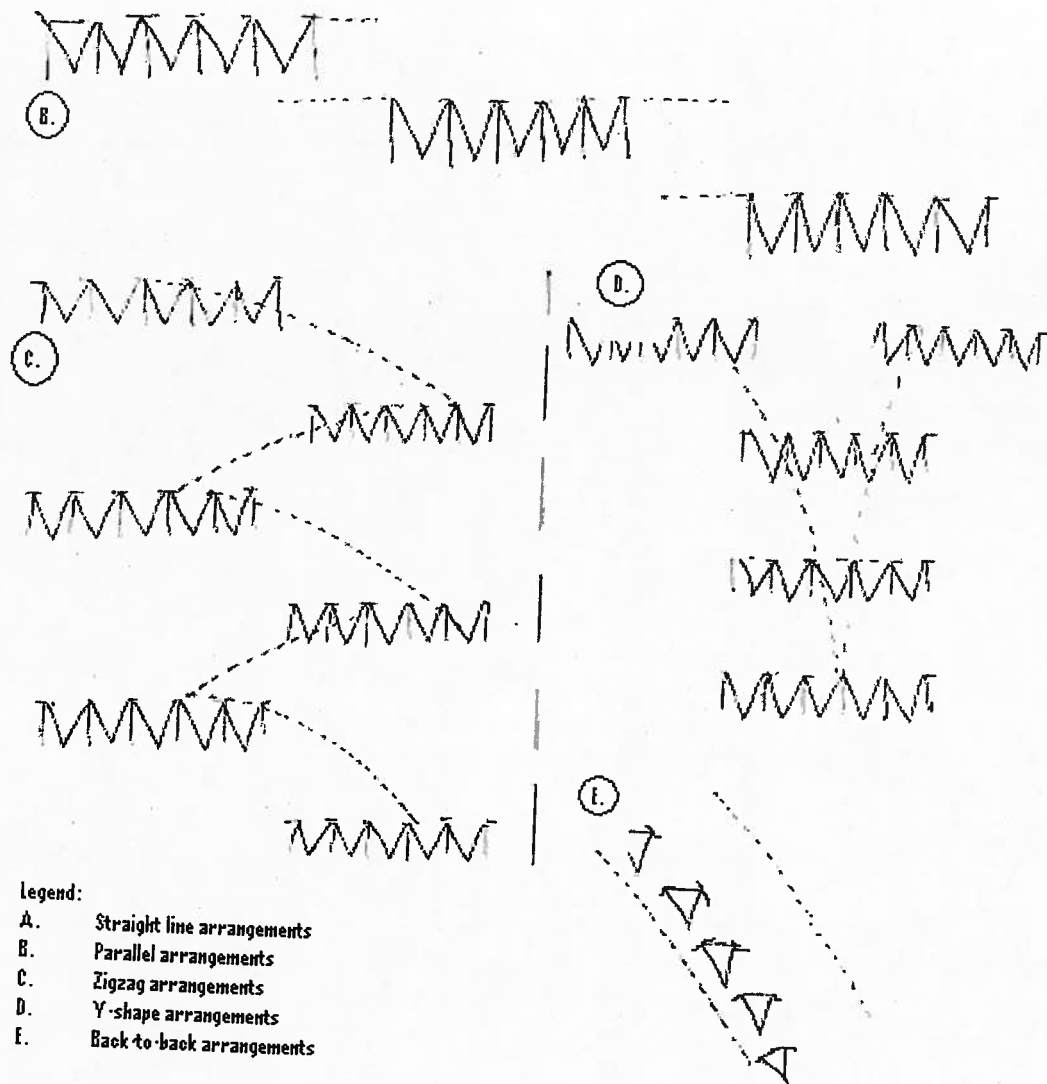


Figure 7.2.: The traditional '*faar*' setting in the coast

Table 7.2 : Comparison of community-based institutions prevalent in Southeast Asia

Features	Pulicat lake, Tamil Nadu, India	Negombo estuary, Sri Lanka	Kerala- Cochin estuary, India	South-east coastal belt of Bangladesh
Property rights arrangement	'Padu' shared by three villages	Four Rural Fisheries Societies (RFS) share the access to the fishing grounds	Three 'Sangams' (society or association) allocate access to fishing grounds	'Faar' primarily a village based institution; however inter-village arrangements are also evident
Caste specificity	All fishers are members of the traditional fishing caste- 'pattanavar', represented by both Christians and Hindus	All fishers are from the same group of Roman Catholic identity	All fishers are Hindu and members of the same caste 'Dheevara'	Fishers belong to Hindu traditional fishing caste 'Jaladas' (literally 'slaves of water'). Prevalent among the Hindu 'Koibartadas' fishing caste also
Institutional basis of right holders	The sharing of the fishing grounds among the three villages is facilitated by their own caste organization 'Panchayet'	The Roman Catholic church facilitates the sharing of the fishing grounds between the four RFS; each then operates their lottery independently	Each fishing ground operates independently- there is no coordinating institution. Lottery is facilitated by individual 'Sangam'	The village based institution 'Sarder' (Village leader) and his associates determine the allocations. Inter-villages arrangements and conflicts are rarely negotiated by the council of the 'Sarders' with cooperation from local Union Parishad members and chairman or local administration
Geographical territories of fishing sites	Located close to the mouth of the estuary; fishing grounds again divided into 25 sites accommodating 56 nets	Close to the mouth of the estuary; two fishing grounds divided into 22 fishing spots accommodating around 70 nets	Close to the one of the mouths of the estuary; three main fishing sites sub-divided into 78 sites accommodating 78 nets	Usually close to the mouth of the sea; also prevalent along the shallow coastline far from the fishing village. Sub-division varies from village to village based to location and geographical coverage; nets covered vary from 40 to 100
Gear specificity	Stake net ('Suthu Valai')	Stake- seine net	Stake net ('Ooni Vala')	Mainly 'Behundi' - Estuarine Set Bag net (ESBN), also Marine Set Bag nets (MSBN) and Hilsa gill net
Catch composition	Primarily targets shrimp ( <i>Penaeus indicus</i> )	Shrimp- 82% are sub-adults of shrimps, of which 70% are <i>Metapenaeus dobsoni</i>	Targets mainly shrimps <i>M. dobsoni</i> , <i>M. monoceros</i> and <i>P. indicus</i> with seasonal variation	Targets a variety of species- mainly <i>Acetes japonicus</i> , <i>Mystus gulio</i> , <i>Lates calcarifer</i> , <i>Arius</i> spp., <i>Cynoglossus</i> spp., <i>Harpodon nehereus</i> , <i>Mugil</i> spp., <i>Liza subviridis</i> , <i>Valamugil speigleri</i> , <i>Eleutheronema tetradactylum</i> , <i>Setipinna taty</i> , <i>Trichurus savala</i> , <i>M. monoceros</i> , <i>M. brevicornis</i> , <i>P. indicus</i> , <i>P. merguiensis</i> , <i>Neptunus</i> spp., <i>Trichurus savala</i> etc. Size varies from larvae to adult with dominance of sub-adults
Duration of entitlement	Allocation granted on a daily basis within a monthly cycle of assigned days	Daily basis using a weekly cycle and a yearly lottery to assign starting points in the rotation	The three 'Sangams' operate independently; rotation takes place annually in the general meeting	In most of the cases, on a fortnightly basis; no daily or weekly allocation, so far. Yearly allocations are also evident. Some fishing sites in the Chittagong belt are 'marketable' and transferable through generations

Source: Modified from Mathew 1991, Panini 2001, Attapattu 1987, Amarasinghe 1997, cited in Lobe 2002.

'*Faar*', as a traditional caste-based system of granting fishing entitlement bears significant roles in building social capitals and solidarity among the user communities. Each time, the allocation holders get opportunities to transform their social networks. Specially, fishers who get long-term possession of the fishing locations, tend to revitalize their relationships with new businessmen and moneylenders. Such value-oriented social capital is important for community members, as many individuals use and maintain the capital as a refuse or safety net for coping in adversities. Summarizing the '*faar*', we see that: 1. it denotes a particular territory in the adjacent estuary or sea, 2. a microhabitat where fish aggregates and eventually appropriated, 3. a locally devised control and management system that is intimately connected to livelihood system of fishers, and 4. a socio-cultural value system.

### 7.5. Discussion

The idea of active participation of local resource users in the development and management of natural resources has been part of the development process in Southeast Asia since the 1960s (Pomeroy and Viswanathan 2003). A community-based approach to fishery management means taking account of the interdependencies between different livelihood strategies at the local level, and the differential impacts that sectoral policies have on them (Barr 2001:38). Some drivers and conditions for co-management, typically induced by conflicts between fishers (e.g., artisanal vs. industrial fishers; different users of crafts and gear within small-scale fishery), competition among the fishers for space and access to fish-abundant areas, and increasing number of new entrants (e.g., recent migrants to the coast) (Chuenpagdee and Jentoft 2007:660) already prevail in the country.

Strong political and institutional commitments are inevitable to recognize, incorporate and institutionalize the role of fishers and other stakeholders in the management of fisheries. The significance and roles of the informal and traditional institutions need to be valued properly. Cordell (2000) aptly mentions that sea tenure traditions are important not only for subsistence of fishers, but also for sustenance of cultural values that are related to the construction and maintenance of social identity and a sense of place for the communities. The fishery planners of the country must realize that effective fishery management is almost impossible in the long run in an institutional vacuum without the active support of fishers.

One issue is obvious from my field experience. In the pre-independence periods, the genuine fishers used to enjoy the waterbodies without much hurdles and competition. That socially ascribed right has been gradually taken up by a socially and economically powerful non-fisher elite group. Specially in the last decade, the leasing process has been over-politicized, and only elites with sound economic conditions backed by a strong political foothold from the ruling parties can get a lease and control the waterbodies. Most of the genuine fishers lack these much-needed 'forces' for leasing and controlling waterbodies.

There is a clear need to review and update the legal regimes to incorporate biodiversity and conservation principles implicitly into the legal framework. The critical issue at this juncture is to ensure greater long-term benefits for the fishers, resources and economies. It could be argued that as 'the pace of globalization grows ever faster and the spread of its influence runs ever deeper, the necessity of legislative reform for proper development is more vital' (Muir 2003:76). The level of changes that the existing government institutions undergoes to share power, authority, responsibility and information for managing the fisheries will be critical for participatory fisheries management (Pomeroy and Viswanathan 2003). The political process of policy formulation largely refuses to take into account the aspirations and participation of the common people, who might be impacted by the narratives of the policies. There is a clear need for policy coherence among the different sectors, tuned to the country's national policies and international commitments.

Finally, does the recognition of the fishantry bear extra impetus for them? It is difficult to make conclusive comments on that, and much more depends on the capacity of the fishers in raising their voices and the political commitments of the government. However, there are some positive learnings from the cases of peasantry in Bangladesh. Compared to other professional rural inhabitants, peasants in Bangladesh have been specially recognized and advantaged in the arenas of constitution, policies, legal institutions, facilities and budgetary allocations. There are specialized service sectors for facilitating means of agricultural productions, including special provisions of low-interest loans from the commercial state banks for the peasants. Accordingly, it is expected that recognition of fishantry by the government as specialized professional and social group would go a long way in terms of their socio-economic betterment and political empowerment.

## Chapter Eight: Conclusion

Before leaving the coastal fishing village after the completion of my field work, I visited most of the households to pay my tributes to the fishers for their cooperation and sharing their experiential knowledge. When, following the custom of the fishing community, I went to take leave of a well-respected fisher asking his blessings, he commented:

*'On your final day, I just want to say you something in short. You see, things are changing very rapidly. Human attitude towards Mother Nature is changing; what was a source of sacred values and resources once is now turned into a 'competition ground'; fishes are declining sharply; fishers don't hesitate to suck everything from the water for mere survival; for people like me, everyday is a new reality; ...a day-to-day fight for simple meals, a lifelong struggle against old poverty. The moment I walk outside my village, I will be subject to subjugation and exploitation by the powerful... we have no land to plough, no other sources of income; our expectations are very simple—just two meals a day and sound sleep in the night... we the hereditary 'Jaladas' fishers are in a serious existential crisis. If you come for a follow-up study after some years, I assure you, many of us might be evicted from this profession.'* Narayan Jaladas, 65, Thakurtala.

Narayan's final remarks are supportive of many of my important findings. There are experienced fishers like Narayan in the fishing villages who have witnessed the ups and downs in the artisanal fisheries and consequently in their livelihoods in the last four to five decades. Taking a comparative approach between two distinct communities representing two different ecosystems- floodplain wetlands and coastal/marine, this study critically examined their livelihood dynamics. From an anthropological point of view, coastal and floodplain study areas are represented by caste-based Hindu fishers and new entrant Muslim fishers respectively.

Scholars hold that 'the constellations of economic, social and moral structures and beliefs not only merely characterize each community, past and present, but in a vital sense help to determine their future as well' (Thompson et al. 1983: 6). Two domains of authority almost invariably exist in the fishing villages. The small but influential '*haves group*' comprise the engine-boat owners, leaseholders of wetlands, wholesalers and moneylenders having ample financial capital and political links with higher networks. On the other hand, the majority of the fishers fall under the category '*have nots*', whose very basic livelihoods are at jeopardy. The major focus of this research is on the latter group.

This research demonstrated that 'livelihood war', as introduced in Chapter One from the quote of a respondent, is not an assumed position, rather it is reflective of realities from the grassroots. This is not to say that small-scale fishers do not have the ability to come out of the vicious cycle of poverty at all. Despite a host of limitations, there are exceptionally few instances where a small group of fishers benefitted from numerous livelihood opportunities in and around the small-scale fisheries sector. For the great majority of the small-scale fishers, poverty and food insecurity is a major concern. Question arises: with the vast amount of traditional knowledge and cultural capitals that fishers have, should they be still considered as poor and vulnerable? The answer is 'Yes'.

Fishers' poverty is manifested in this research through their little holdings of financial and physical capitals. However, their strengths in terms of knowledge and cultural capital do not necessarily translate into capabilities for addressing day to day concerns for basic amenities. Fishantries, as a distinct social class, are subject to cross-scale stressors which they can not address concertedly; again most of them are incapable of coming out of the cocoon of the existing socio-institutional mechanisms and political disempowerment processes. A few instances would clarify the issue. A fisherman with his vast amount of knowledge on fisheries is and will remain poor and food insecure in material sense until and unless he finds a job on the sea-going boat of others (coastal fishery), or secures access to productive wetlands through leasing or sub-leasing (floodplain capture fishery). Fishers with vast social and institutional memories and knowledge on cyclone have little to do to save their lives and properties if they have no access to safe and secure cyclone shelters in the vicinity of their villages. Fishers in the Hakaluki haor can not solve the sedimentation problem that is rooted to deforestation and mining in the neighboring Meghalaya of India, unless serious efforts are undertaken through bilateral agreements between Bangladesh and India.

This research focused on four research questions: 1. What are the social and economic contexts operating in the floodplain and coastal fishing villages of Bangladesh? 2. What capitals and capabilities do fishers have to make a living? 3. What are the cross-scale drivers that impact fishers' livelihoods and entitlements, and how do fishers cope with changing situations?, and 4. What are the policy instruments and fishery management approaches? Chapter Four addressed research question one; Chapter Five dealt elaborately

with research question two, and Chapter Six dealt specifically with research question three. Research question four has been discussed in Chapter Seven.

This research, situated within the broad domain of sustainable rural livelihoods, examined divergent issues and the empirical realities that are so complex and interrelated their enquiry rather asks for both theoretical and methodological pluralism. Located within the appeals of human-in-nature relationships and sustainability science, this research cross-cut multiple disciplines like cultural anthropology and ecology, fisheries management, environmental ecology and community development. The very essence of this research is to acknowledge that fishers keep on developing experience and resilience as they face numerous livelihood challenges. The artisanal fisheries in Bangladesh are diverse in the contexts of ethnicity, capital and manpower mobilization, functioning of the higher socio-political power sources, resource base, and uncertainty and seasonality of production that singly or cumulatively determine one's position in the sector.

This research is intimately linked to sustainable development thoughts and practices and takes social, economic and environmental objectives into consideration. Viewing from an entitlement lens, the social-economic objectives are: equity, access to resources, livelihood security, share of food fish, and incorporating local management efforts into broader management plan. Environmental sustainability objectives are addressed through the use of indigenous knowledge capital (human capital). Obviously, it is only fishers' empowerment, and their active and sincere participation in the management process that can help to ensure a sustainable resource base and resilient management system. A resilient management system is one that has the ability to buffer a great deal of change or disturbance; it is considered synonymous with ecological, economic and social sustainability; one with low resilience has obviously limited sustainability (Berkes et al. 2002, Marschke and Berkes 2006, Berkes 2007).

### **8.1. The floodplain and coastal fishers: a comparison**

First of all, dichotomizing the artisanal fishers into inland Muslim fishers and coastal caste-based Hindu fishers oversimplifies the reality, as there is ethnic overlapping in both areas. Given the diverse and complex nature of the artisanal fishery (Berkes et al. 2001, Jentoft and Chuenpagdee 2009), there is hardly any scope of stereotyping fishers' activities under a

common and simple framework of life though the social and livelihood systems have some obvious parallels. While there are commonalities among the floodplain and coastal fishers in terms of the generic dependence on the natural resource base for their livelihoods, there are sharp differences between their social, economic, political and cultural roots and production relations.

Fishing communities in both study villages are poor or future poor; overall the condition of poverty and livelihood in the coastal Hindu village is dismal. Caste-based Hindu fishers are doubly jeopardized in the sense that they adhere to a religious minority in the country, and again within the wider society, their caste identities make them socially relegated. Though apparently the unregulated small-scale fishery is absorptive and accumulative in character, it is in fact gradually replacing the traditional Hindu fishers. The fear with these minority fishers participating in the marginal extractive economies is that they are increasingly exposed to a dominant intrusive structure imposed upon them. The corollary is that the coastal fishery might become narrower in terms of anthropological divergence, age-old indigenous knowledge and practices, institutions, and historic heritage. Historically, such relegation has pushed towards 'ethnocide' and the disappearance of traditional social relations, eventually culminating in an atomistic social order (Murphy and Steward 1956, *cited in* Ellen 1982: 54).

The livelihood strategies are complex in both study villages. Fishing appears to be an occupation of the last resort. In the floodplains, fishing is a daily earning career to many of the villagers, and access to land and leased waterbodies appear as one of the most important determinants of livelihood well-being, and fishers continue to negotiate with multiple power sources to enhance livelihood diversity. The social institutions symbolize typical patrifocal social structure with diversity in mechanisms in the Hindu fishing village. While the mosque-based leaders still dominate in the rural functioning of the floodplain village, their absolute authority might be shaken by the younger holders of remittance money and political powers. In a rapidly changing technology-oriented production system and demographic transformation, the working classes of both communities diffused into a larger and complex social aggregate in which they maintain their diverse cultural and ritual functions, yet with some overlapping, symbolizing secular performances.

Fishers' livelihoods are primarily the functions of the interplay with nature and natural resources within a socio-cultural and politically embedded framework. Their ecological knowledge base is the product of their interactions with the immediate ecosystem where they fish. It is not wise, from this point of view, to compare the knowledge base of the two fishing groups. Much of the knowledge base is also related to the unpredictability, vastness (or smallness) of the ecosystem, cultural roots, respect for nature and intergenerational transmission. From this point of understanding, as the coastal fishers cross a vast area in the sea in a very risky and unpredictable environment, their knowledge base is diverse and dynamic.

Traps of exploitations in the fishery emanate from numerous sources. Typical of fishantry, couples of these are ideologically endorsed inherent social mechanisms, unorganized nature of the fishers, ecotype isolations, revenue orientation of the state, and the behavior of 'rural corporatism' controlled by the holders of young capitals and higher socio-political power. All these favor the powerful groups in sustaining an erstwhile colonial patron-client coercive relationship in the fishing communities, especially in the coastal areas. Project-led horizontal mobility and the empowerment of fishers occurred, but the issue of sustainability remains a big concern.

## **8.2. Key findings**

Here follows a set of important findings which are commensurate to the objectives of the research. While generalizing the findings is difficult due to the contrasts in ecosystems and anthropological divergences in the study villages, some commonalities are still apparent.

### ***8.2.1. Fishers are subject to a low social status, and exploitation in the artisanal fishery is unavoidable because of its cross-scale relationships and perpetual dependence on input and support***

Dalton (1972:406, *cited in* Bates and Fratkin 2003) theorized that 'peasants from all times and all places are structured inferiors'. The peasantry, irrespective of its location, represents a politically dependent and often oppressed segment of the society. The interconnectedness with the extended network in the wider society for numerous supports inevitably required for fishing operations and post-harvest activities results in a coercive relationship and dependency syndrome in fishantry. Two observations can be made from this study:

- i. fishers have been exposed to exploitation for generations, turning them to passivity or fatalism, and
- ii. fishers' passivity is expected under the prevailing socio-political condition as they cannot afford to take risks that may threaten their livelihood in the long run.

The relatively low ethnic and social position and lack of power of the fishers prevent them from arguing for better marketing decisions under the existing asymmetrical socio-political and institutional power relations. The moneylenders and boat owners on the coast and leaseholders in the floodplains exert strong influence over the existing economic organizations of fishing and production relations.

The so-called 'low-classness' emanating from caste-based hierarchy in the case of Hindu hereditary '*jaladas*' fishers and the social-ideological praxis ('*Ashraf-Atraf*' dichotomy) of Muslim '*maimal*' fishers is evident in the study villages and wider communities. The socio-demographic transition is also noticeable. In the case of floodplains, the new entrant Muslim fishers have mostly replaced the Hindu fishers who dominated the fishery just a century ago, and the coastal artisanal fishery is also undergoing a similar demographic transformation. The Hindu traditional fishers lack political and legal support needed from the macro-institutions, and this process of marginalization further exacerbates their socio-political, economic and psychological disempowerment process. Regrettably, social marginalization and institutional exclusions eventually culminate into economic exclusion creating both direct and ripple effects on the poor fishers' livelihoods.

The production relations in the fishing communities are mainly determined by kinship relations and networks of obligations, each with typical roles and functions. The recruitment system is unilaterally determined by the boat owners, and fishers as laborers hardly have the benefit of any bargaining position. The fishers are recruited as seasonally paid laborers beside the usual pattern of catch sharing, which is unusual in artisanal fishery elsewhere in the Southeast Asia. The perishability of the fish as a product, poor infrastructure, typically framed exigencies of fishing, fishers' incapability of bearing risks of marketing, psychological and political submission to power sources, and absence of government support compel the artisanal fishers to sell their produce at a price dictated by middlepersons. Rural moneylending is pervasive and exploitive; however, moneylenders play critical roles for

fishers in filling financial demands during crises (seasonal, familial and social in nature). The NGOs seemingly select those fishers as target groups who can pay, rather than those who need, thus indirectly contributing to the continuance of poverty. Surprisingly, the microcredits and informal rural moneylending (*dadon*) have formed a typical blend in which money is circulated on both sides.

#### ***8.2.2. Livelihood is complex and multi-dimensional requiring support from wide-ranging institutions***

It is evident from the discussion on physical and financial capitals (Chapter Five) that the material bases of the fishers are extremely poor. The life sketch of 'Nirala Jaladas' of Thakurtala village (mentioned in the beginning of section 6.3 of Chapter Six), who lost her husband in the sea a decade ago, and since then continued waiting for social recognition as a widow, deserves special mention here. She, with her extremely poor capital base, had to depend solely on reciprocity and moral economic support from the community for maintaining the livelihoods of her family members. Simultaneously, the stringent social values have robbed her of independent decision-making power about her future. Fishers are forced to live sub-human lives by any standard of living, local or global. Their capabilities, endowments, rights and social functioning keep them confined to an 'equilibrium trap' from which many of them fail to exit. Though the capitals are location specific and vary in quantity and quality, livelihoods are strongly influenced by the access to and health of the natural resource base. As the very basis of the natural resources has been threatened in both the wetlands and coastal areas, fishers are forced to sniff around and negotiate with endogenous and exogenous forces for livelihood diversity.

Within the arena of local political and economic power relations and the concomitant typical forms of coercive production relations, fishers form a 'circle of belonging'. Typical of fishantry, fishers recurrently negotiate with multiple power sources for stretching their livelihood opportunities. Fishers design their own livelihood strategies based on their family composition, assets, past experience and social networks. In the cases of both study villages, the scope for engagement in non-fishing labor-absorptive occupations has been very limited. This stagnancy in the macro-economic situation bears serious implications in determining levels of underemployment and unemployment in the fishing villages. The demographic pressures eventually lead to Malthusian overfishing (especially in the coastal shrimp fishery),

a clear symptom of desperation in the open-access coastal fishery. The remittance money from Middle East countries creates significant impacts on the household economy and social transformation in the floodplain areas, but clearly fails to create an impact on rural enterprise development. Powerful remittance earners outside the fishing village rather impacted negatively through restricting fishers' access to leased waterbodies.

#### ***8.2.3. Fishers are continually exposed to multiple sets of human-induced and natural vulnerabilities***

Section 6.2 of Chapter Six examined the sets of vulnerabilities fishers are exposed to. The day-to-day struggle for meals for many of the fishing households clearly manifests the degree of vulnerabilities. This research concludes that fishers as a professional group are continually exposed to multiple stressors with differentiating impacts. Some chain effects originating from the very ecotype have been examined. Too much of the shrimp fry catching (at the immature stage) by coastal commons for shrimp farming, and the excessive harvest of shrimp brooders from the wild for use in the shrimp hatchery are perceived to have negative effects on the catch composition and value of catches in the ESBNs and MSBNs of coastal fishers.

Coastal fishing villages are worst hit by cyclones and storm surges; such disasters devastate all familial efforts for maintaining livelihood equilibrium. Fishantries on a collective basis has not been successful in resisting or negotiating with the external socio-economic and political pressures. Usually households devise sets of actions using their kin and limited social networks. Under any set of vulnerability, the poor and female-headed households with poor endowments are more affected than any others. The institutional mechanisms determining fishing entitlements exert tremendous impact on social exclusion. To mention a few: a productive *beel* leased out to a powerful outsider would obviously deprive local fishers; a favorable decision for increasing industrial fleets can ruin the small fishing units.

#### ***8.2.4. Fishers have little ability to deal with cross-scale shocks and stresses and their survival as a professional group is attributed to their coping strategies and culturally embedded fatalistic attitude***

Section 6.3 of Chapter Six portrayed the self-provisioning actions employed by fishers under multiple stress situations. Fishers sharpen their individual and social memories to adjust with abnormal stresses for very basic level livelihood functioning. Fishers, on the basis of their previous experience, undertake precautionary mechanisms to cope with multiple shocks and

stresses (Marschke and Berkes 2006). I registered there usually exists both male and female economy in the fishing households which are complimentary to each other. The female economy plays a very cautious and critical role when the male-headed economy is on the verge of collapse. The female economy, mostly based on austerity in familial expenses and little earnings from selling home-reared products, is often important in determining well-being and ill-being. Accordingly, many of the Hindu fishing women in the absence of their male counterparts for a prolonged period, rework their social networks and relationships for negotiating their survival. The age-old rural institution of reciprocity and moral economy among kin and neighbors proved helpful for the extreme poor and destitute in the fishing villages. This moral economy might fall down under massive poverty in the future. Culturally embedded faiths and concepts are seemingly helpful in adjusting with the existing poverty and traps of deprivation.

***8.2.5. Women play a very critical role in the artisanal fishery; nonetheless, their productive roles are often overlooked and undervalued by the wider society***

Clearly the notion of gender in different societies is culturally malleable, not something that is identical and static (Bates and Fratkin 2003). Artisanal fishery, especially the coastal fishery, is widely viewed as a predominantly male-centred enterprise. This view often undermines the critical roles and functions of the fishing women. Some of the special activities they perform in addition to traditional homemaking and caring roles are: observing numerous rituals at the households and community levels, making the fishing teams psychologically ready for the risky venture at sea, assisting the family members in organizing pre-voyage preparatory works, and tackling all the family affairs in the absence of their sea-bound male counterparts. One of my women respondents aptly commented that, by staying behind the curtain, women play critical roles in staging drama which the frontline audiences often do not see. The cultural construction of male supremacy at the sea fishing prevents the women in joining them, but women's direct participation in subsistence level fishing in the vicinity of their households is quite prevalent in both floodplain and coastal areas. In cases of poor fishing households, women contribute significantly through engaging themselves in critically needed economic activities (like fish segregation, solar drying, smoking, fermentation, vending, collection of aquatic resources, rearing livestock and poultry, homestead gardening etc.), which add to enhancing economic safety nets of the family.

Within the widely perceived patriarchal focus of the society, there is an interesting shift in the coastal fishing villages. There the commonly perceived patriarchal focus is interestingly reallocated to matrifocality, when the male fishers leave the households for about half a year. These women form special kinship relations inside and outside the villages which are again reoriented following the return of their male counterparts. However, this is not the case for daily fishing households. Unlike women engaged in the peasantry, the fishing community women are widely viewed as extroverted and courageous by wider societies. Their bad-mouth impression often helps them in safeguarding against rape and abduction in the remote coastal areas.

***8.2.6. Fishers have invaluable ecological and technological knowledge that fishery managers may use for planning and management***

I mentioned about the indigenous fishing knowledge in section 5.4 of Chapter Five. Many of the lessons I learnt from the experienced fishing gurus are more diachronic (based on long-term observation on specific sites) than synchronic (short-term observation on relatively large areas). Artisanal fishing operations throughout the world are based primarily on fishers' expert knowledge that they develop through trial-and-error learning in fishing and their interaction with the immediate environment. This indigenous expert knowledge can complement scientific knowledge (Johannes 1998, Johannes et al. 2000), improve decision-making (Berkes and Folke 1998, Baticados 2004), and provide practical information that can be used in management (Bergmann et al. 2004, Silvano and Begossi, 2005, *cited in* Grant and Berkes 2007) if the right kind of approach and techniques are followed. Eventually, such attempts are linked to the notion of achieving social equity and environmental justice by addressing the root causes of social inequalities for ultimately sustaining the resources and the ecosystem on which the poor fishers depend.

It is now widely agreed that natural and social systems are complex by character and the interactions between these two systems make their relationship even more complex and unpredictable (Berkes et al. 2003). Chuenpagdee et al (2005: 25) aptly state that fishery challenges need to be tackled by 'acknowledging the interconnecting concerns of ecosystem health, social justice, livelihoods and food security and food safety'. The diverse insightful TEK provides an awareness and appreciation of the fact that such peoples' knowledge can be utilized for sustainable management of the resources and understanding the ecosystem

dynamics. A few examples should suffice to realize the importance of TEK for fisheries resource management.

a. The Department of Fisheries (DoF) of the Government of Bangladesh, in cooperation with national and international experts, identified four major fishing grounds. This empirical research geo-referenced around 50 fishing sites from the Bangladesh territory of the Bay of Bengal; the sites identified by the fishers are relatively smaller on a geographical scale but obviously bear more significance from the viewpoint of territorial management.

b. Locally evolved techniques for fish aggregation (*Kantha* fishery) and catch maximization in the floodplains can also be positively translated for the conservation and sustainable management of aquatic resources.

This is possible only when fishers' knowledge is valued and space is created for their active participation. Again, this is not to say that all practices of fishers are in tune with resource conservation. Fishers are so knowledgeable about their immediate ecosystem that they combine a set of experience-based ecological observations and underlying principles prior to deciding to fish. This empirical research documented valuable body of TEK on important attributes. It recorded fisher's view of biodiversity that significantly varied from those of the broad-scale scientific research. The essential knowledge and critical skills required for fishers are the basics of ethno-biology, fishing sites and cosmological knowledge for reaching those sites, fishing operations, ecological knowledge, leadership and prompt decision-making ability. Each young fisher is a tiny explorer and researcher in his/her own ecological and social setting where a slow but precise mechanism of learning operates. The old Hindu fishers perceive there is an umbilical cord relationship between hereditary fishers and the sea. In fact, the concern for livelihood reinforces the young learners to learn from the skilled fishers.

#### ***8.2.7. Rituals play critical roles in making the fishers psychologically prepared for a risky profession and endowing them with mental harmony to other family members***

The cultural capital of the fishers with subsequent analysis of the significance and types of common rituals are described in the section 5.7 of Chapter Five. It is interesting to note that the ecological attributes not only appear as promoting or limiting factors for livelihoods, the

associated risks and uncertainty also contribute to the determination of cultural divergence. With the knowledge I have gathered from my observations in the study villages, I want to assert that the observance of rituals has tremendous value in the psychological revitalization of fishers which is critically needed to work in an environment characterized by risks and uncertainty, as well as social and geographical isolation. Rituals also foster a sense of brotherhood, interdependence, trustworthiness, team spirit, reciprocity and equalitarian attitudes among crew members. Bates and Fratkin (2003: 409) also claim that 'physiological changes occur in the individuals who participate as tensions and excitement rise to their peaks and then subside in the course of rituals'. These ritual behaviors, whether individualistic or communal, are structured and organized. Although it is true that 'many of the steps of their technological operations are laden with rituals and supernatural beliefs, what impresses one most are the strength of the fishers' technological rationality and the power of their inductive reasoning' (Raychoudhury 1980: 180).

Fishes play significant roles in the day-to-day life of Bengali. Where catches are plentiful and the level of perceived risk is low, there is hardly any observance of rites in the fishing villages (Malinowski 1918:90, *cited in* Pramanik 1993:113). I assert that the frequency of and devotion to religious rituals linearly relate to the degree of life risks and uncertainty of catches. The rituals are higher in the risk-prone coastal fishing villages, whereas in the floodplains where fishing is relatively risk free, one finds little observance of rituals. Interestingly, fishers maintain 'two cultural entities' while they are on sea bound fishing boats, irrespective of their kinship relations and religious faiths. Such a constellation of new values of secular beliefs for the common pursuit of survival, psychological healing and maintenance of a moral order in a risky and unpredictable environment bears socio-religious significance. I observed a sharp transformation in their behaviors, approaches and other soft attributes when the fishers are on the boat. Thus, knowingly or unknowingly, the crews themselves form a transient community whose values and norms are totally different from their land orientation.

***8.2.8. Legitimization of the territorial use right in fishery for professional fishers will help to reduce fishing pressure by commons and thus simultaneously help in the sustainable use of the resources***

In the section 7.4 of Chapter Seven, I mentioned the locally crafted resource management system 'faar' that is still prevalent in many of the coastal fishing villages inhabited by the hereditary Hindu fishers. For generations, such a system has been considered a socially acceptable and enforceable exclusive hereditary right. In the recent decade, the system faced considerable pressure from competing new entrants from surrounding areas. Though this system focuses largely on the tenure management on the coast, it carried some embedded values towards conservation and sustainable use of the resources. Again the prevalence of such a system relates to the very existence of the professional fishers. It is asserted that by designating property rights to the deserving community institutions, proper management of the resources along with ecosystem-resilience can be maintained through the rules, norms and networks of reciprocity followed by the resource-dependent communities (Berkes and Folke 1998, *cited in* Lobe 2002).

The entitlement can be legally demanded noting article 6.18 of the CCRF (Code of Conduct for Responsible Fisheries, Food and Agriculture Organization of the United Nations, of which Bangladesh is a signatory) which demands on states to take appropriate measures to protect the rights of the small-scale fishers for a secure and just livelihood, as well as preferential access, where appropriate, to traditional fishing grounds and resources (FAO 1995). Hauck (2007) mentions that in the cases of South African small-scale fisheries, the political economy of marginalization led to the exacerbation of 'protest fishing' by the impoverished fishers, which not only degraded the resource base, but also fuelled violent conflict and social unrest. This research emphasizes that for ensuring social justice and equity, certain zones which hereditary fishers have enjoyed for decades need to be earmarked. Similarly the government should terminate the existing leasing system that favors the powerful non-fisher elites.

### **8.3. Contributions to literature**

#### **8.3.1. Theoretical and methodological contributions**

##### **8.3.1.1. *'Fishantry' - a distinct conceptual domain for fishers is introduced***

For the analysis of social structures, livelihoods and class hierarchy of small-scale fishers, this research has introduced and justified the new concept of 'fishantry', typical of the artisanal fishery and fishers. It is apparent that although both peasants and fishers rely on a mostly manual labor-based production system, they possess distinct sets of indigenous knowledge, rituals, world views, and patron-client production relations. One of the most fundamental differences between peasantry and fishantry center around the issue of ownership over means of production. Peasants are producers who partly or wholly own the means of productions, while artisanal fishers are usually hunter-gatherers often with little control over many aspects of productions. I have argued that the peasant's world is land-oriented, while fishers are more oriented to different aquatic ecosystems and the resource base therein. Fishantry typically encompasses the complexities emanating from within and outside the fishing communities, the dynamics of the resources and ecosystems, and the nature of the responses to the complex problems.

Section 4.2 of Chapter Four provided a detailed analysis of fishantry from socio-political, economic, technological, evolutionary, risks and resource governance dimensions, which often behave as intertwined and inseparable attributes. A significant aspect of fishantry lies in the existence of dyadic relationships and interdependence, characterized by some form of reciprocity and exploitation within and outside of communities. In a globalized world, the simplest mode of artisanal production seems to become increasingly subjected to more external pressures and market relations; all these new settings force to transform their age-old social power structures, values and entitlements. This means that though artisanal fishers work in a small local setting, fishantry may function in a broader cross-scale setting negotiating with multiple sources of power.

##### **8.3.1.2. *Livelihood framework developed for artisanal fishery***

Contemporary livelihood frameworks do not put sufficient emphasis on the natural resource dependence, and hence adopting such a framework for the analysis of the typical natural resource-dependent livelihoods of fishers becomes complicated. Fishers' livelihoods in the

floodplain largely depend on decisions made on the leasing or sub-leasing procedures of the land administration that would singly determine one's fate. The role of political capital in this connection becomes vivid. Also, contemporary models ignore the unique role of the cultural capitals in the socio-psychological arenas of fishers, especially in case of traditional sea-bound fishers. This research suggested a new framework for understanding the dynamic patterns of livelihoods of the artisanal fishers. In my consideration, the inclusion of entitlement approach of Sen (1981) in the livelihood analysis is a good fit as a composite idea, and enjoys theoretical sophistication where some other similar ideas and concepts can also be amalgamated.

This research sets humans in their natural and social setting. Probably there is no denial of the importance of direct learning through active engagement with the fishers in different pursuits of fishing professions. Qualitative tools fetch more significance to the way of knowing about the '*what, how, why, where and when of things*', while the quantitative tools mostly adhere to the quantifiable aspects like volume or amount of things for ease of modeling and digital expressions. Participatory approaches, through sharing people's joy, pain, vision, conflicts, struggles and success, proved more inclusive and responsive, respectful, problem solving, visionary and empowering. The facts and figures drawn through participatory and visual methods proved to possess immense potential to think beyond classic ambivalence instead of calculating numbers generated through quantitative methods. Revisiting field notes and even primarily considered trash information proved useful to me in generating new ideas.

#### ***8.3.1.3. Contribution to the knowledge of livelihoods, fishers' knowledge, belief systems and socio-cultural institutions***

This research significantly contributed to the body of literature and knowledge of TEK in the artisanal fishery of Bangladesh. Various attributes considered important and pertinent through the fishers' lens are analyzed in-depth with empirical evidence. Available literature did not shed sufficient light on the 'knowledge-practice-belief' system of the fishers within the purview of Asian culture, transcendental worldview and social institutions. The value of the findings is immense from the perspective of strategizing local level resource management plan. If the indigenous lessons are purposively applied in a problem-solving context, better results than solutions dominated by Western technological fixes can be expected. By

examining the TEK of the geographically and culturally different fishing communities, this research enhanced our understanding about the inherent 'social, cultural and geographical context' of indigenous knowledge. I assert there is room for creative interaction between a scientist's way of resource management and the practical, innovative TEK of fishers for adaptive fisheries management. Based on empirical findings, this research has significantly contributed to the literature of fishers' livelihoods, social institutions and belief system.

### **8.3.2. Policy implications**

In Bangladesh, floodplain fisheries are dynamic and valuable, where complex institutional arrangements and access rights largely determine the distribution of benefits among different sectors of the society (Craig et al. 2004). Fisheries governance as complex adaptive systems must consider the inclusion of the 'phronetic dimension', and also move from the discipline-based technical knowledge to more components of human knowledge and perception (Berkes and Folke 2000, Jentoft 2006, Mahon et al. 2008, Jentoft and Chuenpagdee 2009). This research revealed that many of the problems affecting small-scale fisheries lie outside the realm of fishers and fisheries governance. Governance of the fisheries in a sustainable manner and alleviating fishers' poverty is fundamentally a political and economic process that asks for participatory structural adjustments in institutional, legal and management frameworks. Once an enabling environment and political space for genuine fishers is created, fishery managers respect fishers' knowledge and concerns, and make fishers actively involved in the management process, the regulations are likely to be more problem-solving and effective.

Although the country has attained remarkable success in the culture fishery, it showed reluctance in managing open water fisheries of the floodplains and coasts. Also, it lacks the input and skills necessary for long-term research and monitoring programs. This research helps us to realize that efficient management of the artisanal fishery based on 'forensic biological sampling' seems to be difficult without taking into consideration the invaluable TEK and mental record of the fishers. TEK is also much needed from the empowerment point of view. It must be acknowledged and appreciated that traditional fishers have survived a process of self-learning from a complex web of practices, value-laden norms and social relations for decades without leaning towards Western science.

I consider there is no particular mantra or any set of short-term measures that would bring immediate positive changes in the livelihood standard of the poor fishers. Personally I am not in favor of any relief or subsistence-oriented program because such programs tend to develop a culture of dependence on external assistance. Obviously locally appropriate measures for community-driven income diversification should be undertaken using micro-capital grants from NGOs or projects. Rather, I believe there is much more room to do in the area of fisheries management that would eventually help to develop their livelihoods. I have a few broad suggestions:

a. For the floodplain wetlands management, 'genuine' fishers should be involved as much as possible in activities from planning to monitoring the resources. The government should have a major shift from its revenue orientation towards the ethics of resource management and conservation. For this purpose, the wetlands administered by the Department of Land should be handed over to the Department of Fisheries. Privatization of the public fishing grounds caused social losses (Hossain et al. 2006). Citing examples from the leased-out floodplain waterbodies of Bangladesh (*jalmohal*) and Mekong Basin of Cambodia (*loh nesaat*), Bene (2003) comments that the leasing systems have led to a form of institutionalized exploitation of the fishermen by the power-holder elite class. Because of this institutional exploitation, fishers can realize only a small portion of the full economic benefits they produce from the common property resources. However, in the case of wetlands identified as 'mother fisheries' by the fishers, the local administration of the government, in association with the fisheries and law enforcing agencies, should manage the waterbodies as 'no take areas'. With its existing resources and administrative power, the Department of Fisheries (DoF) lacks the capacity to manage the waterbodies alone.

b. Given the present 'open access' regime, I will strongly recommend that, to have an assessment of the carrying capacity of the marine system and the current level of exploitation, the government should at least ensure the provision of licenses for all motorized and non-motorized fishing boats. For the ease of licensing, the responsibility should be shifted from centralized 'mercantile marine department' to DoF and local administration. The policy for increased introduction of industrial

trawlers should be revised using an independent body of experts. Law enforcing authorities should ensure the trawlers do not compete with the artisanal fishers at a depth zone below 40m. DoF needs to evaluate independently whether or not, the present resource base can sustain that many numbers of industrial trawlers, and stringent decisions should be made on the basis of the findings.

c. The fisheries planners of the country need to consider that, along with the management problems emanating from the country within, there are management problems which are of trans-boundary nature. For solving the cross-scale problems like massive sedimentation in the wetlands, the government should arrange regional discussions with the Meghalaya provincial authority to prevent deforestation and massive erosion, caused by limestone collection in the hilly region. In solving such management issues, the country may seek refuge in international agreements, conventions and laws. The "Code of Conduct for Responsible Fisheries (CCRF)" of the FAO, United Nations, approved in 1995, is a good instrument that encapsulates global best practices in fisheries management. Some other instruments with similar spirits would be useful in the broader context of fisheries management<sup>1</sup>.

d. In collaboration with NGOs, massive programs for social forestry and environmental conservation should be undertaken throughout the uplands of the wetland areas. This will obviously help in the environmental conservation in the Hakaluki *haor* areas. The experiences of development projects (like ECFC, SEMP, CBFM-2 and CWBMP) can be shared. The government needs to come forward to ensure economic safety nets.

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<sup>1</sup> It is to be applied in the context of and consistent with the binding fisheries instruments, namely the United Nations Convention on the Law of the Sea (1982), the 'Agreement to implement certain provisions of the United Nations Law of the Sea Convention of 10 December 1982 relating to conservation and management of the Straddling Fish Stocks and Highly Migratory Fish Stocks' (UN Fish Stocks Agreement), the 'Convention on Biological Diversity (CBD)', the 'Agreement to Ensure Compliance with International Conservation and Management Measures' (Compliance Agreement), Agenda 21, the 'Cancun Declaration of Responsible Fishing', the 'Kyoto Declaration on Aquaculture', 'Aquaculture Development Beyond 2000: the Bangkok Declaration and Strategy', and 'International Plan of Action for the Management of Fishing Capacity' (IPOA-CAPACITY).

e. The DoF needs to investigate the impact of residual insecticide flows from the upland tea gardens on the fauna of the *haor*. A dialogue with the tea garden owners is necessary for minimizing the potential damages caused by insecticide flows.

It is not logical to expect good governance for fisheries in isolation from major institutional transformation. An active process of fishers' participation in the resource governance is very much a political issue, and it relates to the capacity of the existing institutions. For sustainable resource governance, there is the need for continued prevalence and exercise of good governance, political commitment, transparency, and efforts for building fishers' empowerment at all cross-scale institutions through visionary leadership.

#### ***8.4. Limitations of this study and dimensions of further research***

This research can be blamed for not considering secondary facts and statistics on fisheries from the government and academic sources. I avoided that information deliberately due to authenticity problem of data sources. This research is about fishers- their knowledge and livelihoods, and hence, rather than going to scientists to learn about systems and resource dynamics, I relied heavily on experienced fishing doyens for the real knowledge about aspects of the fisheries.

The disciplinary boundaries make the bridging of inter-disciplinary approaches complicated. My background is in the discipline of Marine Science (*in the university, I was never inspired to accept as true that 'fishing community' is researchable to the fishery scientist*). However, the professional experience I have gathered working with the artisanal fishers for more than a decade, has proved mutually exclusive to offset my limitations of not being a 'social scientist'. Humbly mentioning this, I sincerely tried to dig out research issues to the extent that an intelligent and diligent human being is able to do. Future research should be concentrating on livelihood dynamics of riverine fishers dependent on the *Hilsa* fishery- the single most important fishery for Bangladesh, and the fishers involved with 'natural carp hatching' at *Halda* river of Chittagong. The fishing sites of the Bay of Bengal as mentioned by fishers need to be geo-referenced by using GIS machines.

Finally, I would like to mention this study is a step forward in the study of fishers' livelihoods, and hence the content pales to the real richness of the fishers' livelihood strategies and knowledge. Of course, there is a lot more to learn from the fishing gurus of the

artisanal fishery. For me, there are countless 'aha!' moments of learning (especially, regarding indigenous knowledge and culture) from the fishers, but my reflexivity from field observations on the persistent hunger of the fishing families and their relentless efforts for simple meals continue to haunt my memory.

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## Appendix 1: Socio-economic and livelihood survey form

Socio-economic and livelihood survey

NRI-WFC collaborative research on floodplain and coastal fisheries management

Natural Resources Institute

University of Manitoba, Winnipeg, Manitoba, Canada R3T 2N2

**Statement seeking consent**

*My name is Apurba Krishna Deb, I am a PhD student at Natural Resources Institute, University of Manitoba, Canada. This survey is intended to improve our understanding about the livelihoods aspects of the rural fishing community. I consider you as a knowledgeable and experienced person about the issue, I am trying to explore. The interview will take around 30-40 minutes of your valuable personal time. You are under no obligation to participate in the interview. If you intend to participate, please feel free to discuss your opinions openly. You have the freedom to end the interview, any time or refuse to answer specific questions. In such an event, you can simply mention 'no comment'. Your responses will be held in strict confidence, and the results of the study will be compiled with no reference made to specific participants.*

*This research is being funded by the 'Social Science and Humanities Research Council (SSHRC) through a grant. World Fisheries Center (WFC) is assisting us in the process. We all are working together to improve the process of fisheries management with an ultimate view of sustainable resource management in the country. We all are partners in this journey. Your information and opinion is definitely considered valuable to us. Ethics Review Board of the University of Manitoba has approved this questionnaire and the proposal. If you have any question or concern, you may contact with the chair of the Ethics Committee or Dr. C. Emdad Haque, Director, Natural Resources Institute at 204-474- 8373.*

**General information**

Respondent identity:

ID no.	1	2	3	4	5

(1:Upazilla, 2: Village, 3-5: Respondent)

Religion (optional): ☐ Islam ☐ Hindu ☐ Buddhist/Rakhain ☐ Christian ☐ Other (Pl. mention.....)

Interviewer.....

Date: .....

**Landscape of the area:**Type of area: ☐ Coastal area ☐ Island/Char ☐ Hilly ☐ Plain landA glance of condition: ☐ Rich ☐ Middle ☐ Lower-middle ☐ Poor ☐ Extreme poor

Spot checked by .....

Edited by ..... Coded by .....

## Section 1. Household Composition

Sl.	Members	Relation with HH chief	Sex 1-M, 2-F	Age (Years)	Marital status	Educa-tion	Main profession	Secondary profession	Member-ship, if any	Skill	Physical condition
A*	B*	C*	D*	E*	F*	G*	H*	I*	J*	K*	L*
1											
2											
3											
4											
5											
6											
7											
8											
9											
10	Other regular members										

**C\* Relationship:** HH chief: 1, wife/husband of HH chief: 2, son/daughter: 3, father/mother: 4, brother/sister: 5, son's wife/son-in-law: 6, grandson: 7, nephew/niece: 8, servants: 9, , father/mother-in-law: 10, brother/sister-in-law: 11, Others: 99 (Please mention.....)

**F\* Marital status:** Unmarried: 1, Married: 2, divorced: 3, separated: 4, widow: 6, single: 7, abandoned: 7, polygamist: 8

**G\* Education:** Class 1: 1, class 2: 2, class 3: 3, class 4: 4, class 5: 5, class 6: 6, class 7: 7, class 8: 8, class 9 and 10: 9, SSC: 10, HSC: 11, Degree: 12, Post-graduate: 13, illiterate: 14, only can write name: 15, only ca read: 16, both reading and writing: 17, not applicable: 18, Others: 99 (Please mention.....)

**H\*, I\*: Profession:** Boatman: 1, Jr. boatman: 2, driver: 3, sr. labourer: 4, jr. labourer: 5, service: 6, business: 7, daily labour: 8, domestic HH works: 9, rural transportation: 10, Homebased works: 11, student: 12, net weaving: 13, farming: 14, bettlenut farming: 15, own shop: 16, shrimp fry catching: 17, wood collection: 18, raw fish selling: 19, fish drying and selling: 20, owner of nets: 21, owner of nets and boats: 22, owner of boat: 23, company/bohoddar: 24, moneylender: 25, artisan: 26, livestock rearing: 27, chicken/duck rearing: 28, rickshaw pulling: 29, old/inert: 30, jobless: 31, subsistence fishing: 32, fulltime fishing: 33, not applicable: 34, Others: 99 (Please mention.....)

**J\* Membership:** Project: 1, BRAC: 2, Prashika: 3, ASHA: 4, CARE: 5, World vision: 6, Ganashastya: 7, COAST: 8, RIC: 9, Grameen Bank: 10, Not applicable: 11, Others : 99

**K\* Skill:** Mechanic: 1, net weaving: 2, sewing/artisan work: 3, handicraft: 5, weaving machine: 6, singer/player: 7, diver: 8, handicraft: 9, not applicable: 10, Others: 99 (Pl. mention.....)

**L\*: Physical condition:** If handicapped or severely malnitrated body: put tick sign (✓)

## Section 2. Living Condition

### 2.1 Description of the dwelling house:

Owner of the house	Area (excluding garden and pond)	Rooms		Construction materials				Additional information
A *	B *	C		D *				E
		No.	Ft	Wall	Roof	Floor	Value	

**A\* Owner of the house:** HH chief: 1, Wife of HH chief: 2, Wife and HH chief: 3, son of HH chief: 4, wife and children of HH chief: 5, khas land: 6, rented: 7, others 99 (Please mention.....)

**B\* Area of land:** convert to decimal, allow respondent to mention in his own calculation

**D\* Housing materials:** brick: 1, bamboo: 2, jute stick: 3, tin: 4, thatch: 5, golpata: 6, tally: 7, concrete: 8, clay: 9, polythene: 10, Others: 99 (Pl. mention.....)

### 2.2 Latrine, drinking water and electricity:

2.2.1 Do you have latrine in your house? (Yes=1, No=2)

If yes, types of latrine:

(Code: Sanitary/ring slab: 1, earthen : 2, bush: 3, open field: 4, hung latrine: 6, others: 99 (Pl. mention.....)

2.2.2 What about the source of drinking water?

(Code: Tubewell/supply/tape: 1, well/pond/river/channel: 2)

2.2.3 What sort of water do you use for domestic uses?

(Code: Tubewell/supply/tape: 1, well/pond/river/channel: 2)

2.2.4 Tubewell: Self  Joint  Neighbor  DPHE  NGO  Others  (Pl. mention:.....)

2.2.5 Do you have electricity? (Yes=1, No=2)

### Section 3. Assets and Properties

Sl. No	Asset code	No.	Value	Ownership 1. Self, 2. Joint	Asset/materials code
A	<b>Fishing materials</b>				<b>Gear related: -</b> ESBN: 1, MSBN: 2, current jal: 3, push net: 4, encircling net: 5, lift net: 6, gill net: 7, cast net: 8, lift net: 9, clap net: 10, traps: 11, hook and line: 12, spear: 13, N/A: 14, Others: 99 (pl. mention.....)
1	Net				
2					
3					
4					
5	<b>Boat</b>				<b>Boat related:</b> Small wooden unmechanised boat: 1, Medium unmechanised wooden boat: 2, Mechanized boat: 3, N/A:
6					
7					
8					
9	<b>Engine</b>				<b>Engine related:</b> 2-10 HP: 1, 11-20 HP: 2, 21-30 HP: 3, 31-40 HP: 4, 41-50 HP: 5, %1 plus HP: 6 N/A: 7,
10					
11					
12					
B	<b>* Land (excluding homestead)</b>	<b>Area</b>			<b>Land related: Self: 1, garden: 2, leased: 3, , temporary lease: 4, long-term lease: 5, khas land possessed: 6, N/A: 7</b> * no need of calculating value of khas land
1					
2					
3					
4					
C	<b>Agricultural equipment</b>				<b>Agri. Equipment: Plough: 1, spade: 2, harrow: 3, power tiller: 4, deep tube well: 5, shallow well: 6, husking engine: 7, N/A: 8, Others: 99 (Pl. mention.....)</b>
1					
2					
3					
4					
D	<b>Other materials (non-agri.)</b>				<b>Other materials: Wood handicraft machines: 1, masonry equip: 2, sewing machine: 3, sanitary equip.: 4, electrical equip.: 5, domestic equip.: 6, N/A: 7, Others: 99 (Pl. mention.....)</b>
1					
2					
3					
4					
E	<b>* Livestock</b>				<b>Animals: Cow: 1, buffalo: 2, sheep: 3, goat: 4, duck: 6, Hen: 7, pigeon: 8, N/A: 8, Other: 00 (pl. mention.....)</b>  * Calculate average prize in case of different age group category of animals.
1					
2					
3					
4					
F	<b>Transportation</b>				<b>Means: Boat, rickshaw: 2, engine boat: 3, motor cycle: 5, bullock cart: 6, bicycle: 7, N/A, Others: 99 (Pl. mention.....)</b>
1					
2					
3					
4					
G	<b>Domestic valuables</b>				<b>Valuables: Bed: 1, Clock: 2, Radio: 3, TV: 4, show-case: 5, furniture: 6, ornaments: 7, valuable shari: 8, N/A: 10, Others: 99 (Pl. mention.....)</b>
1					
2					
3					
4					
5					
6					
7					
8					
H	<b>* Pond</b>	<b>Area</b>			<b>Ownership status: Self: 1, Own with family: 2, joint ownership: 3, leased: 4, N/A: 6, Others: 99 (Pl. mention.....)</b> * Use decimal after conversion
1					
2					
3					

## Section 4. Food Security

4.1 Do you have surplus stock of rice/wheat/paddy for future use? (Yes = 1, No = 2)

(Not applicable if stocked for grocery shop)

☐

4.2 If yes, what type of food? Rice ☐ Paddy ☐ Wheat ☐ Potato ☐ Dry fish ☐ Others ☐ (Pl. mention...)

4.3 How many kilograms? Rice ☐ Paddy ☐ Wheat ☐ Potato ☐ Dry fish ☐ Others ☐ (Pl. mention...)

4.4 Source of stocked food : ☐ ☐ ☐ ☐ ☐ ☐

Code: Self production: 1, From leased land: 2, From labour exchange: 3, Bought from market: 4, Bought from neighbour: 5, Loan: 7, Gift: 8, Others: (Pl. mention....)

4.5 Economic situation in the last one year (put tick sign where appropriate)

Economic condition	Baishak	Jaistha	Ashar	Sraban	Bhadra	Ashin	Kartik	Agryan	Poush	Magh	Falgun	Chaitra
*Surplus												
*Equal												
*Scarcity												

\* Surplus: Some amount is left after modest livelihood

\* Equal: Hand to mouth

\* Scarcity: More expenses than income, have to borrow

4.6 How many meals you have a day? ☐ How many KGs of rice you need a day? ☐

In crisis period, how many meals you have a day? ☐ KGs of rice you need/day ☐

4.7 What do you use for cooking? ☐

Code: Dried cowdung: 1, wood: 2, husk: 3, jute stick: 4, electricity: 5, leaves/shrubs: 6, kerosene: 7, Charcoal: 8, straw: 9, gas: 10, bamboo: 11, Others: 99 (pl. mention.....)

## Section 5. Employment

5.1 For how many days you go for fishing per trip? Good season ☐ Bad season ☐

(Code: Day to day: 1, 2- 6 days: 2, 7-15 days: 3, 1-4 months: 5, 5-7 months: 6, N/A: 8)

5.2 If you are a paid worker, what about the agreement? Month ☐ Tk ☐

5.3 How many of your HH members are under such agreement? ☐ Person

5.4 How much money you get per trip, if you are a paid worker? ☐ Tk/day

### 5.5 How the share of caught fish determined?

(distribute shares as per labor hierarchy)

a) Excluding expenses:  % share of boat  % share of nets  share of fishers

b) Out of one thousand:  Owner  Boatman  Laborers

5.6 Does the owner of the unit go for fishing directly? (Yes = 1, No = 2)

If yes,  times/month,  times/day

## Section 6. Liabilities

6.1 Is any member of your HH indebted? Yes  No

6.2 If indebted, please provide us the following information.

Member No.	Source of loan	Received Which month	Amount in Tk.	Use of loan	Interest rate	Amount paid back	Amount due	Any mortgage to get loan?	
								What	Value
A	B *	C *	D	E *	F	G	H	I *	J

\*B Source of loan: Relatives: 1, Friends: 2, Neighbor: 3, Boat owner: 4, Moneylender: 5, Bank: 6, NGO: 7, Others: 99 (pl. mention....).

\*C Which month: Baishak: 1, Jaistha: 2, Ashar: 3, Sraban: 4, Bhadra: 5, Ashin: 6, Kartik: 7, Agryan: 8, Poush: 9, Magh: 10, Falgun: 11, Chaitra: 12

\*E Use of loan: Net purchase: 1, boat purchase: 2, fish business: 3, Crop production: 4, Land purchase: 5, Livestock purchase: 6, poultry purchase: 7, dowry: 8, food purchase/familial: 9, treatment: 10, house repair: 11, previous loan payment: 11, N/A: 12, Others: 99 (Pl. mention.....).

\*I: Mortgage: Land: 1, Gold: 2, Clock: 3, Brass items: 4, house: 5, Livestock: 6, engine/boat/net: 7, N/A: 8, Others: 99

6.3 Any amount due in the grocery?  Yes  No

6.4 If yes, amount in Tk. \_\_\_\_\_

## Section 7. Savings

7.1 Do you have any savings? Yes  No

7.2 If yes, where?

Code: Project VO fund: 1, NGO group: 2, Post office: 3, Bank: 4, Savings documents: 5, Insurance: 6, Land leasing: 7, loan to others: 8, Others: 99 (pl. mention.....)

7.3 Total amount of savings in Taka

## Section 8. Participation in Social, Political & Other Institutions

8.1 Do you participate in social, political and other institutions? (Yes=1, No=2) ☐

8.2 If yes, what is that?

☐ ☐ ☐ ☐ ☐ ☐ ☐

**Code:** Religious committee: 1, school committee: 2, Project committee: 3, other village committee: 4, market committee: 5, UP member: 6, club committee: 7, cultural committee: 8, NGO committee: 9, No participation: 10, Others: 99 (Pl. mention.....).

## Section 9. Income & Expenditure

(Allow the respondent sufficient time and assist in calculation).

Source of income	Annual income (Tk.)
Fishing	
Fish sale/retailing	
Dry fish sale	
Net weaving and selling	
Salting	
Fry catching	
Agriculture work	
Homestead gardening	
Daily labour	
Fish culture	
Service	
Sewing	
Livestock/poultry	
Bettle leaf	
Singing/play on music items	
Money lending	
Mechanic/technician	
Diving	
Small grocery	
Nursery	
Rikshaw/van pulling	
Others.....	

Source of expenditure	Annual expenses (Tk.)
Food	
Treatment/medicine	
Cloth	
Shelter (construction/repair/rent)	
Education	
Investment (Agri./business)	
Purchase domestic items	
Gold purchase	
Marriage/dowry	
Loan repayment	
Net purchase	
Boat purchase	
Engine purchase	
Repair of equipment	
Lease/rent etc.	
Land/pond purchase	
Agri. Equipment purchase	
Religious programme	
Social programme	
Obituary	
Entertainment	
Others.....	

## 10. Crisis and Coping Strategies

10.1 What sort of crises you faced in last 12 months?	10.2 How did you tackle those crises?(Put tick marks)
Flood, excessive rain	Loan from neighbor
Drought	Loan from moneylender
Salinity	Loan from NGO
Land slide/erosion	Loan from others
Cyclone	Taking less food
Less fish catch	Food stuff on loan
Disease	Land sale
Accident	Land lease
Death of HH member	Fishing equipment leased
Death of earner	Fishing equipment sold
Divorce	Big trees sold
Lost job	Livestock/poultry sold
Theft/dacoity	Excessive Physical labour
Robbing of net/boat by pirates	Gold/other valuable sale
Eviction	Helplessness/fatalistic attitude
Social conflict	Child labour
Religious conflict	Homestead land sale
Dowry	Use of savings
Child/women trafficking	Displacement/migration
Physical/mental torture	Change of profession
Boat sunk	Begging
Others (Pl. mention.....)	Others (Pl. mention.....)

## 11. Status of Women (Ask if the respondent is a woman)

11.1 What do you do outside your homestead activities (Pl. put tick marks)	11.2 Which decision you took independently in the last one year (Pl. put tick mark)
Raw fish/crab sale	Little amount of food stuff purchase
Raw fish segregation/cleaning	Surplus food stuff purchase
Fish drying and selling	Poultry purchase/sale
Daily labour/maid servant	Seeds sale/purchase
Net weaving/repairing	Stationaries purchase for education
Wood collection	Toiletries purchase
Service	Gold purchase/sale
Study	Purchase of kid's cloth
Fry catching	Purchase of own cloth
Social programmes	Purchase of men's cloth
Religious programmes	Utensils buy/sale
Midwifery	Daily necessities purchase
Organizational work	Land purchase/sale
Plant nursery	Fishing equipment sale/purchase
Sewing	Marriage of daughter
Money lending business	Marriage of son
Grocery shopping	Legal document signing
Vending	Maintenance of family husband's absence
Others(Pl. mention.....)	Others (Pl. mention.....)

11.3 Where did you go after marriage (Ask only the married woman)	
Paternal house	*
Relatives house outside village	
NGO office	
Local markets	
Nearest upazilla centre	
Cinema hall	
Cultural programmes	
Political meeting	
Casting votes	
Union parishad	
Children's school	
Government office	
Outside for shopping	
Hospital	
Code: Alone: 1, With husband: 2, With adult: 3, With young boys/girls: 4, Never: 5	

11.4 What resources you have? Can you sell or hand over those at your own decision?		
Resource	*Ownership	*Right to handover
Land		
Pond		
Garden		
Homestead land		
Livestock		
Poultry		
Gold		
Sewing machine		
Fishing equipment		
Agricultural equipment		
Savings		
Fishing equipment		
Cycle/van		
Code: Ownership pattern: Inherited: 1, Purchased: 2, Gift: 3, Own earnings: 4, Any other way: 5		
Rights to hand over: Yes: 1, No: 2		

11.5 At what age, you got married?

Did your father pay dowry? If yes,

Did you take dowry for your son?

If yes, in Taka (Asset and cash)

Did you pay dowry for your daughter?

If yes, in Taka (Asset and cash)

--	--

--	--	--	--	--	--

Not relevant

	Yes		No
--	-----	--	----

Not relevant

--	--	--	--	--	--

	Yes		No
--	-----	--	----

Not relevant

--	--	--	--	--	--

(Thank you for your valuable time and co-operation in the research)

**Appendix 2: A comparative view of the capitals between the floodplain and coastal study village (source: Series of FGDs, 2005).**

Financial	Natural	Social	Human	Physical	Political	Cultural
<b>Coastal fishing village 'Thakurtala'</b>						
Overall, a dismal scenario of old and new poverty prevail. Most of the villagers have poor earnings that are quite insufficient to sustain lives. Many villagers are entrapped into money lending; have little or no access to commercial banks. NGO's role in economic development is limited.	Easy access to the sea through the Moheskhal channel; mangroves forests and hills near the village; vegetative cover of old coconut trees in the village (poor yield); little vegetable and plant diversity due to frequent inundation by sea water causing increased salinization of soil. Very limited access to land; almost entirely dependent on the availability of fishes for livelihoods for years; most vulnerable to sea-borne calamities.	Traditional form of village leadership (Chapter 4); men and women organized by ECFC project; regular savings and capacity development meetings; general awareness about hereditary aspects of fishing and caste unity displayed; women enjoy relatively better mobility compared to rural peasant society; historically neglected and relegated by both government and mainstream societies; exposed to inter-and-intra-community exploitation.	Highly skill in coastal and marine capture fishing; traditional bondage to skill and knowledge transfer for generations; low level of education among elders; many elders do not find any correlation between level of education and skill for fishing; ECFC project supported non-formal community school running since 2003; fishers never trained on fishing skills and regulations by NGOs or govt. officials; access to immunization and other basic health programs through networking by ECFC; attended series of trainings on disaster preparedness, alternative income generation, capacity building etc.	Extremely poor infrastructure and housing facilities; inter-hamlet road developed by ECFC; one small temple inside village; one 'Village Resource Center' (VRC) used as school & community functions; mostly dependent on non-mechanized boats; Only 4% families have access to electricity. Low level of household valuables also.	Politically docile historically; poor network; ignored and exploited by mainstream leaders; boat owners prefer to keep linkage with powerful Muslim moneylenders for support and assistance in crises. Isolation due to stay in the sea is an obstacle. Scared to display activities as subservient minority.	Long heritage of rituals and rites; differ in worldviews from the mainstream Hindus; women play distinct roles in organizing activities; mostly centered on risk and uncertainty notions in sea; influenced by <i>Adinath</i> temple and sea-based goddesses.
<b>Floodplain village 'Volarkandi'</b>						
Relatively better off due to diverse income source from water and land based activities; few families have access to remittance money; NGO's role is limited.	Surrounded by vast water body and aquatic resources; swamp forests declined; NGOs planted exotic species that did not suite well with local ecosystem; intense sedimentation; extremely important for livelihoods of poor and destitute women.	Known as ' <i>maimal</i> ' community, relegated to the wider society; young generation leadership is gradually showing up; mosque committee plays critical role for social harmony; small faction of Hindu families comfortable with majority Muslims.	Developed high skill for fishing in floodplains for generations; the value of education for children is appreciated; immunization is low as it is perceived by many as a shrewd attempt for 'building impotency' of Muslims by the Americans; CNRS is well-known for raising awareness among fishers on resource conservation and habitat restoration.	Poor earthen roads; a small bridge connects channels and fish landing center; absolute dependence on small boats during floods; mosque and a small ' <i>madrasha</i> ' for religious education. A few small buildings; two small tea-stalls & one medicine outlet.	A small section maintains networks with local and land administration and NGOs to make best use of development projects; remittance flow helps to build political factions.	Displays a combination of mainstream Islam and mystic Sufism; women widely secluded; little fishing oriented rituals; super-natural beliefs prevail.

Appendix 3: Gears commonly used in the floodplains and coasts

Name	Salient features and operation	Targeted species	Economics	Remarks
<b>Gears commonly used in the floodplains</b>				
Gill net (Suti jal/ Faash jal/ nylon net/ current jal)	<i>Suti jal</i> is a rectangular net composed of 20-30 pieces; each with L50m, W 3.5m, #2.5-5cm, uniformly throughout net; supported by float at the interval of roughly 1m; upper and lower end supported by coarse rope. The fishers of Volarkandi operate these nets in the 'Pingla, Lagoa, Katua, Kukurdubi, Jolla, Digha, Chatla, Mosna beel' of Hakaluki haor. Specifications vary with the targeted species. For example 'puti jal' is a gill net (L20-30m, W 1-1.5m, #2-3cm) for targeting <i>Puntius</i> spp. and 'koi/fut jal' (L20-30m, W 1.5-2m, #2.5-3.5cm) targets climbing perch ( <i>Anabus testudineus</i> ). A much discussed variant is monofilament gill net ( <i>Current jal</i> ). This widely used net is usually composed of 20-30 pieces; each with L50m X W 1.5-2m, # 2.5-10 cm; mesh varies for targeting different species in different seasons; old slipper pieces, buoys or plastic bottles used as floats; hung from surface; some fishers beat surface water so that fishes move and gets entangled. Operational difficulty is that it is not easy to pick out fishes from entangling meshes. Fishers clear up dense vegetative structure of the waterbody to make long straight line where they set the net and beat around with bamboo to drive fishes towards the nets. Used from mid-April to mid-October ('Baishak to Ashwin') depending on depth of waterbody.	Larger species like <i>Labeo Rohita</i> (Rui), <i>Catla catla</i> (Catla), <i>Cirrhinus mrigela</i> (Mrigela), <i>Notopterus chitala</i> (Chital), <i>Wallagu attu</i> (Boal), <i>Mystus aor</i> (Ayre), <i>Channa striatus</i> (Shoil) etc. are targeted by the large meshed net, while smaller meshed net usually targets small to medium sized fishes like <i>Gudusia chapra</i> (Chapila), <i>Puntius</i> spp. (Puti), <i>M. vittatus</i> (Tengra) and <i>C. punctatus</i> (Taki).	Longevity is around 3-4 years; costs around US\$ 15-150 depending on size, materials and specifications. Catch per unit effort/day (CPUE) vary between 2-20 kg depending on season and productivity of the waterbody	Due to its high efficiency, cheaper price and availability in the local market, monofilament nets almost replaced the traditional cotton made version. Fish act 1950, sets penalty and imprisonment for the use and storage of this banned destructive net. Reportedly imported illegally from Myanmar and Thailand. The net is bright-silvery with similar refractive index of water and hence escapes attention of fishes
Lift net (Veshal/ bell/ tong/ tola/ dharma jal/ sherjali/ tonny/ charkuni)	A typically designed V-shaped triangular net usually fixed and operated with sufficient skill on the waterways; a destructive non-selective gear found to catch fishes and prawns on their way of migration/movement with incoming and receding water. Fixed with two long bamboos; tapering end of the bamboos are joined together and fixed with another sets of bamboos fixed on the soil; specifications are L10-15m, W 5-7m and # 15-25 mm at the anterior portion and 4-5mm throughout the rest and conical end. Usually the whole structure is fixed with a platform, 1-2m above the water level, from which the fisherman regulates the whole net. The fisherman slowly drops the net into water and pulls up after 10-20 minutes using a strong rope and simultaneously putting pressure on the joined bamboos to ease the lifting process. The conjunction points between the vertically and horizontally set bamboos act as 'leverage points'; fishes trapped gradually accumulate at the fag end of the net as the fisher jerks the net; fishes are kept live in a big bamboo made 'dula' fixed behind the platform. A simple variant of big lift net called 'dharma jal' (L 7-10m,	Depending on seasons and locality, usually small fishes like berbs, catfishes, prawns, loaches and juveniles of major carps are caught indiscriminately. 'Sherjal' usually targets clever fish <i>Rhinomugil corsula</i> .	Total structure costs like US\$30-75 and the longevity is like 1-3 years. CPUE/d is 3-10 kg.	Importantly, the operation of the lift net symbolizes power and authority over certain locations; outsiders are not allowed to set this gear without socially recognized <i>de facto</i> right. Some strategically important locations are illegally leased out by the local chairman. CBFM led executive committee members are also found to operate this gear in the channel of the study village. Some leaseholders allow fishers to set nets on payment.

	W 4-5m, #3-5mm) is operated by subsistence fishers from the edge of beels and channels where fishes aggregate with flash floods for spawning. 'Sherjal' is also a variant of 'dharma jal', closed at three sides and only anterior part is kept open.			
Traps (chai/fori/dori/parong/ronga)	The traps represent simple, age-old, ecologically suited and culturally framed artistic creation of fisherwomen with its finest design, make up and finishing. Simple one with two entry points and a common compartment inside with L0.4m, W0.25-0.3m, H0.3m, made of thin bamboo splits. Usually set by 10-11am and replenished with lures in the following morning. Fishers mostly use the flesh of small snail, locally known as 'gugail' inside the trap @ 100-150gm/trap to lure fishes. Mixture of burnt rice bran ('Kura') and wet cow dung ('gobor'), and pieces of earthworms are also used. Traps are set with or without a mark in strategic locations like edge of 'kandi' (upland). Collection of snail for use as lure is done at night by the fishers themselves using push nets. Some poor people collect snails as a means of livelihood. 'Maijler dak, Dagor kuri, Katua kupidubi, Balijuri, Chirua baia, Koierkona, Gorchikona, Hogla, Chepti and Gila beels' of Hakaluki haor are the hot spots for trap operators. They remain confined to a distance of 1-3 km from homestead areas. Larger variants are: 1. 'fori/dori/boro chai' (rectangular, multiple compartments and entry points, L0.5-0.7m, H0.5-0.6m, W0.3-0.4m), 2. 'Parong' - a table sized trap with 4 chambers inside and 3. 'Ronga' - a conical shaped (L1.75-2m, W0.5m); used at conjunction of running water during monsoons and post-monsoons.	Specially 'Tengra' ( <i>Mystus vittatus</i> , <i>M. bleekeri</i> and <i>M. cavasius</i> ) fishes are selectively and extensively caught. A small numbers of 'Shing' ( <i>Heteropneustes fossilis</i> ), 'Magur' ( <i>Clarius</i> spp.) and 'Puti' ( <i>Puntius</i> spp.) fishes are also occasionally trapped.	Each trap costs around US\$ 0.5-1 depending on the seasons; longevity around 3-4 months. Each boat can accommodate 80-120 traps; earning varies from US\$ 8-18 during mid-April to late November with peak catches from mid-May to mid-August.	The <i>de facto</i> rule is that before the dyke becomes visible, 'chai' operators can set their traps. Small traps are extensively used by Hindu 'Biswas' caste fishers of 'Pabijuri' village and some Muslim fishers of Volarkandi around the study village. Also used at subsistence level by housewives and youngsters around their house. 'Sankarpur village of Nabiganj' and 'Satgaon village of Sreemongal' are famous as trap artisans.
Hooks and long line (Barshi/lotka/lahar barshi)	Used by the fishers of Volarkandi for commercial fishing and also subsistence fishing with variation in hook types and intensity of operation. The baits vary based on species targeted and availability. Operation of hooks continue from mid-April to mid-November; long line ('lotka/ lahar borshi') operators maintain roughly 300-700 hooks/boat; around 10-12 hooks (one 'kara') are hung from a coarse rope tied with two bamboo sticks on the soil. Hooks are set close to water level with live baits to attract predators or at a depth of 0.5-1m from surface with inert smelly baits to attract predatory fishes. Some fishers are known to hang small candles or kerosene lamp ('hurricane') on the bamboo to attract fishes during new moon nights. Some fishers use aromatic materials (like <i>ekangi</i> , <i>methi</i> - <i>Trigonella foenum-graecum</i> ) to attract fishes in the vicinity. Hooks are usually set in the evening and replenished during morning; Fishers use multiple hooks (No. 8-12 hooks for predators and No. 15/16 for small fishes).	Among the catches, <i>Wallagu attu</i> is dominant and most targeted. Air breathing fishes, white Featherbacks and Murrells are also targeted. Predators are perceived to be crazy for food in the evening and night.	Income (US\$ 3.5-8/day) and catch (5-15 kg/boat) is high at the advent of flash floods and during summer. Each hook costs US\$ 0.2-0.4; hanging rope costs US\$ 7-9 (longevity 2-3 months).	Housewives and young girls fish with single rod using 'boiled rice' or 'flour paste' and earthworm as baits targeting <i>Puntius</i> spp. for family consumption.

Gears commonly used in the coastal areas				
Small and large mesh drift net ( <i>Illish jal/lakha jal/ koral/ dokkor/ foilla jal/ tong jal/ bata jal/ pathori jal/ current jal</i> <sup>1</sup> )	Unlike any other gear, this gear has undergone transformation revealing the skill and knowledge of the coastal fishers and artisans. The most popular one of its type is a 'Small Meshed Drift (SMD)' net called ' <i>illish jal</i> ', named after the most targeted and widely consumed <i>Hilsa</i> spp. Usually made of 'No. 6 tyre cords' (a recent replacement of much used cotton thread); each piece measures L 35-40m, W 10m, # 2.5-3 inches; 30-50 pieces/boat; operated from 12- 65HP boats at a depth of 6-50m in different targeted fishing spots usually from June to February. This SMD net is conveniently used by clever fishers for encircling shoals when needed. Similarly, 'coral jal' is made of No. 21 twine with 3-4inches meshes. A much known variant of SMD is 'current jal', each piece with L40m, W 15m, # 1.5-2 inches; 25-40 pieces/boat of 12-45 HP. ' <i>Foilla jal</i> ' is a SMD targeting pomfrets; made of No. 4 nylon threads; each piece with L20m, W 40m, # 1.5-3 inches; 25-40 pieces/boat of 25-45 HP.	These gill nets usually target costly fishes like <i>Hilsa</i> shads, pomfrets, groupers, sea bass and many other medium to large sized species. Some wealthy fishers use a combination of SMD and LMD nets targeting a variety of species in different seasons.	Costs for nets/boat vary from US\$ 300-1300 based on weight, types of cords and freshness. Old nets cost 40-50% of the new nets; longevity 3-7 years.	Clever fishers make a combination of horizontal and vertical setting with nets of different meshes to maximize their fishes. Small drift net ' <i>Chandana illish jal</i> ' are widely used in Chittagong coastal belt, targeting small sized <i>Hilsa</i> .
Estuarine & Marine Set Bag Net ( <i>Behundi</i> )	This gear typically exemplifies the special skill of the hereditary Hindu fishers; widely used in the coast and inshore areas of the Bay of Bengal. Muslim coastal fishers have also started to use the gears.	A wide variety of fishes, prawns and crabs in different seasons.		
Hook and long lines ( <i>borshi</i> )	The hook and long lines in the coast is a capital intensive venture compared to those of floodplains. There are around 14-16 crews in a boat (12-13m, 22-30 HP engine) for handling around 5000-7000 hooks. 300 hooks are set in a rope line of 200-250m in hung condition; the rope is fixed with an anchor and a float. The distance between two hooks varies from 60-80 cm. From the main rope the hooks are connected with sub-line of 50-60cm; after each 30 hooks, a small iron rod weighing 200-250gm is hung to ensure proper setting of the hooks and less undulation due to wave action. Voyage period is 5-7 days; hauling time is around 4 hours, 4-6 times of setting/day. Long lines are set at a depth of 6-40 meter; fixed close to bottom at day and nearer to surface at night or in an inclined position in both day and night.	Targets wide ranging fishes ranging from small jew fishes, craokers, groupers, sea bass etc. <i>Hilsa</i> and pomfrets are hardly caught in long lines. Fishers usually continue to operate the gear for 7 months from mid-August to mid-March.	Made of strong 'steel'; shank of the hooks elongated, angular or round depending on targeted species. Costs around US\$ 0.3- 0.5/piece; longevity 3-7 months.	

Key: L-Length, W-Width, # mesh size, CPUE-catch per unit effort, US\$ 1= Taka 65, Source: Participant observation in the fishing villages, 2005-2006.

<sup>1</sup> Paul Alexander (1995) mentioned of the nylon made '*Bible net*' used in Gahavala coast of Sri Lanka; the nets were called 'Bible' as these were adopted from the catholic fishermen from the west coast. 'Current' is used from the perception that the monofilament net attracts/traps/twists fishes like the electricity shocks. In a short visit to coastal town 'Mongdu', Myanmar, I found extensive use of these nets in the *Naf* river, a common river between Bangladesh and Myanmar.

#### Appendix 4: Important rituals observed by caste-based Hindu fishers of the coast

Rituals	Gender dimension	Basic features	Perceived level of risks and remarks
Offerings in the <i>Adinath</i> temple	Usually male crews	<p>Fishers of the 'Thakurtola village' are profoundly influenced by the Adinath temple and the deities therein (<i>Devi Durga</i> and <i>Lord Shiva</i>). All the fishers, ranging from boat-owners to hired labourers, on a sacred day ascertained by the priest, pay tribute to the goddess with some offerings like banana, green coconut water, candles and occasionally flying pairs of pigeons. Once the '<i>puja</i>' or prayer is over, the priest put imprints (divine ashes of fire sacrifice) on fishers' foreheads and then the holy offerings (<i>prosadam</i>) are served. Going through the formalities step by step, fishers get on the boat with their clothes and other daily necessities for final departure towards targeted fishing sites. Together the fishers chant the following '<i>mantras</i>' (hymns) seeking divine blessings and safety:</p> <p><i>'Sormongolamongoille shibe sorbathosadhike, Shoronney tromboke gouri narayoni namastute'</i></p> <p><i>Literal translation:</i> 'Lord Shiva and mother Gouri, (Durga) bestow utmost blessings on us.</p>	In compliance of risk and luck perception; usually observed in a group prior to voyage; observed by caste based coastal fishers only
<i>Shani puja</i>	Usually fishing women	<p>The deity '<i>shani</i>' is worshipped with a view to getting rid of adversity in the sea. It is performed in the early dark night of a Saturday (<i>Saturn=Shani deity</i>). Some of the ingredients described in the <i>Ganga puja</i> section are also needed here. The nice thing with 'Shani puja' is that it is participated by crews as well as the villagers (specially children) for whom a semi-solid offering called '<i>Chinni/ moida</i>' is prepared using flour, milk, banana, molasses, coconut splits, and numerous pieces fruits. To observe the puja, fasting is not compulsory for the crews. It is performed by the priest (<i>Brahmin</i>). After uttering series of associated hymns and incantations, the priest pronounces the prayer:</p> <p><i>'Oum hi hring sree shanischoraie nomo, nilanjonchoy prokkhong rabisuto mohagrahom, chayaya givosambhutom bondevokta shanoiscorom, sreeshanischoraiya nomo osshya sreesanischorstotra mantrashya dasaratha wrishi shonischorow debotatrastupa chonda shanischorapritorthong jope biniyoga'</i>.</p> <p><i>Brief literal theme:</i> We the devotees seek blessings from the mythical Lord <i>Shani</i>; please bestow your blessing on us.</p> <p>After the prayer, the priest melodiously recites a story called <i>panchali</i> describing the blessings of the Lord Shani. Afterwards, food is offered to all participants. Children, with plates in hand, keep waiting for 'holy food' <i>prashad</i>.</p>	Observed by coastal fishers in compliance of high level of risks; rarely observed at household level by floodplain fishers
<i>Mongal chondi puja</i>	Usually fishing women	<p>Performed on the Tuesday evening, especially in the month of '<i>Jaistha</i>' (Late May to mid-June), on a household level by the fishing women for the welfare and safety of their husband, brother or son. The deity is believed to ensure safety and 'good order' for everybody in the sea. Essential ingredients for the puja are mango twig with 5 leaves, <i>horitoki fruit</i> (<i>Terminalia chebula</i>), sugar, rice, water, flowers, fruits, '<i>billyapatra</i>' (leaves of <i>Aegle marmelos</i>), fragrance, and basil leaves (<i>tulshi, Ocium sanctum</i>). The basic prayer is:</p>	Observed from risk and luck perception

		<p><i>'Atong padding hring mongolchondikayei nomo, oum gujjatigujjagontri tong Grihanoshot kritong jopom, siddhirvobotu me debi tot prasadaanmohesshori, Oum sorbamongala mongaillya shibe shorbarthashadike, Shoronney trhomboke gouri narayani nomohostute,</i></p> <p><i>Literal brief theme:</i> The devotees seek blessings from the deity who is connected to Lord Shiva and who ensures 'good condition' for all her disciples.</p> <p>After the prayer, script called '<i>Shanir panchali</i>' is read out melodiously.</p>	
<i>Bipod Nashini puja</i>	Usually fishing women	<p>The deity '<i>bipodnashini</i>' is perceived to mitigate all sorts of disasters wherever and whenever they occur. It is observed at family circle on Tuesday and Saturday evening by fisherwomen who keep fasting for the whole day. The 3<sup>rd</sup> lunar day of the full moon fortnight during the month of <i>Ashar</i> (late June to mid-July) is especially auspicious for this worship. Ingredients are like those needed for the <i>Shani puja</i>. The important part of the hymn is:</p> <p><i>'Kalavrabang kotakkhoirikul voyodang, moulibordhendhu rekhang shonko chokrong kripanong, trishulmopi koroiruddohosting trinetrum, singoskondhadhiorang tribhuban mokhilang, tejoshong puroyonti dhyandurgang joyakkhang tridosho poribrittung sebitang siddhikameyi, oum hring bipottarini urgayei nomo'</i></p> <p><i>Brief literal theme:</i> In a very humble prayer, the devotees ask the goddess with a conch, circular weapon and spear in her hands to protect the devotees and their family members from all sorts of unprecedented adversities. After the worship, an educated woman melodiously reads out rhymed verses called '<i>bipodnashini panchali</i>' which glorifies the bounty and blessings of the goddess.</p>	Observed by women at household level in compliance of high level of risks.
<i>Satya Narayan puja</i>	Usually fishing women	<p>This god is believed to lessen the sorrows and poverty of the devotees; usually worshipped at home on full moon night by fisherwomen following the day-long fasting for the welfare of their family members. Simple ingredients mentioned above are needed. The most important hymn is:</p> <p><i>'Oum nomoste biswarupaiya shonko-chakro-dhoraiocho, padmanavayo debayo Hrishikopotoye nomo, stayanarayanong debong bondehong kamodong shuvong, Liloya bitotong bishong jeno toshimo nomo nomo'</i></p> <p><i>Brief literal theme:</i> In a very humble prayer, the devotees ask the god with a lotus, conch, and a heavy weapon in his hands to bless them with all the good spirit and well-being.</p> <p>After the worship, an educated woman melodiously reads out the story in rhyme called the '<i>satyanarayan panchali</i>'.</p>	Observed by coastal fishing women in compliance of both risk and luck perception.

Source: Participant observations and key informant interviews, 2005-2006.

*Field photographs, Annex 5: Plate A*



*5A1. A group of my key informants during a night-time discussion in Thakurtala fishing village*



*5A2. After a night fishing with the fishers in the Hakaluki haor*



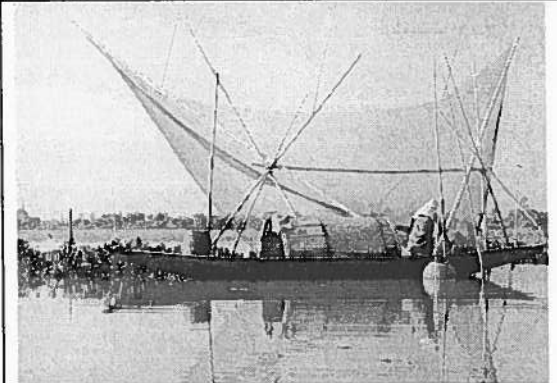
*5A3. A typical coastal fishing boat*



*5A4. A scenic view of the floodplain study village*



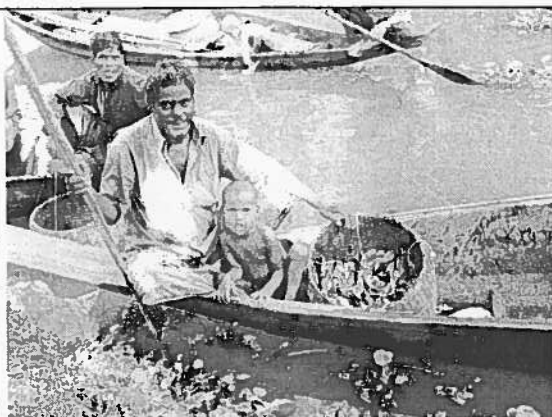
*5A5. A fisherwoman in a good mood for interview when her head-lice are taken care of.*



*5A6. A lift net operated in the haor*



**5B1. Annual meeting of the 'Sarders'. The betel leaves and nuts are served by fishers as a token of respect**



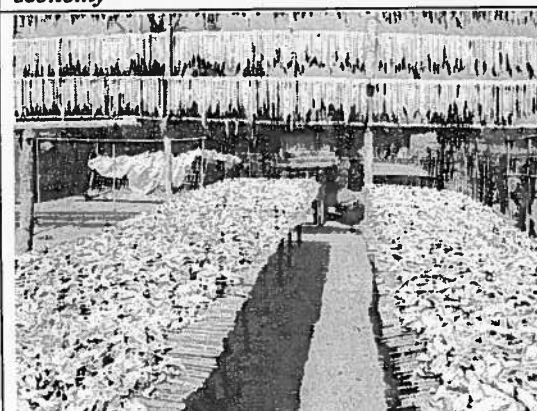
**5B2. Three generations in fishing**



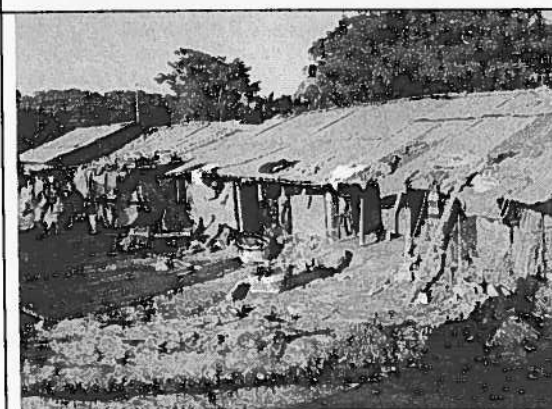
**5B3: Fisher women play distinct role through 'female economy'**



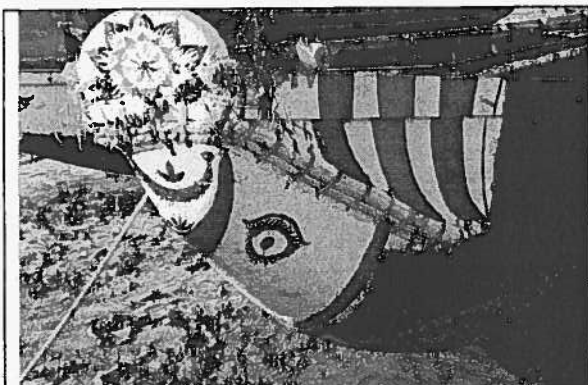
**5B4: Children learn from elders**



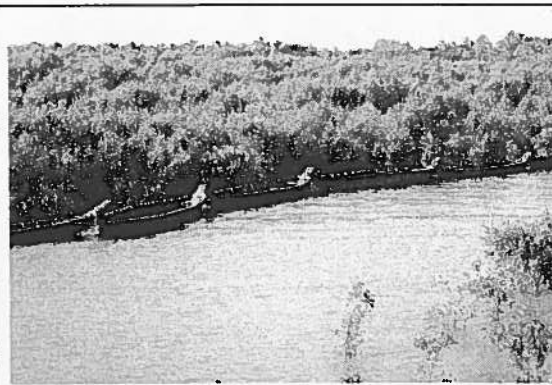
**5B5. Backyard solar drying as an economic activity**



**5B6. Typical coastal fishing village with its shanty character**



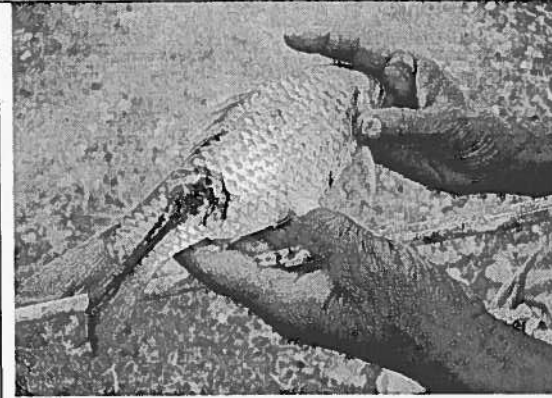
5C1. 'Eyes of Goddess on fishing boat that are perceived to save fishers in the sea



5C2. Mangroves are extremely valuable for coastal fishery and saving human lives



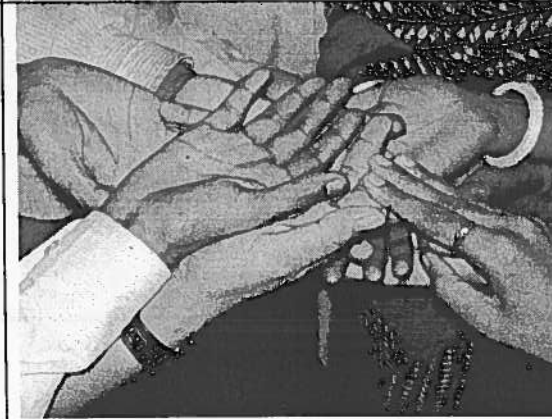
5C3: Large fishes disappear gradually



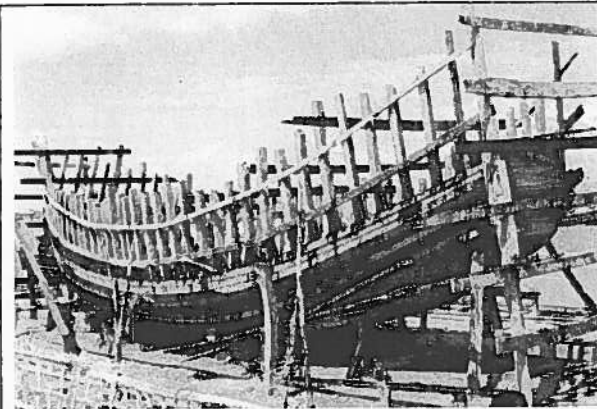
5C4: Infected fish that signals concern over ecosystem health



5C5. Worship in the Adinath temple before sailing for fishing in the sea for 6-7 months



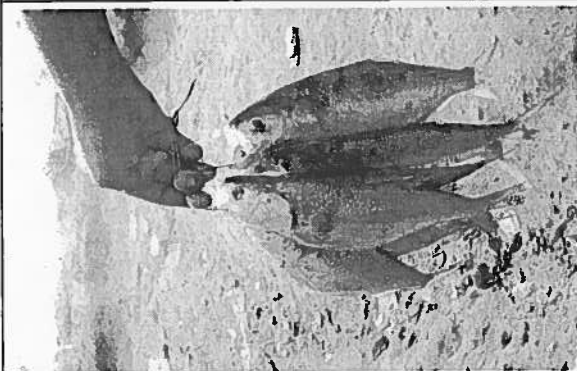
5C6. Leaders of coastal fishing communities promise to work together



**5D1. Broken boat in the coast: Broken livelihood**



**5D2. Victims of moneylending showing documents**



**5D3: Decline in resource base is a big concern**



**5D4: Destructive fishing using almost zero-mesh net in the wetland**



**5D5. A coastal fisher victim of sea borne accident**



**5D6. Shrimp fry fishing: a symptom of livelihood desperation**