

Fachbereich 08: Sozialwissenschaften

Poverty in small-scale fishing communities in Bangladesh: Contexts and responses

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Dedicated to my father Md Nurul Islam

Abstract

This thesis explores the causes of poverty and its manifestation in coastal small-scale fisheries in Bangladesh, the ways in which fishers cope with or overcome poverty, and possible measures supporting poor fishers to escape poverty. In a first approach towards exploring the poverty context, Paper I situates poverty in small-scale fisheries within a wider vulnerability analysis. The paper portrays the livelihoods of small-scale fishers in Bangladesh as being threatened by different factors, such as a rapidly changing and fragile resources base, lack of physical and subjective safety and security, exploitative labour and financial relationships, and social and political exclusion. Consequently, the majority of small-scale fishers in Bangladesh live on the margin of existence, where they are extremely vulnerable to shocks such as environmental disasters. Without any effective buffer against crises, as Paper II identifies, recurring shocks, and ongoing risk exposure are major factors pushing fishers into poverty. As an example, Paper III analyzes the situation of nomad fishers who have been moved from their land and who lead a vulnerable mobile life in search of livelihoods on water. Nonetheless, the fishers constantly attempt to get out of their disadvantaged situation, and in this process they employ a combination of different livelihood strategies, such as income diversification and patron-client relationships. Of the different livelihood strategies, migration is of particular importance: Paper IV shows that migration contributes to the emergence of translocal livelihoods, in which mobility serves not only as a way to escape poverty and vulnerability but also to enhance their capacities and / or to explore new opportunities. Finally, this thesis offers a number of suggestions including both protection and promotion components. To prevent a downward spiral into poverty, several buffers need to be created, for example reducing dependency on fisheries by creating job opportunities in non-fishing occupations. Intervention from the state is also required to minimize risks and free individuals from their lack of freedom, which is rooted in both natural and anthropogenic causes (Paper V). To make their agency effective and to increase the overall capacity and well-being of the communities, an enhanced access to land and education facilities and other socio-economic capitals could lead to an empowerment of poor fishing households and facilitate the participation in the local economic and political process. The study particularly highlights that the contribution of women in income generation and family decision making plays a positive role in accumulation of assets – a way out of poverty for small-scale fishers in Bangladesh.

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A. List of papers included in the thesis

- I. **Islam, M. M.** (2011). **Living on the margin: The poverty-vulnerability nexus in the small-scale fisheries of Bangladesh.** In S. Jentoft & A. Eide (Eds.), *Poverty mosaics: Realities and prospects in small-scale fisheries* (pp. 71-95). Dordrecht: Springer Science+Business Media.

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- II. **Islam, M. M., & Chuenpagdee, R.** (2012). **Negotiating risk and poverty in shock-ridden fishing communities in the Sundarbans mangrove forest in Bangladesh.**

Status: Accepted for publication in *Maritime Studies*

- III. **Islam, M. M.** (2012). **Living on water: Towards sustainable livelihoods of nomad fishers in Bangladesh.**

Status: Manuscript

- IV. **Islam, M. M., & Herbeck, J.** (2012). **Migration and translocal livelihoods of coastal small-scale fishers in Bangladesh.**

Status: Under peer review in the *Journal of Development Studies*

- V. Jentoft, S., Onyango, P., & **Islam, M. M.** (2010). **Freedom and poverty in the fishery commons.** *International Journal of the Commons*, 4(1), 345–366.

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B. Declaration of the contribution to co-authored manuscripts

My contribution to the co-authored papers included in the thesis is as follows:

Paper II: Responsible for fieldwork, data analysis and preparation of manuscript and shared responsibility in conceptualization of research question.

Paper IV: Responsible for fieldwork, data analysis and preparation of first draft and shared responsibility in conceptualization of research question.

Paper V: Responsible for fieldwork and writing the section for the Bangladesh case study and some parts of discussion.

1 Introduction

Globally, small-scale fisheries supply more than half of the marine and inland fish catch (FAO 2010). It is estimated that about 25-27 million people in the developing world are employed as fulltime and part-time small-scale fishers and another 60-70 million people involve in post-harvest activities (BNP 2009). Small-scale fisheries make, significant though poorly quantified contributions as major providers of food to human population, play a very important role in reducing global poverty, thus provide an essential lever to realize the Millennium Development Goals (Jentoft et al. 2011; Pomeroy & Andrew 2011; Heck et al. 2007). Therefore, small-scale fisheries are too large and too important to ignore (Chuenpagdee 2011; Jentoft et al. 2011). However, regardless of the geographical settings, globally small-scale fisheries are susceptible to habitat degradation, overfishing, and overcapacity, conflicts over resources and sites, climate change and variability and also globalization, to mention a few (Jentoft & Eide. 2011; FAO 2010; Pomeroy 2012). Usually, small-scale fishers suffer from living and working in risky environments, with poorly defined rights and representation in policy arenas: they remain poor and powerless and are in a constant struggle for survival in settings beyond their control (Jentoft et al. 2011; Pomeroy & Andrew 2011; FAO 2010). These challenges are particularly evident in the context of Bangladesh. Small-scale fisheries¹ in Bangladesh are instrumental in supplying a cheap and most available source of protein, offering employment opportunities to large number of rural people (Hossain et al. 2006; Islam et al. 2011). Yet, in line with global evidences, participants in small-scale fisheries in Bangladesh experience gross poverty, own limited assets, and live and work in vulnerable and dismal conditions (Rahman et al. 2002; Nabi et al. 2007; Islam et al. 2011).

The poverty-fisheries nexus creates a particular dilemma. Small-scale fishers are often believed to be in a better situation than other rural poor (Eide et al. 2011; Allison et al. 2011a; Mkenda 2000). Products of fisheries (for example, Hilsha species in Bangladesh) meet a high demand and realize high prices, thus generating much wealth (see, Mkenda 2000; Thorpe et al. 2007, for other example). It may seem paradoxical that this sector generates much wealth but a majority of the fishers remain so poor. This is a research question espoused by some researchers in the recent years (see for example, Bavinck 2011; FAO 2005). Unravelling such a conundrum is one of the central focuses underlying this study.

For several reasons, addressing poverty in small-scale fisheries has gained momentum in recent years. First, poverty reduction has become an explicit agenda in resource management (Reardon & Vosti 1995; Macfadyen & Corcoran 2002). Second, the commitment of the international community to address the issue of global poverty has reached an all-time high (Hulme & Shepherd 2003). Third, fisheries have an important

¹ Pomeroy et al. (2009: 419) define small-scale fisheries as ‘coastal near-shore waters’ fisheries. In Bangladesh, coastal small-scale fishers do fishing in waters of less than 40 m depth using both motorised and non-motorised boat. Official recognition regarding this demarcation of the zone was instituted through the Marine Fisheries Ordinance of 1983 (Khan & Hoque 2003).

role to play, in meeting the socioeconomic and human development agenda of the UN Millennium Development Goals (MGDs), particularly the first goal to eradicate extreme poverty and hunger (Heck et al. 2007). Further, fishing communities also offer suitable settings to study the multidimensional aspects of poverty. They do so, because

“Fishing communities represent an ‘unexhaustible mine’ of examples of collective action, decision-making processes, power relationships, social (re)distribution or (re)appropriation mechanisms, and local political competition (for the access and control of the resources and rents generated by these resources) which constitute some of the central themes of research currently addressed through the new agenda on poverty alleviation” (Béné 2003: 968).

Increased attention to poverty in small-scale fisheries is worthwhile, since “(...) a good understanding of the extent, nature, and determinants of poverty is a precondition for effective action to reduce deprivation in fishing communities” (Neiland & Béné 2004: 2). For many communities who are dependent on coastal resources (fish stocks in our case), ongoing socio-ecological changes imply that they need to adapt and innovate or face increased marginalization from the crucial coastal resources (Campbell et al. 2006). Further, till now the responses to support the poor in improving their livelihoods led to limited success due to a lack of understanding about the poor and the nature of their existing livelihoods in wider economic, institutional, political and social context (Campbell et al. 2006; Jentoft & Eide 2011). To respond coastal poverty, Campbell et al. (2006: 275) argue that “we first need to understand how coastal complexity interacts with poverty and how that poverty might be defined.” To realize a similar objective in small-scale fisheries, Jentoft & Eide (2011) argue that:

“(...) we need to *understand* the many dimensions of poverty and vulnerability the political, economic, social, cultural, and ecological *contexts* that small-scale fisheries operate within – and we must learn how people within this sector are *coping*, adapting, and transforming their situation, either for the better or possibly for the worse. These are all basic knowledge requirements before we can start *imagining* a future where small-scale fishing people are free from poverty and vulnerability; and before we can begin *changing* the current state of affairs in order to arrive at that future”(ibid.: 4 [emphasis in original]).

Considering the variety and complexity of interacting drivers that affect fishers’ livelihood and poverty, the multidimensional aspects of their poverty, and the unique setting of every community; it is not possible to find a ‘one size fits all’ policy, which can be easily applied across different contexts (Macfadyen & Corcoran 2002; Allison et al. 2011a). Thus, “poverty must also be understood in its particular local context” (Jentoft & Midré 2011: 46) and effective efforts to alleviate poverty require a sound knowledge of the local realities and the local understandings of poverty in small-scale fisheries (Carney 1999; Allison & Ellis 2001; Andrew et al. 2007; Allison et al. 2011a; Onyango 2011). For efficiency of poverty alleviation program; it is also important to target the causes of poverty first, than the poor people. Because the poor “is a static concept, but poverty is

inherently dynamic” (Krishna 2007: 1956). Consequently “(...) the group of poor people is itself constantly changing. Individuals and households escape from poverty and descend into poverty” (Sen 2003: 513).

Similarly, careful attention to “the minutiae of everyday lives” (Krishna 2010: 5) what he (p. 3) terms as “ground level facts” of the poor is required. Because the poor have their own robust understandings of poverty, and this practical understanding helps them to find out buffers that prevent a descent into poverty or opportunities that help overcome poverty situations. Hence, such understandings constitute an essential qualification for effective policy designs for poverty reduction (Krishna 2010). To realize similar objective in small-scale fisheries, it is also important to differentiate poverty from vulnerability. Poverty and vulnerability are related- but are not the same (Béné 2009; Jentoft & Eide 2011). Hence, the strategies, which seek to alleviate poverty, are not same as those that address to vulnerability reduction (Macfadyen & Corcoran 2002).

This is the approach, the present study proceeds on to understand poverty in small-scale coastal fisheries in Bangladesh. The focus of the research is on how poverty manifests itself in small-scale fishers’ livelihoods and on the fishers’ adaptations to changing social and ecological system. It is particularly important to understand how these coping strategies impact their poverty conditions. This study aims to identify the exogenous and endogenous factors that act as drivers of escape from and descent into poverty. Why and how do fisheries contribute to the well-being of some fishers but not others in the same communities? What are the factors that distinguish successful fishers from other, less successful fishers? Such understanding will help to find out the conditions needed for averting poverty in small-scale fisheries in Bangladesh.

The rest of this chapter is structured as follows: the next section outlines the scope of this thesis. Section three provides a description of the methodology and the study areas. Section four revises the concepts of poverty with emphasis on small-scale fisheries. Section five provides some background information on livelihoods and poverty in small-scale fisheries in Bangladesh. Section six summarizes some major empirical findings and lessons drawn from papers included this thesis. Finally, section seven offers concluding remarks for policy implications.

2 Scope of the thesis

This thesis sets out to study poverty from different perspectives in a number of micro settings of small-scale fisheries along the coast of Bangladesh. To portray a broad view of the poverty situation in small-scale fisheries, all papers included in this dissertation have different- yet related objectives.

Paper I aims at a deeper understanding of poverty and vulnerability, as they are common among coastal fishers in Bangladesh with two main questions. This study asks how poverty and vulnerability manifest themselves in fishing livelihoods. In addition, the

study also identifies how fishers, individually and collectively, cope with poverty and resource crises and, what the conditions are needed for breaking the vicious circle of poverty.

Given that risk and shock are endemic to fishers' livelihoods, particularly in Bangladesh, **Paper II** looks at the risks and shocks faced by various members in the Sundarbans fishing communities. This paper also identifies consequences of these events, on the well-being of affected fishers, as well as their coping strategies. The paper proceeds to look at what factors foster the coping mechanisms of some groups but inhibit those of others; and what can be done to enhance the coping capacity of the latter and to mitigate impacts due to risk exposure and subsequent shocks.

Paper III explores the livelihoods of another fishing group who are nomads living on boats in the central coast of Bangladesh. This paper looks at key issues supporting or hindering the security of livelihood and poverty situation of nomadic fishers, their coping strategies, and also to find out what the conditions are, to create a virtuous circle of accumulation for a route out of poverty.

Paper IV seeks to offer an understanding of the role of migration on the livelihoods of coastal fishers in Bangladesh. The study determines the factors that lead fishers to migrate, particularly the role of poverty and vulnerability in migration decisions; and the effects of migration on poverty and vulnerability reduction. This paper also highlights the importance of migration as a coping strategy, and how emerging networks across space generate forms of translocal households that coordinate their activities over long distances.

Finally, **Paper V** moves beyond the local context, and combines with another context in Tanzania. It calls for a broader concept of freedom (*sensu Sen*) in alleviating poverty among resource users. This paper claims that the root of the tragedy of the commons is the restriction of freedom rather than unlimited freedom. This paper demonstrates how small-scale fishers are in need of a number of entitlements and capabilities, which are essential, for them and their dependents, to enjoy secure livelihoods. It justifies the relevance of Sen's broader concept of freedom as central element of resource governance and poverty alleviation.

3 Methodology and study areas

The empirical part of this research work is informed by qualitative fieldwork and, in certain cases, by quantitative data. The fieldwork was carried out in three periods, split over three years. Qualitative methods employed in this study include observation and interviews. The purpose of my fieldwork was not to count the opinions or the number of people, but rather to explore the range of opinions and the different representations of the issues. The objective was to maximize the opportunities to understand the different positions and views taken by the members of the communities (Gaskell 2000). During

the fieldwork and in the course of analyzing and compiling the data, four ‘must’ elements were kept in mind: First, the researcher must get close enough to the people and situations being studied during a sufficient period of time and under a variety of circumstances to understand what goes on. Second, the information should be factual and describe what actually went on during data collection. Third, information should comprise a pure description of activities and, fourth, should include direct quotations from oral or written statements of interviewees (Lofland 1971).

3.1 Methods for data collections

3.1.1 Participant and direct observations

Observing evidence is often useful in providing further information for understanding the context or phenomenon under study (Yin 2009). Fieldwork in each fishing community was started with an observation of fishers’ livelihoods. This was combined with some informal conversations that helped me to get acquainted with the fishers and their activities. Considerable time was taken to observe the daily activities of the targeted community. Since participant observation offers a distinct opportunity to get a comprehensive and authentic insight into actual situations from someone ‘inside’ (Yin 2009; Gittleston & Mookherji 1997), I did participant-observations by accompanying the fishers to their fishing areas, particularly to observe the shrimp and prawn postlarvae collection activities. I also accompanied them and their catch to local markets or landing sites, to observe price haggling and the setting of marketing channels. All these activities helped me to gain an insight into their daily activities and income, and thereby increase the validity of the collected data.

3.1.2 Interviews

In-depth interview “permits the researcher to explore fully all the factors that underpin participants’ answers: reasons, feelings, opinions, and beliefs” (Legard et al. 2003: 141). Hence, a major part of empirical data was collected from in-depth interviews. The interviewees came from different occupational backgrounds, like fishers (e.g. fish harvester, crab collector, shrimp and prawn postlarvae collector, fishers with or without boat, fish traders), community leaders, fishing entrepreneurs, experts on fisheries issues, and NGO officials working with fishing communities. Key informant interviews were conducted with knowledgeable and interested person in more than one session. The interviews were semi-structured to allow the interviewees more flexibility. Nevertheless, care was always taken so that the interview process did not miss its track, while allowing that flexibility. In the Sundarbans areas, fishers approached me and my research assistant and allowed us to enter their fishing communities, which made data collection easier. In some cases, data collection was challenging, for instance in the Chittagong area, where local fishers were not interested in giving me time and information. Therefore, I had to invest considerable time in finding and convincing fishers to undertake the interviews. Some fishers questioned the benefits of such research for their well-being, citing that many NGOs did such research several times, but that no benefits have yet come. Interview questions were modified, considering the respondents’ understanding of the

questions. Though preference was given to interviewing in the work places or inside the living areas, we tailored our interview time and place to the physical and mental conditions of the fishers and their availabilities, thus avoiding busy working hours. In most cases, interviews were conducted in their work places during periods with less workload. These periods included times when fishers were netting or repairing their boats or nets. Interviews were also carried out in usual places of gathering such as in tea stall. Special caution was taken when interviewing fisherwomen, considering the prevailing norms of each society.

3.1.3 Secondary documents analysis

Secondary documents were collected for information about situations or events that were not covered by empirical investigation (cf. Hammersley & Atkinson 1995). In the Sundarbans region, where a good number of NGOs are working on different pressing issues of livelihoods security of resources users, we went to NGO offices to collect different reports and information regarding local communities. Secondary information was also collected from newspaper reports. These secondary data provided information about different activities taken by the Bangladesh Government and various NGOs working for coastal fishers or associated issues like irregularities and corruption involved in resource management etc. Some secondary documents were also retrieved from various internet search engines. These documents were helpful in collecting background information about study areas and also filling small gaps in empirical evidence.

3.2 Sampling and representativeness

This study does not aim at quantifying social phenomena and drawing representative conclusions. Accordingly, sampling was not aiming at representativeness, but rather at developing a broad understanding of issues at stake. The study areas cover three geographical settings along the coast of Bangladesh (Figure 1). The Sundarbans mangrove forest is in the south-western part of Bangladesh. Ramgati and Mayapara are situated along the central coast. Chittagong lies on the south-eastern coast of Bangladesh. The selected communities differ in terms of religion and caste. Diversity in target species, fishing gear and crafts, and fishing ground were also considered in selecting sampling sites. The sample size of the interviews was determined based on the requirement of information and guided by the principle of data saturation (Polit & Hungler 1999; Glaser & Strauss 1967). Respondents were selected by convenience and opportunity sampling in the communities. Within each community, sampling was mainly carried out in the places where the fishers gather. Fish landing sites, open beaches, or river banks for harbouring boats, flood protection embankments, markets for selling fish, tea stalls, etc. were found as places for fishers' gathering. In addition, I also visited respective places to interview women and men who usually don't move outside of the communities for different reasons such as disability or illness.

3.3 Method of data analysis

In most cases, tape-recorded and hand-written data were transcribed in the evening of the same day, in the field and with the help of a research assistant. Such arrangements

helped to prevent the loss of data as well as facilitated the verification of data in the following morning with the interviewed communities. In case of contradictory information, explanation was sought while in the field or after returning from the field, via telephone. After the transcriptions, contents were analyzed and themes were identified and classified into variables (cf. Spencer et al. 2003) such as the causes of poverty, coping strategies, etc. for further explanation, by using relevant theories.

3.4 Ensuring good scientific practices

3.4.1 Validity and reliability

In designing qualitative research and judging the quality of a research, any researcher should be concern about two important factors: validity and reliability (Patton 2002). Several steps were taken to ensure the validity here. First, interview guidelines were semi-structured but allowed open-ended discussions. The purpose of the interview and research work was described beforehand, so that interviewers were not misguided. Second, as Stenbacka (2001) argues, the understanding of any phenomenon is legitimate if the selected informants are part of the problem of the area, so the study areas were selected carefully to ensure that my research objective addressed the problems of the selected communities. Further, following Stenbacka (2001), all interviewees were free to speak according to their knowledge and perceptions. Nevertheless, I was also careful to identify and stop at the saturation point, where no new information was forthcoming. During the interview process, conversation was tape recorded (where possible), and notes were taken on paper when necessary. To ensure further validity and reliability, transparency and openness was maintained throughout the study period. In each study area, before proceeding to data collection, informal meetings were held with community leaders and elders to explain my purpose and to seek their permission to work with their communities. At the end of the study, preliminary findings were shared with the interviewees for clarification, communication, and cross-checking. The findings of this study and draft articles were presented in PhD colloquiums and seminars at artec and GLOMAR at the University of Bremen, as well as in different symposiums and conferences.

3.4.2 Limitations

Following Islam (2004), conducting interviews have severe limitations in rural Bangladesh. The concept of an interview as a simple encounter between an interviewer and individual respondents is unlikely in a rural community of Bangladesh. The interview mostly takes place in the presence of other men or women who often interfere in the conversation, thus creating a group response. In reverse cases, a respondent might shows little interest or reluctant to give sufficient time for the interview, or even challenge it. Being unhappy with the activities of different NGOs (who usually visit local communities and do different surveys), many people on the coast are not interested in qualitative interviews, as we experienced. Many fishers do not want to share their perceptions in interviews, as they do not trust strangers. On the first hand, some fishers exaggerated their livelihood constraints with the hope that we would provide aid. The

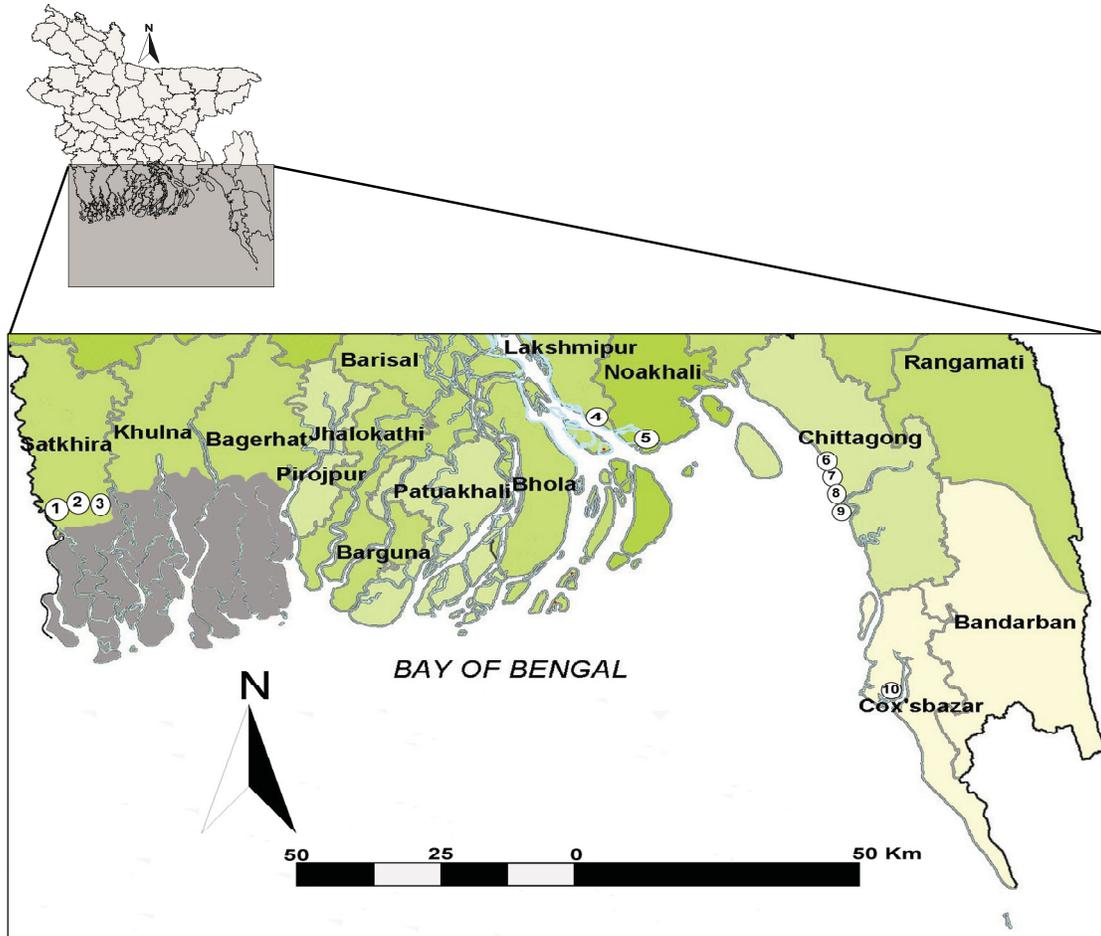
strategy here was to visit them every time and again to build trust. I always performed cross-checking of the collected data. Some fishers declined to record their voices due to suspicion that we might use their voices for other purpose that might harm them. In such cases, some valuable information may have gone unattended during hand writing, carried out by a research assistant.

3.5 Ethical considerations

Ethical behaviour in research work not only protects the rights of the individuals or communities interviewed, but also creates a favourable environment to continue scientific inquiry (Hay 2003). Special caution was taken, considering the sensitivity of maintaining the privacy of interviewees during the interviews and data processing steps. Following Yin (2009), in each interview, I disclosed my intention for data collection and gained verbal informed consent before starting interviews. Any form of deception or any potential harmful activities were avoided in the interview process. Privacy and confidentiality was maintained in all cases so that those participating in the interviews would not be unwittingly put in any undesirable positions. Prior permission was taken before photographic documenting of their activities, work places, or houses. Prior permission was also taken before recording the interview by tape recorder. In cases where no permission was granted, a research assistant took down the interview notes. In all cases, the names of the interviewees were withheld.

3.6 Study areas

The study areas of this research are spread along the coast of Bangladesh (Figure 1). The causes for choosing different sites are multiple. First, choosing different research areas provides a diverse views of small-scale coastal fisheries, which vary considerably, depending on circumstances and places (cf. Jentoft et al. 2011) (e.g. mangrove fishers in the Sundarbans or nomad fishers in Ramgati) along the coast of Bangladesh. Second, long term fieldwork with only one community would not have supported my research objectives of focusing on different research questions in different settings.



1: Mothurapur, 2: Chadipur, 3: Dumurua, 4: Ramgati, 5: Mayapara, 6: Selimpur, 7: Kattali, 8: Ananda Bazar, 9: Katghar and 10: Thakutala.

Figure 1: Location of the study areas (The map is modified from WFP, undated²).

The empirical data of the first paper was collected from three fishing communities. The fishing village of Mothurapur is located in Munshigonj Union³ adjacent to the

² Retrieved and modified from <http://www.foodsecurityatlas.org/bgd/country/availability/agricultural-production> [Access date: 7th April, 2012].

Sundarbans mangrove forest. Fishermen in this community are mostly involved in beach and shore seine net fishing, whereas fisherwomen collect postlarvae of shrimp and prawn as well as perform other manual work. Two other fishing communities were selected from the south-eastern coast of Bangladesh, of which Selimpur is situated in the Chittagong District; and Thakurtala is situated in the Moheshkhali island of Cox's Bazar district. Interviewed fishermen in these two areas mostly use set bag nets, and fisherwomen mainly work as housewives or in fish processing activities (Figure 2).



Figure 2: Women are active in harvest processing activities in Selimpur, Chittagong.

The second paper is informed by fieldwork in the Sundarbans mangrove forest region. In addition to Mothurapur, Chandipur and Dumuria villages were selected. The fishing village of Chandipur is situated in Buri Goalini Union. Most fishermen are involved in beach seine and shore seine net fishing, with some others getting their livelihoods from crab collection and fish trade. Women in this area are mainly housewives. The fishing hamlet Dumuria is situated in Gabura Union. Fishermen in this area collect shrimp and prawn postlarvae, but are also involved in crab collection. Empirical fieldwork for the third research paper was done in a nomad fishing community on the central coast of Bangladesh and data was collected from their settlement on boats in the fish landing site of Ramgati Bazar in Ramgati *upzilla*⁴ of Lakshmipur district. In case of the fourth research paper, the study area of Mayapara is situated in Subarnachar *upzilla* of Noakhali district. Respondents are traditional hereditary fishers who use set bag nets for collecting shrimp and other mixed species of white fish. For this paper, further data was collected

³ *Union* is the lowest level of three-tiered local administration structure in Bangladesh.

⁴ *Upzilla* (sub-district) is the second lowest level of three-tiered local administration structure in Bangladesh.

in migrant fishing settlements adjacent to three fishing communities, Kattali, Ananda Bazar and Katghar along the Chittagong coast. Fishers here are mainly involved in Hilsha fishery⁵. For the fifth paper, data was also collected from these three communities in the Chittagong coast.

4 Theoretical perspectives

4.1 Notions of poverty

Since food is the first priority of any individual, notion of poverty since the 1960s, were mainly based on level of income and/or consumption criteria. However, though poverty and hunger are closely related, but they are not the same. Poverty is not just an inability to meet minimum nutrition or subsistence needs, rather includes a more general material deprivation to keep up with minimal standard of needs in respective society (Béné 2004; Maxwell 1999). As a result, in addition to lack of income, poverty was re-conceptualized later, as the failure to fulfil the basic requirements such as adequate nutrition, clean water, health care, education, housing and other services required to sustain livelihoods (ILO 1976; World Bank 1978, as cited in Misturelli & Heffernan 2010). Today, the notion of poverty is not confined to physical survival and materialistic needs, but also encompasses different social and institutional issues (Misturelli & Heffernan 2010). Accordingly, different concepts such as ‘psychological aspects of being poor’, self-esteem, ‘participation’ ‘rights’ as well as powerlessness, isolation, vulnerability and so forth became visible within the poverty discourses (Misturelli & Heffernan 2010; Maxwell 1999). The result is that- though the concept of poverty remains firmly rooted in the economic criteria - more attention is navigated to non-monetary factors (Sumner 2003).

Sen’s (1981) ‘entitlement theory’ provides a seminal contribution in redefining the concept of poverty (Béné 2004). Sen (1981) observed that people can suffer hunger in the situation of a food surplus, because of the collapse of their means to exert command over food supply, governed by a range of social, economic, cultural, and political factors thus cause ‘entitlement failure’. He explained that the food security of a household depends on its *endowments* meaning the possessions it has (e.g. products, labour) to sell- and its *entitlements* meaning whether it can sell its possession (i.e. the opportunity for exchange) and the price it gets. Thereafter famine and starvation were regarded as breakdowns in the rights of access to food rather than failure of food production (Sen 1977). Again, human well-being is more than ‘economic’, so focus encompasses on human capabilities. According to Sen (1999) capabilities are directly related to the freedom for making meaningful choices that improve human well-being and means of development. This notion of ‘development’ finds its expression in “the removal of

⁵ Hilsha (*Tenualosa ilisha*) is the national fish of Bangladesh (Figure 7). Its fishery constitutes the single largest capture fishery in Bangladesh in terms of annual catch and employment. It contributes about 13-14% of the annual total fish production in Bangladesh, employing about 0.45 million people of which 32% are full time and 68% are part time fishers. Another 2-2.5 million people are involved in marketing and other ancillary activities related to Hilsha fishery. It also contributes about 1% to the GDP of Bangladesh (Department of Fisheries, 2005).

various types of ‘unfreedoms’ that leave people with little choice and little opportunity of exercising their reasoned agency” (Sen 1999: xii). This perspective warrants attention to both, individual agency and the social processes that foster or constrain freedoms (Glavovic 2008).

To sum, “(...) peoples’ poverty is characterized not only by material deprivation but by the denial of basic human rights: to natural and social resources such as land and education, to participate in the decisions which affect their lives at the households, community, national and international levels, and to freedom from the discrimination and oppression which prevents people from making a living in peace” (Eade & Williams 1995: 481). Under the rights-based approach, a multidimensional approach to poverty reduction should employ the key strategies of promotion and protection of economic, social, cultural, civil, and political rights (Béné 2003). To add this proposition, the importance of ‘giving a voice’ to the poor is also emphasized (DFID 1997; Narayan et al. 2000).

4.2 Conceptual issues of poverty in small-scale fisheries

4.2.1 Old paradigm of poverty in fisheries

Poverty and deprivation have long been recognized as very pervasive and almost endemic to small-scale fisheries of the developing world (Panayotou 1980; Cunningham 1993, as cited in Béné 2003; Béné 2004). Summarizing the literature; Béné (2003) in his widely cited article demonstrates that the empirical studies on poverty in fisheries are heavily inclined to the ‘old paradigm’ that equates fisheries with poverty. Béné (2003) encapsulated two lines of reasoning in poverty research that support the old paradigm, both strongly conveying the idea of structural reasons for poverty in fishing communities (Béné 2003, 2009; Mills et al. 2009). The first pillar assumes that fishermen ‘are poor because they are fishermen’ and is explained as the ‘*endogenous*’ origin of poverty in fisheries, where fisheries are seen as a type of common pool resources (CPR). With open access regimes increasing numbers of people keep entering into fisheries- leading to the economic (and possibly biological) overexploitation of the resources - consequently diminish profits and impoverish the fishing community (Béné 2003; Smith et al. 2005). The second pillar, with the presumption that ‘they are fishermen because they are poor’ is referred to as the ‘*exogenous*’ origin of poverty in fisheries. Following this argument, the roots of poverty are in the economic situation outside the fisheries. The open access fisheries serve as a safety valve against shocks for poor people who have lost their livelihood options in other economic activities (FAO, 2000; Béné 2003). Thus, poor fishers are often already poor before coming into fishing occupation (Dunn 1989).

4.2.2 New dimensions of poverty in small-scale fisheries

In fisheries, though different economic criteria (fish catches, standard of housing, land ownership, capital investments, household debt burden, etc.) dominate in poverty discourse, however, different social attributes (such as literacy rate, access to education, health and other basic services) as well as social manifestations of poverty (such as power

relations) now also included in poverty definition (Thorpe et al. 2007). Hence, Macfadyen & Corcoran (2002) conclude that fisher's poverty is not a one-dimensional phenomenon, rather a multidimensional issue with many faces, of which lower income is only one factor (Thorpe et al. 2007; Béné 2004). Poverty is thus constituted through of a number of other factors such as 'capabilities', (e.g. health, education, and nutrition etc.), vulnerabilities, political empowerment (Walmsley et al. 2006; Béné 2004; Thorpe et al. 2007). Béné (2003) identifies four categories of discrimination, namely economic exclusion, social marginalization, class exploitation, and disempowerment. These discriminations may deny or restrict individuals' or groups' command over resources that in turn considerably lead to the impoverishment of fishing people.

As shown in (Béné 2003), the poor fishers may suffer economic exclusion because of their financial inability to get access to productive assets that are necessary to enter and/or operate fishing activities. Fishers' access and use of a resource might be denied due to their social status based on caste, gender, or ethnic origin etc. Poor fishers may be exploited by a higher class who, as a patron, may extract surplus labour from a (lower) working class of fishers (as his client). Similarly, fishers may be exploited, when 'lower' class is considered as not receiving its 'fair share' of the rent generated from fishing activities. Disempowerment is another dimension of impoverishment in fishing communities. They are politically disempowered due to muted voice. They also suffer psychological disempowerment because of the internalized sense of worthlessness and subordination to more powerful authorities (Friedmann 1996). This sense of defencelessness also exemplifies the vulnerable situation of small-scale fishers.

4.2.3 Small-scale fishers: Poor or vulnerable?

The slipping into poverty is often extremely rapid (Baulch & McCulloch 1998; McCulloch & Calandrino 2002). Households and individuals constantly fall into and escape from poverty (Sen 2003). This implies that it is very important to distinguish between those who are already poor and those who are vulnerable to poverty. We understand vulnerability as "the state of susceptibility to harm from exposure to stresses associated with environmental and social change, and from the absence of capacity to adapt" (Adger 2006: 268). The link between poverty and vulnerability is explained by Dercon (2001:5) as:

"Well-being and poverty are the ex-post outcome of a complicated decision process of individuals and households over assets and incomes, faced with risk. Vulnerability to poverty is the ex-ante situation, i.e. before one has knowledge of the actual shocks that will occur. Vulnerability is determined by the options available to households and individuals to make a living, the risks they face and their ability to handle this risk".

Like poverty, vulnerability is also multidimensional, and may be social and institutional at its origin. Poor fishers are often defenceless against abuse by the more powerful parts of society; socially higher-ranked people are often able to take advantage of the weaker position of fishers and the state is unable or indifferent to protect them from abuse

(Jentoft & Midré: 2011). Thus, poverty is about want or deprivation, vulnerability refers (sensu Sen 1999) to a lack of “protective security” (Jentoft & Midré: 2011). It has also been argued that the connection between poverty and vulnerability works in both ways (Amarasinghe & Bavinck 2011). For instance, poverty is one of the factors that make fishing people vulnerable, as it affects their capacity to cope with uncertainties and shocks. On the other hand, vulnerability may causes deprivation – thereby creating poverty (Jentoft & Midré 2011; Amarasinghe & Bavinck 2011). However, this correlation is not systematic (Béné 2009) - chronically poor may not be highly vulnerable (McCulloch & Calandrino 2003) and the non-poor may not necessarily be the less vulnerable (Moser 1998).

Even so, fishing people are more prone to poverty because they are more vulnerable and thus vulnerability is a central issue in the livelihood of coastal fishers in many parts of the world (Béné 2006; Thorpe et al. 2007; Salas et al. 2011). Those fishers may not necessarily be the poorest of the poor in monetary terms, but may instead be amongst the most vulnerable socio-economic groups (Béné 2003; Allison & Horemans 2006). Hence, for effective policy formulation, it is necessary to go

“(…) beyond the static vision of fishers as being the ‘poorest of the poor’ where poverty is considered as a chronic status reflecting essentially low endowments and low returns to these endowments, towards a more dynamic vision where ‘poverty’ is understood as a conjunction of these chronic factors combined with a particularly high vulnerability to shocks and external changes” (Béné 2009: 927).

The present study also particularly focuses on risks and shock and their relation to poverty and vulnerability. Though vulnerability is not synonymous to risk, both concepts are related. While risk is about exposure to external hazard over which people have no or limited control, vulnerability conceptually includes also the capacity to manage such risks without suffering damaging or socially unacceptable loss of well-being (Dercon 2006; Chambers 2006; Hoogeveen *et al.* 2004; UNDP 2007).

5 Livelihoods and poverty in small-scale fisheries in Bangladesh

The fisheries sector of Bangladesh is broadly categorised into three sub-sectors: i) Inland open water bodies (for capture fisheries), ii) Inland closed water bodies (for aquaculture), and iii) marine waters (offshore industrial and coastal small-scale fisheries⁶) (Alam & Thompson 2001). The inland fisheries of Bangladesh are among the most productive and diverse in the world, as about 11 percent of global inland fisheries production comes from Bangladesh (FAO 2010). It is estimated that more than 70% of the population of Bangladesh lives in the flood plain, river banks and coastal areas, with access to fish and aquatic resources as exploitable natural capitals (Hossain et al. 2006). During monsoon, almost two-thirds of all Bangladeshi rural households get involved in fishing in the water bodies of floodplains (BNP 2009). The small-scale fisheries in Bangladesh employ over 2 million professional fishers many of them from the poorest part of society (Hossain et al. 2006).

However, both inland and coastal fisheries face several challenges such as over-fishing and severe resource degradation. Several causes contribute to fisheries resource degradation such as construction of roads and embankments, drainage and flood control structures, the use of pesticides and fertilizers, pollution, construction of dam in upstream parts of the major river together with natural siltation. Furthermore, increasing population, climate change and variability, as well as rapid urbanization are also imposing rapidly growing pressures on aquatic resources (Hossain et al. 2006; Rashid 2005; Alam & Thomson 2001). In addition, weak implementation of outdated policies is another cause that contributes to the deterioration of the fisheries resources of Bangladesh (Ali 1997). In this situation, a vast majority of small-scale fishing communities in Bangladesh are confronted with more or less similar challenges (e.g. poverty, degraded fisheries resources) that put obstacles in their way towards sustainable livelihoods (Rahman et al. 2002).

Among the other challenges, social and economic exclusion sometimes cause the denial of access to common property fishing grounds. In this common property fishing grounds, locally called *jalmohal*, traditional poor fishers are denied access because the water bodies have been leased to powerful rich, and in most cases, non-fisher leaseholders (Rashid 2005; Toufique 1997; Islam et al. 2011). In this exclusion, power relations play an important role, where the powerless, poorest fishers often have to leave their fishing rights to the powerful elites who have established a strong position in the local administration structure and political parties (Toufique 1997; Rashid 2005; Islam et al. 2011). The centralized management approach of leasing public water bodies to private non-fishers lease holders puts restrictions on the rights of access or fishing entitlement of poor rural fishers and likely to continue or increase their poverty (Islam et al. 2011; Hossain et al. 2006).

⁶ The Sundarbans mangrove forest has two basic types of fisheries, namely inshore and offshore fishery. Inshore fishery is done by small non-mechanized boats (5-12 m length) in relatively shallow waters, ranging from depths of 2 to 8 meters within or adjacent to the mangrove forest. Offshore fishery covers both estuarine areas and coastal waters (Hoq et al. 2003).

In the Sundarbans region, where communities are highly dependent forest resources-class exploitation is particularly evident. The expansion of coastal shrimp farming, at the expense of agriculture, and mangrove destruction has led to negative environmental and socio-economic impacts (Islam & Wahab 2005; Hoq 2007). Influential elites, mostly from outside invest in large-scale shrimp farms in the coastal areas of Bangladesh (Ito 2002; Gain 1995). With monopoly capital and power relations these ‘shrimp-lords’ have displaced the landless people or small land owners from the coastal areas (Ito 2002). Many dispossessed people either migrate out of the area or are forced to accept a poor life style, and resort to destructive fishing or move to the forest for a livelihood option (Islam & Wahab 2005). Consequently, a few people, mainly from outside area gain the benefits, while great shares of the local population are dispossessed and marginalised (Gain 1995). To feed the expanding shrimp aquaculture, about 0.42 million people (mainly women and children) in Bangladesh are involved in shrimp and prawn postlarvae collection from wild sources (USAID 2006; Azad et al. 2007). With high by-catch rates, shrimp and prawn postlarvae collection activities contribute to the colossal losses of biodiversity (Ahmed et al. 2010; USAID 2006). These collectors are mostly poor as their little earnings are insufficient to move them out of poverty (Ahmed et al. 2010; Azad et al. 2007). In sum, a majority of small-scale fishers are poor, and generally possess limited assets, and without any viable alternative options their livelihoods are crucially dependent on access to fisheries resources (see also, Rahman et al. 2002; Islam et al. 2011).

6 Summary of research findings of the papers

This chapter highlights some of the main findings of research papers that are presented in this thesis, which then relate to the overarching aims and objectives of this study. This chapter shows how poverty and vulnerabilities manifests themselves in the livelihoods of coastal fishers, how the exposure to different shocks makes them vulnerable to poverty, and the coping strategies adopted by fisher folks. The next section is followed by a description of the conditions that are needed to reverse the downward spiral of poverty and provide a way out of poverty.

6.1 Understanding poverty in coastal small-scale fisheries-based livelihoods in Bangladesh

Sustainable livelihoods require a sufficient and steady flow of income, and year-round food security for consumption (Smith et al. 2005). Insufficient income is a major driver that perpetuates poverty in small-scale coastal fisheries in Bangladesh (e.g. shrimp and prawn postlarvae collectors in the Sundarbans, Figure 3). Declining fish stocks are obviously a major cause of poor income. However, fishers are not able to reap the benefits of the remaining stock, due to seasonality or interrupted fishing. The seasonal rhythm of stock and seasonal fishing ban seasons interrupt fishing incomes during the year (Paper I-III). Fishers are also forced to discontinue fishing due to rough weather, caused by low depression or tidal surges during the monsoon season, or criminal activities by dacoits that make fishing operation risky (Paper I-V). This seasonality or interruption in fishing operation causes a variation in fishing activities, income and food

security (cf. Smith et al. 2005). Thus, in line with Narayan et al. (2000) findings, interviewed poor fishers emphasize their material deprivation such as food, homestead land, fishing gears and other assets that they need to meet their basic needs (Paper I & II).



Figure 3: In the Sundarbans, women and children are mainly involved in shrimp and prawn postlarvae collection.

Even after the seasonal rhythm in fishers' incomes, a majority of fishers still can earn better than other poor non-fishers as long as they have productive assets e.g. fishing gears and access to fisheries (Paper II & III). Nevertheless, though fishers are not always among the poorest of the poor in terms of income, a majority of them is found so, on all other criteria of poverty, such as mass illiteracy, poor health and nutritional standards, severe geographical, political and social isolation, as well as their vulnerable conditions (see also Willmann 2004; Jentoft & Midré 2011; Béné & Friend 2011). Fishers are not only in deprived in their capabilities but also vulnerable to shocks.

Living in vulnerable situations-small-scale coastal fishers in Bangladesh face unsettling shocks that are numerous, severe, and widespread. The major shocks come from: repeated poor catch or harvest failure over a long period of time, tiger attacks in the forest, cyclone damages to houses and/or productive assets, dowry claims during daughter's marriages, an illness of family members, and in the worst case, death of income earners (Paper I-III). The exposure to different shocks often drains out the earned income of fishers (Paper II) and this shock exposure is one of the profound causes of poverty (Paper I & II). This risk exposure and subsequent shocks take toll on the poverty situation in small-scale fisheries, because of fishers' insufficient capacity to manage the risks (Figure 4). In fact, vulnerability is the central issue when studying

poverty and livelihoods in small-scale fisheries of Bangladesh (Paper I). Some fishers, who may not be poor today, but their livelihoods or the social and natural environment that shape them, may already have a high risk to slip into poverty (Nabi et al. 2007).

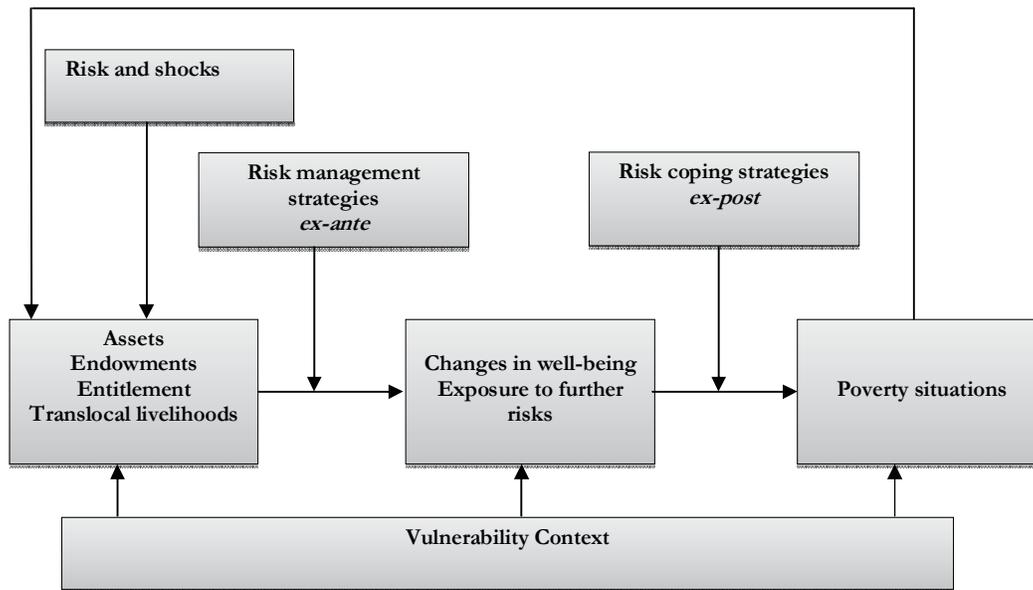


Figure 4: The role of risks and shocks for poverty situations of small-scale coastal fishers in Bangladesh.

The majority of fishers are found to live on the coast in a rather hostile physical environment, many of them on government owned *kebas* land, in congested shanty settings; nomad fishers live on boats (Figure 5). These settings are risky and with limited basic service (cf. Narayan et al. 2000). Weather-related disasters such as cyclones or coastal storms regularly wreak havoc in the communities and destroy their lives and assets (Paper I-II). Further, the geographic isolation of fishing communities have further impacts on their poverty and vulnerability status and it is a factor that limits their access to development assistance but make them more vulnerable to natural disasters (Salagrama 2005).

However, in some cases poor fishers are themselves responsible for their precarious conditions. For example, fishers are notorious for their extravagant behaviour and alcoholism, which is a major cause of poverty (Salas et al. 2011; Bavinck 2011; Paper I). Even after having the means to avail sanitation, the majority of fishing households still lacks water sealed toilets, which exposes them to the risk of water borne diseases (Paper I-II). Even better off households could risk bankruptcy, as they have to sell assets, e.g. to meet the treatment costs of illnesses. They are living in a vulnerable condition that Krishna (2010: 17) terms as “only one illness away” from poverty. In the absence of viable alternative occupations, most small-scale fishers also depend on a single fish species such as Hilsha species, which bears the risk of a serious livelihood failure in case of a stock failure (Paper I, III &V). In absence of any effective buffer to fall back on, the

majority of fishers are forced to adopt strategies which are available and cost them least. Some coping mechanisms run the risk to make them further vulnerable by depleting the resource base they depend on. For instance, the use of monofilament gill net and catch juvenile species Hilsha fish is blamed for reduced production of adult Hilsha fish (Paper III; Hoq 2007).



Figure 5: Nomad fishers living on boats are one of the most vulnerable fishing communities in Bangladesh.

Even so, the majority of small-scale fishers agree that income from fishing may not be too much, but can be sufficient to maintain their livelihoods above the poverty line. As long as fishers have the capacity to fish and can get and protect their fair share without exploitation and disturbance by outside actors, they can beat poverty (Paper II & III). Accordingly, command over the access to resources and the ability to protect income from dissipation by illegal or unfair processes are a major determinant of their poverty situations. Following Béné (2003), four ‘socio-institutional’ discrimination processes may restrict individuals’ or groups’ command over resources that perpetuate poverty in fishing communities in Bangladesh. The fishing profession has been considered as a ‘lower job’, given its lineage to lower-caste professions, and fishers are excluded from mainstream society in several veins (Paper II & IV). They are subjected to different forms of exploitation that determine their access to fisheries, which reduce their earning capacities. For instance, in the case of the Sundarbans area, income from fishing is dissipated by illicit acts, such as ransom demand by dacoits and bribery by forest officials. Poor fishers explained that they are mistreated by criminal gangs, and they have limited capacity to protect themselves or seek protection. In the Sundarbans, the powerful people can often set their estuarine set bag nets in more productive parts of the rivers, displacing the poor ones. In the Chittagong coast, *Faar* for fishing is maintained by local

traditional fishers, where newcomer migrant fishers have no access. “(...) removing freedom of access to the fishery commons is tantamount to confiscating the only entitlement that poor people have to sustain themselves” (Jentoft et al. 2011: 455) and thereby creates inequity and social injustice (Kolding & van Zwieten 2011). Social exclusion is particularly evident in case of migrant fishers in Chittagong and in case of ‘tiger widows’ in the Sundarbans (Paper II & IV). In addition to the denial to *Faar*, migrant fishers lack access to basic services, educational provisions (Figure 6) and face conflicts and exclusion from participation in social and political processes (cf. Njock et al. 2009). So, overall small-scale fishers are victims of abuse, either from forest officials, criminal gangs, middlemen, or others who do not refrain from exploiting fishers’ weaker position.

Economic incapacity to participate in income generation is another entitlement failure. Many fishers are poor because they cannot maximise their fishing skills by investing in productive assets (for instance, in the cases of fisherwomen who use drag nets to collect shrimp and prawn postlarvae in the Sundarbans or poor nomad fishers in Ramgati). The lack of economic capital inhibits fishers from buying efficient or different sets of fishing gears for overcoming seasonality or pursuing more rewarding fishing practice. Land is one of the most important assets in rural Bangladesh (Hye 1996). Poverty among small-scale fishers is often associated with lack of land ownership (González 2011; Nguyen & Flaaten 2011). The landed fishers can use land as other sources of income and allows them to switch between activities according to availability and seasonality of fish stock (cf. Jentoft & Midré 2011), as an ‘exchange entitlement’ (Sen 1981; Paper I). Thus, land possession acts as buffer against seasonality and act as collateral assets. It is evident that households who have some agricultural land (‘investment capital’) are better diversifiers than landless fishing households (Paper I). For landless poor fishers, the lack of collateral assets limits their access to bank loans, and therefore forces them to go to moneylenders. This economic ‘bondage’ ties poor fishers to a long-term exploitative relationship with local moneylenders. Such persistent indebtedness to the traditional credit system binds fishers to their occupation and to the ‘the related of sense of subcultural identity’ (Ruddle 1994: 68). In addition to these predicaments, paying ransom and protection money to criminal gangs not only drains fishing incomes, but often puts fisher households in debt. Such subjugation is partly rooted in their political disempowerment and lack of protective security, what Sen (1999) considers a basic ‘instrumental entitlement’.

Poor fishers are disempowered, partly because they are unorganized and their political voices are muted. Lack of representation in the political process is particularly felt by poor fishers in terms of getting access to public services and the procurement of benefits during ban seasons. The Government of Bangladesh provides food rations during the ban season of Hilsha fishing. Selecting the beneficiaries often involves nepotism and corruption. Eligible fishers are sometimes excluded and non-poor fishers, even non-fishing people, manage to get food rations using their connections with local administration officials or political parties. In several cases, the poorest fishers are deprived of any food rations (Paper III). As a result, without fishing income and any assistance from the state to overcome no-fishing seasons, they have to face extreme

hardship and are forced to build patron-client relationships with money lenders to ward off food insecurity. In the face of income loss, the poor people need surplus accumulation to compensate for a loss, but availing that opportunity requires ‘room for manoeuvre’ (Jentoft & Midré 2011; Clay & Schaffer 1984), which poor fishers simply do not have. As mentioned before, their ‘room for manoeuvre’ is also restricted due to certain social relationships such as caste structure and gender relations (cf. Borooah 2005; Cleaver 2005).



Figure 6: Migrant fishers’ settlement in the Chittagong coast with limited access to basic facilities.

Poor organization and fragile institutions are other dimensions of vulnerabilities that leave poor fishers without bargaining power or any buffer. Thus, they become defenceless against any mistreatment, for example by middle men (Jentoft et al. 2011). Consequently, they are put in the position of a class-exploited group. There is the potential to avert poverty in small-scale fisheries, as fish is a highly priced product in comparison to other agricultural products in Bangladesh. But fishers are impoverished because they do not get a fair share of their products due to their weak bargaining power and debt bondage with middle persons. For instance, in the case of Hilsha species, fishers only get 1.5% of the final consumer price (Ali 2010). Fisherwomen are even more exploited: although they are very instrumental in income generation and in adopting multiple strategies. Gender relations in fishing households are “troubled and unequal” (cf. Nayaran et al. 2000: 2). Women suffer social discriminations that generate gendered poverty (Paper I-III). Particularly, certain shocks create social exclusion of women, as in the case of the ‘tiger widows’, which posits them to further risk of getting into poverty. Women are vulnerable to poverty, not only because of their social status, but also because of their role as ‘shock absorbers’ (Mendoza 2009). As a major factor for

descending into poverty, more than 90% of the interviewed households are found to pay dowries either in cash money or in-kind.

6.2 Coping versus asset accumulation: What differentiates fishers' capacity to get out of poverty?

In the face of crises, fishers resort to different coping mechanisms (Salagrama 2006). The strategies that small-scale fishers in Bangladesh adopt include adjusting consumption, developing multiple and diverse economic portfolios, switching target species, removing children from school and putting them to work, creating a family network by sharing responsibilities, taking loans from relatives or money lenders, forming patron-client relationships, increasing pressure on CPR through unlawful means, seeking assistance from outside as relief, or migration to form a translocal livelihood over spaces.

Though the majority of fishers are exposed to more or less the same extent of shock and vulnerability, there is a significant difference in the ways they cope, that strongly depends on assets and endowments. Like in many other settings, there are fishers who live on marginal subsistence; others are able to earn a comfortable income, and few better off fishers are able to save considerable sums (Firth 1946). In a similar way, livelihood strategies differ considerably between rich and poor households (Giesbert & Schindle 2012). The poor fishers usually take a less profitable and more defensive strategies, just to continue livelihoods but with very narrow scope for assets accumulation (cf. Zimmerman & Carter 2003; Giesbert & Schindle 2012) but better off fishers have another set of choices at their disposal that, in some cases helps them to overcome the crises, but in other cases also enables them to accumulate assets. Empirical evidences presented in the papers suggest that some fishers are able to elevate or maintain their income, ward off seasonality, and spread risk by switching target species, and/or by using different fishing gear (Paper I-III). For them, good income from Hilsha (Figure 7) or crab fishing is a key factor in getting them out of poverty.



Figure 7: Hilsha fish (*Tenualosa ilisha*) constitutes the largest and most important fishery in Bangladesh and a key factor for getting fishers out of poverty.

Similar differentiation is also visible for migrant translocal households in Chittagong and Noakhali regions. Temporary migrants in Chittagong have been generally found to have difficulties using remittances for a long-term improvement of their situation. Thus, for this group of migrants, the translocality of their households basically works as a buffer to fall back during the period of crises, but does not facilitate a continuous improvement of the economic situation. Long-term migrants with supplementary income sources are generally better situated and are able to put income aside for future investments with poverty-averting potential. The majority of these better off fishers are found to convert their fishing income into buying or mortgaging land to collect a number of material benefits (such as loans from the bank), and non-material benefits (such as access to social networks) that further strengthen their resilience. Better off fishing households are often found to have strong social ties to local elites and influential persons involved in politics, and having such social networks is a lever for drawing benefits from state and common pool resources, and making better use of available opportunities (cf. Rahman et al. 2009; Lewis & Hossain 2008); ultimately, those households are able to generate higher incomes (cf. Narayan 1997). Better off fishers allocate more investments into non-fishing alternative activities on land such as trade, service, migration (remittance), and non-fishing labour (cf. Sen 2003).

6.3 Ways out of poverty in small-scale fisheries in Bangladesh

The World Development Report 2000 (World Bank 2000: 33) proposes a framework of actions to counteract poverty, built on three equally important areas: First, it advocates for promoting opportunities by “expanding economic opportunity for poor people by stimulating overall growth and by building up the assets of the poor and increasing returns on these assets through a combination of market and nonmarket actions.” Second, it targets at facilitating empowerment by “making state institutions more accountable and responsive to poor people, strengthening the participation of poor people in political processes and local decisionmaking and removing the social barriers that result from distinctions of gender, ethnicity, race, and social status.” The third one aims at enhancing security by “reducing poor people’s vulnerability to ill health, economic shocks, policy-induced dislocations, natural disasters, and violence, as well as helping them to cope with adverse shocks when they occur”.

These strategies are certainly related in the cases of poor coastal fishers in Bangladesh and can broadly be categorized into protection and promotion components as we discussed in Paper II. It is important to enhance fishers’ capacities by providing different sets of choices for their livelihoods, which will help to increase their income, or employment opportunities to escape from poverty. In addition to promotion policies, protection policies are required to create buffers to prevent a descent into poverty, by reducing the exposure to risks and uncertainties (Matin & Hulme, 2003; Béné 2009; Krishna 2010). The both policies prescribed above are, in some cases intertwined and reinforce each other. For instance, access to formal credit schemes will not only protect households from exploitation by money lenders, but will also promote the income generation through investments in productive assets.

First and foremost priority should aim at sustaining the fishing income. Given that most of fisheries stock in the Bangladesh coast are overexploited, for instance Hilsha (*Tenualosa ilisha*) and mud crab (*Scylla serrata*) in the Sundarbans (Hoq 2007), there is a clear need to raise incomes in ways that do not necessarily put additional pressure on heavily exploited fish stocks. In particular, poverty in fisheries may be alleviated if incomes are distributed more equitably (Jentoft et al. 2011; Eide et al. 2011). Fish marketing channels often disfavour small-scale fishers from getting appropriate prices. They need support to derive increased benefits without increasing fishing efforts, through measures that improve value-addition in the market chain, reducing fishing costs, or increasing fishing efficiency (Allison et al. 2011b).

In our context, protecting the fishing rent from illegal or unfair rent seeking activities (by forest official, middleman or criminal gangs) will also increase fishing income, as a majority of fishers interviewed in this study perceive it. These measures will take pressure off the fisheries and help avoid illegal fishing. To facilitate the more equitable distribution of fishing rent, it is important to cut down intermediates middle men in the marketing channel by an appropriate infrastructure and more integration into marketing and credit facilities.

With increased efficiency and increasing fishing income, there is also a need to reduce the number of fishers in order to sustain overall exploitation rates (Charles 2001, as cited in Allison et al. 2011b). Several interviewees (Paper III) recognize the increase in the numbers of coastal small-scale fishers in Bangladesh over the last decades. Alternative occupations need to be created not only for poor fishers, but also for other coastal poor people who come to fisheries as the last resort. Salmi et al. (1998) find that sustainability of fishing activities is connected to the availability of alternative employment opportunities. Considering social and economic implications, overcapacity need to address by creating alternative opportunities, by gradually reducing the number of fishers rather than removing all at once (Pomeroy 2012).

Fisherwomen could be better candidates for job diversification due to their risky positions in job setting and experiences in pursuing multiple jobs. Shifting occupations of fisherwomen from fishing (notably, environmentally destructive shrimp and prawn postlarvae collection) would help to alleviate pressure on the fisheries resources and also to reduce the high dependency of entire households on vulnerable fisheries and uncertain incomes (cf. Takasaki et al. 2004). However, fishing skills cannot easily be converted into other skills to get alternative occupations. Thus, it is necessary to generate opportunities for fishers by improving their skills, (Paper I-V; Salas et al. 2011). Particularly, female education or education of the head of household has strong positive effects on asset accumulation, such as in case of women working in the textile industry in Chittagong (Paper I & IV). Preventing the continuation of poverty through the avoidance of school drop-outs is another priority concern. Since the eradication of child labour from fisheries is not possible over months, special schooling hours need to be devised for working children. Human capital development in the form of improved access to health and education services to raise productivity and skills and increase livelihood opportunities could be effective in reducing household vulnerability to risks and shocks (Devereux et al. 2006).

Availability of institutional credit is another condition to diversify the livelihoods base of small-scale fishers (Jentoft et al. 2011; Nguyen & Flaaten 2011). Providing credit to fishers will help to break monopolistic relations with money lenders. Fishers need credits to stand on their feet, after sudden events have destroyed their asset base. Further, as a bankable asset, ownership of land (at least homesteads) is an important buffer and vehicle in getting access to formal credit markets and other different opportunities (Paper I-III). Particularly for nomad fishers, livelihood sustainability is linked to transferring their households to land (Paper III). This study shows that entitlement to land also ensures sanitation and education services for nomad fishing households. *Khas*⁷ land

⁷ It has been shown that in households with a title to state-owned *khas* land, incomes have increased and diversified. An associated positive relationship between ownership of *khas* land and increased expenses for food consumption, education and health has been identified. At the same time, more sustainable farming practices and more responsible usage of land and water resources are encouraged (Barakat 2005, as cited in Kabir & Ali 2011). The access to *khas* land also acts as a catalyst to help organise poor people to claim their entitlements and raise their voice to be heard (Kabir & Ali 2011).

reform could reduce pressure on fisheries, because some of those fishing communities will find livelihoods in agricultural activities (Paper IV), to contribute to the food security of fishing households (Paper II).

Poverty and vulnerability in small-scale fisheries are also related to an insecure access to resources, corruption, and poorly enforced laws in support of fishers' livelihoods. This situation leads to fisheries resource degradation and income dissipation. Fishers are more worried about attacks from criminal gangs during fishing, rather than the state of the fishing stocks or risk of tiger attack (Paper II). Strengthening fishing rights and protective security will improve livelihood security and can move them out of poverty (Allison et al. 2011b; Cunningham et al. 2009). As in our context, fishers' livelihoods are enmeshed in a series of 'unfreedoms' (sensu Sen), both in their fishing grounds and in their living spaces, providing protective security will give them the freedom necessary to avoid poverty (Paper V). 'Freedom', as mentioned by Sen (1999) "(...) is not a freedom to overexploit and destroy but a freedom to pursue a better life, built on secure entitlements, proficient capabilities, and social justice that enables people to be resourceful, autonomous, and creative in forming their own institutions" (Jentoft et al. 2011: 453). To realize this freedom, small-scale fishers need access to health, education, credit and market access. Participation in political process and freedom to organize are also required to make them capable of managing their own issues including their resources and communities affairs (Jentoft et al 2011). So, fisheries development "should therefore begin with Sen's realization that poverty essentially involves relationships to things, to people and to institutions that limit their action space, deny them of basic entitlements, and block them from developing and employing their individual and collective capabilities" (Paper V: 359). In a similar way, González (2011: 278 [emphasis in original]) also argues that "empowerment is for fisher communities *an enabling process* through which poverty can be tackled".

The FAO (2007) emphasizes that both responsible fisheries and goals related to poverty reduction can be achieved by strengthening basic human rights of fishers. The human rights approach advocates the importance of removing different obstacles, such as illiteracy that prevent people from exercising legitimate activities. So, it is required to strengthen the ability of fishing communities, make them aware of claims and responsibilities and exercising them effectively (FAO 2010). Our study puts further an emphasis on the social inclusion of marginalized fishing communities into mainstream economic opportunities (FAO 2010; Paper II). Such inclusion, interaction, and helpful connections will certainly open up opportunities and provide the necessary 'room for manoeuvre'.

However, the process of transferring *khas* land to extremely poor and landless populations is difficult in the context of Bangladesh and bears conflicts potential with powerful elites, who in most cases capture the ownership to *khas* land (Kabir & Ali 2011; Paper II).

7 Concluding remarks

Improving the well-being of small-scale fishers, while maintaining the sustainability of the natural environment, is a major challenge in many parts of the world (Jentoft et al. 2011) and both objectives need to go together (FAO 2010). Preserving fish stocks may be a necessary, but not a sufficient, condition for poverty reduction. As we discussed above, poverty in small-scale fisheries

“(…) is now better understood and recognized as a complex issue with socio-institutional factors generally being more important than pure economic or biological aspects” (FAO 2010: 70).

This thesis illuminates the importance of considering vulnerability to risk and shocks that impinge on the livelihoods of small-scale fishers prior to devise any poverty alleviation strategy. The policies needed to reduce poverty in small-scale fisheries must also address the vulnerability context in which fishing communities are living and operating their fishing activities.

It is obvious that poor income is a major concern for small-scale fishing people in Bangladesh. But those who have at least productive assets for fishing are not the ‘poorest of the poor’ in terms of income criterion. Nevertheless, the majority of them suffer from human development poverty in terms of other criteria such as widespread illiteracy and poor nutritional standards, among some others. They are indeed vulnerable irrespective of assets and endowments. Externally, they are exposed to different shocks and stresses. For instance, fishers face the high-risk during fishing activities both in the sea and in the mangrove forest, abuse by criminal gangs, and insecure access to fish stocks both for natural and anthropogenic causes. Internally, poor fishers are defenceless because they are largely illiterate; they are marginalized and socially excluded due to their ‘lower status’ of occupation, or social prejudices against ‘tiger widows’. These may influence the probability of marginalization and degree of deprivation, limiting fisher’s capacity to manifest their agency.

Better off households who are sometimes similarly vulnerable, may not be poor today, but sudden shock can push them into poverty. Thus, even better income from fishing does not translate into livelihood sustainability; fishers are rather entrapped into a circle of deprivation and enmeshed with ‘unfreedom’ that warrants interventions. It is imperative that, poverty alleviation strategies should aim at not only lifting poor out of poverty, but need also to protect vulnerable ones from getting into poverty. Accordingly, for sustainable livelihoods of small-scale fishers in Bangladesh, the study suggests two-pronged strategies. First, it is essential to protect fishers from vulnerability and shock exposure by creating buffers. In a similar vein, it is also urgent to expand fishers’ livelihoods opportunities. There is a clear need of education, awareness-raising, and healthcare for fishing people to be successfully productive. Poor fishers need economic facilities for the procurement of productive assets and reduction of shock exposure. They need access to social opportunities to overcome exclusion and marginalization.

'Protective security' from abuse and exploitation is another fundamental requirement- this study asks for. Poverty alleviation strategies and policies for fisheries communities should not only target the fishermen, but also aim at uplifting the women and the contributions they make, by focusing on female education and awareness-raising.

References

- Adger, W. N. (2006). Vulnerability. *Global Environmental Change*, 16(3), 268-281.
- Ahmed, N., Troell, M., Allison, E. H., & Muir, J. F. (2010). Prawn postlarvae fishing in coastal Bangladesh: Challenges for sustainable livelihoods. *Marine Policy*, 34(2), 218-227.
- Alam, M. F., & Thomson, K. J. (2001). Current constraints and future possibilities for Bangladesh fisheries. *Food Policy*, 26(3), 297-313.
- Ali, M. Y. (1997). *Fish, water and people*. Dhaka: University Press Ltd.
- Ali, S. M. Z. (2010). Supply chain and prices of Hilsa fish in Bangladesh. Dhaka: Bangladesh Institute of Development Studies (BIDS). Retrieved from <http://bdnews24.com/details.php?id=155054&cid=2>, [Access date 23rd March, 2011].
- Allison, E. H., & Ellis, F. (2001). The livelihoods approach and management of small-scale fisheries. *Marine Policy*, 25(5), 377-388.
- Allison, E. H., & Horemans, B. (2006). Putting the principles of the Sustainable Livelihoods Approach into fisheries policy and practice. *Marine Policy*, 30(6), 757-766.
- Allison, E. H., Béné, C., & Andrew, N. L. (2011a). Poverty reduction as a means to enhance resilience in small-scale fisheries. In R. S. Pomeroy & N. Andrew (Eds.), *Small-scale fisheries management: Frameworks and approaches for the developing world* (pp. 216-237). Cambridge, MA: CAB International.
- Allison, E. H., Ratner, B. D., Åsgård, B., Willmann, R., Pomeroy, R., & Kurien, J. (2011b). Rights based fisheries governance: From fishing rights to human rights. *Fish and Fisheries*, 13(1), 14-19.
- Amarasinghe, O., & Bavinck, M. (2011). Building resilience: Fisheries cooperatives in Southern Sri Lanka. In S. Jentoft & A. Eide (Eds.), *Poverty Mosaics: Realities and prospects in small-scale fisheries* (pp. 383-406). Dordrecht: Springer Science+Business Media B.V.
- Andrade, H., & Midré, G. (2011). The merits of consensus: Small-scale fisheries as a livelihood buffer in Livingston, Guatemala. In S. Jentoft & A. Eide (Eds.), *Poverty mosaics: Realities and prospects in small-scale fisheries* (pp. 427-448). Dordrecht: Springer Science+Business Media B.V.
- Andrew, N. L., Béné, C., Hall, S. J., Allison, E. H., Heck, S., & Ratner, B. D. (2007). Diagnosis and management of small-scale fisheries in developing countries. *Fish and Fisheries*, 8(3), 227-240.
- Azad, A. K., Lin, C. K. & Jensen, K. R. (2007). Wild shrimp larvae harvesting in the coastal zone of Bangladesh: Socio-economic perspectives. *Asian Fisheries Science*, 20, 339-357.
- Barakat, A. (2005). Poor people's rights in *khas* land in Bangladesh: Problems and solution (in Bengali). Land Rights and Poverty Alleviation. Dhaka: BLAST.
- Baulch, B., & McCulloch, N. (1998). Being poor and becoming poor: Poverty status and transitions in rural Pakistan. IDS Working Paper 79. Brighton: Institute of Development Studies.
- Bavinck, M. (2011). Wealth, poverty, and immigration: The Role of institutions in the fisheries of Tamil Nadu, India. In S. Jentoft & A. Eide (Eds.), *Poverty mosaics: Realities and prospects in small-scale fisheries* (pp. 172-191). Dordrecht: Springer Science+Business Media B.V.

- Béné, C. (2003). When fishery rhymes with poverty: A first step beyond the old paradigm on poverty in small-scale fisheries. *World Development*, 31(6), 949-975.
- Béné, C. (2004). Poverty in small-scale fisheries: A review and some further thoughts. In E. Neiland & C. Béné (Eds.), *Poverty and small-scale fisheries in West Africa* (pp. 61-82). Dordrecht: Food and Agricultural Organization of the United Nations and Kluwer Academic Publishers.
- Béné, C. (2006). Small-scale fisheries: Assessing their contribution to rural livelihoods in developing countries. FAO Fisheries Circular No. 1008. Rome: Food and Agricultural Organization of the United Nations.
- Béné, C. (2009). Are fishers poor or vulnerable? Assessing economic vulnerability in small-scale fishing communities. *Journal of Development Studies*, 45(6), 911-933.
- Béné, C., & Friend, R. M. (2011). Poverty in small-scale inland fisheries: Old issues, new analysis. *Progress in Development Studies*, 11(2), 119-144.
- BNP. (2009). Small-scale capture fisheries-A global overview with emphasis on developing countries. A preliminary report of the Big Numbers Project. Rome: Food and Agricultural Organization of the United Nations and WorldFish Center.
- Borooh, V. K. (2005). Caste, inequality and poverty in India. *Review of Development Economics*, 9, 399-414.
- Campbell, J., Whittingham, E., & Townsley, P. (2006). Responding to coastal poverty: Should we be doing things differently or doing different things? In C. T. Hoanh, T. P. Tuong, J. W. Gowing & B. Hardy (Eds.), *Environment and livelihoods in tropical coastal zones: Managing Agriculture-Fishery-Aquaculture conflicts* (pp. 274-292). Oxfordshire: CAB International.
- Carney, D. (1999). *Approaches to sustainable livelihoods for the rural poor*. Poverty Briefing No. 2. London: Overseas Development Institute.
- Chambers, R. (2006) Editorial Introduction: Vulnerability, Coping, and Policy. *IDS Bulletin* 37(4): 33-40.
- Charles, A. T. (2001). *Sustainable fishery systems*. Fish and Aquatic Resources Series, Vol. 5. UK: Blackwell Science.
- Chuenpagdee, R. (2011). Too big to ignore: Global research network for the future of small-scale fisheries. In R. Chuenpagdee (Ed.), *World small-scale fisheries: Contemporary visions* (pp. 383-394). Delft: Eburon Academic Publishers.
- Clay, E. J., & Schaffer, B. B. (1984). Conclusion: Self awareness in policy practice. In E. J. Clay & B. B. Schaffer (Eds.), *Room for manoeuvre: an exploration of public policy in agriculture and rural development* (pp. 191-193). London: Heinemann.
- Cleaver, F. (2005). The inequality of social capital and the reproduction of chronic poverty. *World Development*, 33(6), 893-906.
- Cunningham, S. (1993). Fishermen's incomes and fisheries management. Research Paper No. 61. Portsmouth: CEMARE, University of Portsmouth.
- Cunningham, S., Neiland, A. E., Arbuckle, M. & Bostock, T. (2009). Wealth-based fisheries management: Using fisheries wealth to orchestrate sound fisheries policy in practice. *Marine Resource Economics*, 24, 271-287.
- Department of Fisheries (2005). *Hilsa Conservation and Management*. Training Manual. Dhaka: Department of Fisheries.
- Dercon, S. (2006). Vulnerability: A micro perspective. In F. Bourguignon, B. Pleskovic & J. van der Gaag (Eds.) Annual World Bank Conference on Development Economics-Europe: *Securing development in a unstable world* (pp.117-145). Washington DC: The World Bank.

- Dercon, S. (2001). Assessing vulnerability. Jesus College and CSAE, Department of Economics: Oxford University.
- Devereux, S., Baulch, B., Macauslan, I., Phiri, A., & Sabates-Wheeler, R. (2006). Vulnerability and social protection in Malawi. IDS Discussion Paper 387. Brighton: Institute of Development Studies.
- DFID. (1997). Eliminating World Poverty: A Challenge for the 21st Century. White Paper on International Development. London. Retrieved from <http://www.dfid.gov.uk/Pubs/files/whitepaper1997.pdf>, [Access date: 2nd November, 2011].
- Dunn, I. G. (1989). Development of inland fisheries under constraints from other uses of land and water resources: Guidelines for planners. FAO Fisheries Circular No. 826. Rome: Food and Agricultural Organization of the United Nations.
- Eide, A., Bavinck, M., & Raakjær, J. (2011). Avoiding poverty: Distributing wealth in fisheries. In S. Jentoft & A. Eide (Eds.), *Poverty mosaics: Realities and prospects in small-scale fisheries* (pp. 13-25). Dordrecht: Springer Science+Business Media B.V.
- Eade, D. & Williams, S. (Eds) (1995). The Oxfam handbook of development and relief (Vol. 2). Oxford: Oxfam Publishing.
- FAO (2000). Poverty in coastal fishing communities. In Advisory Committee on fishery research third session December 5–8, 2000. Rome: Food and Agriculture Organization of the United Nations. Retrieved from: <http://www.fao.org/DOCREP/MEETING/003X8905E.html>, [Access date: 17th April, 2012].
- FAO. (2005). Increasing the contribution of small-scale fisheries to poverty alleviation and food security. FAO Technical Guidelines for Responsible Fisheries No. 10. Rome: Food and Agricultural Organization of the United Nations.
- FAO. (2007). Social issues in small-scale fisheries (COFI/2007/6). Committee on Fisheries Twenty-Seventh Session, Rome, 5-9 March 2007. Retrieved from <ftp://ftp.fao.org/>, [Access date: 17th April, 2012].
- FAO. (2010). The State of world fisheries and aquaculture. Fisheries and Aquaculture Department. Rome: Food and Agricultural Organization of the United Nations.
- Firth, R. (1946). *Malay fishermen: their peasant economy*. London: Kegan Paul, Trench, Trubner & Co. Ltd.
- Friedmann, J. (1996). Rethinking poverty: Empowerment and citizen rights. *International Social Science Journal*, 48(2), 161-172.
- Gain, P. (1995). Attack of the shrimps. *New Internationalist Magazine*. Issue 267.
- Gaskell, G. (2000). Individual and Group Interviewing. In M. W. Bauer & G. Gaskell (Eds.), *Qualitative researching with text, image and sound: A practical handbook* (pp. 38-56). London: Sage Publications.
- Giesbert, L., & Schindler, K. (2012). Assets, shocks, and poverty traps in rural Mozambique. *World Development*, 40(8), 1594-1609.
- Gittleston, J., & Mookherji, S. (1997). The application of anthropological methods to study the intrahousehold resource allocation. In: L. Haddad, J. Hoddinott & H. Alderman (Eds.), *Intrahousehold resource allocation in development countries: Models, methods, and policy* (pp. 193-212). Baltimore and London: The John Hopkins University Press.
- Glaser, B., & Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. New York: Aldine Publishing Company.

- Glavovic, B. (2008). Poverty and inequity at sea: Challenges for ecological economics. In M. G Patterson & B. C. Glavovic (Eds.), *Ecological economics of the oceans and coasts* (pp. 244-265). Cheltenham: Edward Elgar Publishing Limited.
- González, M. (2011). To make a fishing life: Community empowerment in small-scale fisheries in the Pearl Lagoon, Nicaragua. In S. Jentoft & A. Eide (Eds.), *Poverty mosaics: Realities and prospects in small-scale fisheries* (pp. 275-308). Dordrecht: Springer Science+Business Media B.V.
- Hammersley, M., & Atkinson, P. (1995). *Ethnography: Principles in practice* (2nd ed.). London: Routledge.
- Hay, I. (2003). Ethical practice in geographical research. In N. Clifford & G. Valentine (Eds.), *Key methods in geography* (pp. 37-54). London: Sage Publications.
- Heck, S., Béné, C., & Reyes-Gaskin, R. (2007). Investing in African fisheries: Building links to the Millennium Development Goals. *Fish and Fisheries*, 8(3), 211-26.
- Hoogeveen, J., Tesliuc, E., Vakis, R., & Dercon, S. (2004). A Guide to the analysis of risk, vulnerability and vulnerable groups. Social Protection Unit, Human Development Network. The World Bank. Retrieved from http://wbwebapps5/wwextweb/sp/risk_management/PDF_files/RVA-V6.pdf, [Access date: 12th May, 2012].
- Hoq, M. E. (2007). An analysis of fisheries exploitation and management practices in Sundarbans mangrove ecosystem, Bangladesh. *Ocean and Coastal Management*, 50, 411-427.
- Hoq, M.E., Islam, M. N., Kamal, M. & Wahab, M. A. (2003). Fisheries structure and management implications in Sundarbans mangrove reserve forest, Bangladesh. *Indian Journal of Fisheries*, 50(2), 243-249.
- Hossain, M. M., Islam, M. A., Ridgway, S., & Matsuishi, T. (2006). Management of inland open water fisheries resources of Bangladesh: Issues and options. *Fisheries Research*, 77, 275-284.
- Hulme, D., & Shepherd, A. (2003). Conceptualizing chronic poverty. *World Development*, 31(3), 403-423.
- Hye, H.A. (2006). *Below the line: Rural Poverty in Bangladesh*. Dhaka: University Press Limited.
- ILO. (1976). *Employment, growth and basic needs: A one world problem*. Tripartite world conference on employment, income distribution and social progress and the international division of labour. Geneva: International Labour Office.
- Islam, G. M. N., Yew, T. S., Abdullah, N. M. R., Viswanathan, K. K. (2011). Social capital, community based management, and fishers' livelihood in Bangladesh. *Ocean and Coastal Management*, 54(2), 173-180.
- Islam, M. S. & Wahab, M. A. (2005). A review on the present status and management of mangrove wetland habitat resources in Bangladesh with emphasis on mangrove fisheries and aquaculture. *Hydrobiologia*, 542(1), 165-190.
- Islam, S. A. (2004). Overcoming poverty in Bangladesh: Search for a new paradigm. *Bangladesh e-Journal of Sociology*, 1(2), 29-49.
- Ito, S. (2002). From rice to prawns: Economic transformation and agrarian structure in rural Bangladesh. *Journal of Peasant Studies*, 29(2), 47-70.
- Jentoft, S., & Eide, A. (2011). Setting the stage. In S. Jentoft & A. Eide (Eds.), *Poverty mosaics: Realities and prospects in small-scale fisheries* (pp. 1-10). Dordrecht: Springer Science+Business Media B.V.
- Jentoft, S., Eide, A., Bavinck, M. Chuenpagdee, R., & Raakjær, J. (2011). A better future: Prospects for small-Scale fishing people. In S. Jentoft & A. Eide (Eds.), *Poverty*

- mosaics: Realities and prospects in small-scale fisheries* (pp. 451-469). Dordrecht: Springer Science+Business Media B.V.
- Jentoft, S., Midré, G. (2011). The Meaning of poverty: Conceptual issues in small-scale fisheries research. In S. Jentoft & A. Eide (Eds.), *Poverty mosaics: Realities and prospects in small-scale fisheries* (pp. 43-68). Dordrecht: Springer Science+Business Media B.V.
- Kabir, S. & Ali. K. (2011). Making productive use of khas land: Experiences of extreme poor households. Working Paper Number 6. Dhaka: The Extreme Poverty Research Group (EPRG).
- Khan, S.M. and M.S. Haque. (2003). A socioeconomic and bioeconomic analysis of coastal fisheries of Bangladesh. In G. Silvestre, L. Garces, I. Stobutzki, M. Ahmed, R.A. Valmonte-Santos, C. Luna, L. Lachica-Aliño, P. Munro, V. Christensen and D. Pauly (Eds.), *Assessment, Management and Future Directions of Coastal Fisheries in Asian Countries* (pp. 387-438). WorldFish Center Conference Proceedings 67. Penang, Malaysia: WorldFish Center.
- Kolding, J., & van Zwieten, P. A. M. (2011). The tragedy of our legacy: How do global management discourses affect small-scale fisheries in the south? *Forum for Development Studies*, 38(3), 267-97.
- Krishna, A. (2007). For reducing poverty faster: Target reasons before people. *World Development*, 35(11), 1947-1960.
- Krishna, A. (2010). *One illness away: Why people become poor and how they escape poverty*. New York: Oxford University Press.
- Legard, R., Keegan, J., & Ward, K. (2003). In-depth interviews. In Ritchie, J & Lewis, J. (Eds.), *Qualitative research practice: A guide for social science students and researchers* (pp.138-169). London: Sage Publications.
- Lewis, D., & Hossain, A. (2008). Tale of three villages: Power, difference and locality in rural Bangladesh. *Journal of South Asian Development*, 3(1), 33-51.
- Lofland, J. (1971). *Analyzing social settings: A guide to qualitative observation and analysis*. Belmont, CA: Wadsworth.
- Macfadyen G., & Corcoran, E. (2002). Literature review of studies on poverty in fishing communities and of lessons learned in using the Sustainable Livelihoods Approach in poverty alleviation strategies and projects. FAO Fisheries Circular No. 979. Rome. Food and Agriculture Organization of the United Nations.
- Matin, I., & Hulme, D. (2003). Programs for the poorest: Learning from the IGVGD program in Bangladesh. *World Development*, 31(3), 649-667.
- Maxwell, S. (1999). The meaning and measurement of poverty. ODI Poverty Briefing. Retrieved from www.odi.org.uk/resources/docs/3095.pdf, [Access date: 5th June 2012].
- McCulloch, N., & Calandrino, M. (2002). Poverty dynamics in rural Sichuan between 1991 and 1995. Brighton: Institute of Development Studies.
- McCulloch, N., & Calandrino, M. (2003). Vulnerability and chronic poverty in rural Sichuan. *World Development*, 31(3), 611-628.
- Mendoza, R. U. (2009). Aggregate shocks, poor households and children: Transmission channels and policy responses. *Global Social Policy*, 9, 55-78.
- Mills, D., Béné, C., Ovie, S., Tafida, A., Sinaba, F., Kodio, A., Russell, A., Andrew, N., Morand, P., & Lemoalle, J. (2009). Vulnerability in African small-scale fishing communities. *Journal of International Development*, 23, 308-313.
- Misturelli, F., & Heffernan, C. (2010). The concept of poverty: A synchronic perspective. *Progress in Development Studies*, 10(1), 35-58.

- Mkenda, A. F. (2000). The relative welfare of artisan fishermen in Zanzibar. Retrieved from <http://www.ibrarian.net/navon/page.jsp?paperid=462028&searchTerm=er>, [Access date: 7th June, 2012].
- Moser, C. (1998). The asset vulnerability framework: Reassessing urban poverty reduction strategies. *World Development*, 26(1), 1-19.
- Nabi, M. R. U., Hoque, M. A., Rahman, R. A., Mustafa, S., & Kader, M. A. (2007). Vulnerability context of the estuarine set bag net fishermen community in Bangladesh. *International Journal of Rural Management*, 3(2), 213-227.
- Narayan, D. (1997). *Voices of the poor: Poverty and social capital in Tanzania. Environmentally and Socially Sustainable Development Studies and Monograph Series 20*. Washington DC: The World Bank.
- Narayan, D., Chambers, R., Shah, M. K., & Petesh, P. (2000). *Voices of the poor: Crying out for change*. New York/Washington DC: Oxford University Press.
- Neiland, A.E. & Bén  , C. (Eds.). (2004). *Poverty and small-scale fisheries in West Africa*. Dordrecht: Food and Agricultural Organization of the United Nations. and Kluwer Academic Publishers.
- Nguyen, K. A. T. & Flaaten, O. (2011). Facilitating change: A Mekong Vietnamese small-scale fishing community. In S. Jentoft & A. Eide (Eds.), *Poverty mosaics: realities and prospects in small-scale fisheries* (pp. 335-357). Dordrecht: Springer Science+Business Media B.V.
- Njock, J.-C., & Westlund, L. (2010). Migration, resource management and global change: Experiences from fishing communities in West and Central Africa. *Marine Policy*, 34(4), 752-760.
- Onyango, P. O. (2011). *Poverty alleviation in small-scale fisheries: Governance challenges in Lake Victoria fishing communities, Tanzania*. PhD Thesis. Retrieved from <http://munin.uit.no/handle/10037/3551>, [Access date: 7th June, 2012].
- Panayotou, T. (1980). Economic conditions and prospects of small-scale fishermen in Thailand. *Marine Policy*, 4(2), 142-146.
- Patton, M. Q. (2002). *Qualitative evaluation and research methods* (3rd edition). Beverly Hills, CA: Sage Publications.
- Polit D., & Hungler, B. (1999). *Nursing research: Principles and methods*. Philadelphia, PA: Lippincott Williams & Wilkins.
- Pomeroy, R. S. (2012). Managing overcapacity in small-scale fisheries in Southeast Asia. *Marine Policy*, 36(2), 520-527.
- Pomeroy, R. S., & Andrew, N. L. (Eds.). (2011). *Small-scale fisheries management: Frameworks and approaches for the developing world*. Cambridge, MA: CAB International.
- Pomeroy, R., Nguyen, K. A. T. & Thong, H. X. (2009). Small-scale marine fisheries policy in Vietnam. *Marine Policy*, 33, 419-428.
- Rahman, M. M., Haque, M. M., Akhteruzzamam, M., & Khan, S. (2002). Socioeconomic features of a traditional fishing community beside the old Brahmaputra river, Mymensingh, Bangladesh. *Asian Fisheries Science*, 15, 371-386.
- Rahman, P. M. M., Matsui, N., & Ikemoto, Y. (2009). *The chronically poor in rural Bangladesh: Livelihoods constraints and capabilities*. Oxon: Routledge.
- Rashid, S. (2005). Common property rights and indigenous fishing knowledge in the inland openwater fisheries of Bangladesh. The case of Koibortta fishing community of Kishoregonj. PhD Thesis, Curtin University of Technology.

- Reardon T., & Vosti, S. A. (1995). Links between rural poverty and the environment in developing countries: Asset categories and investment in poverty. *World Development*, 23(9), 1495-1506.
- Ruddle, K. (1994). Changing the focus of coastal fisheries management. In R.S. Pomeroy (Ed.), *Community management and common property of coastal fisheries in Asia and the Pacific: Concepts, methods and experiences* (pp. 63-86). ICLARM Conf. Proc. 45. Metro Manila, Philippines: International Center for Living Aquatic Resources Management
- Salagrama, V. (2006). Trends in poverty and livelihoods in coastal fishing communities of Orissa state, India. FAO Fisheries Technical Paper No. 490. Rome: Food and Agricultural Organization of the United Nations.
- Salas, S., Bjørkan, M., Bobdilla, F., & Cabrera, M. A. (2011). Coping strategies of fishing communities in Yucatan, Mexico. In S. Jentoft & A. Eide (Eds.), *Poverty mosaics: Realities and prospects in small-scale fisheries* (pp. 195-220). Dordrecht: Springer Science+Business Media B.V.
- Salmi, P., Salmi, J., & Moilanen, P. (1998). Strategies and flexibility in Finnish commercial fisheries. *Boreal Environment Research*, 3, 347-359.
- Sen, A. (1977). Starvation and exchange entitlements: A general approach and its application to the great Bengal famine. *Cambridge Journal of Economics*, 1, 33-59.
- Sen, A. (1981). *Poverty and famines: An essay on entitlement and deprivation*. Delhi: Oxford University Press.
- Sen, A. (1999). *Development as freedom*. Oxford: Oxford University Press.
- Sen, B. (2003). Drivers of escape and descent: Changing household fortunes in rural Bangladesh. *World Development*, 31(3), 513-534.
- Smith, L. E. D., Nguyen, K. S., & Lorenzen, K. (2005). Livelihood functions of inland fisheries: Policy implications in developing countries. *Water Policy*, 7, 359-83.
- Spencer, L., Ritchie, J. & O'Connor, W. (2003). Analysis: Practices, principles and processes. In J. Ritchie, & J. Lewis (Eds.), *Qualitative research practice: A guide for social science students and researchers* (pp. 199-218). London: Sage Publications.
- Stenbacka, C. (2001). Qualitative research requires quality concepts of its own. *Management Decision*, 39(7), 551-555.
- Sumner, A. (2003). Economic and non-economic wellbeing: A review of the progress on the meaning and measurement of poverty. Paper presented at the WIDER conference 'Inequality, Poverty and Human Well-Being', Helsinki, 30-31 May.
- Takasaki, Y., Barham, B. L., Coomes, O. T. (2004). Risk coping strategies in tropical forests: Floods, illnesses, and resource extraction. *Environment and Development Economics*, 9(2), 203-224.
- Thorpe, A., Andrew, N. L., & Allison, E. H. (2007). Fisheries and poverty reduction. *CAB Reviews: Perspective in agriculture, veterinary science, nutrition and natural resources*, (85), 1-12.
- Toufique, K. A. (1997). Some observations on power and property rights in the inland fisheries of Bangladesh. *World Development*, 25(3), 457-467.
- UNDP. (2007) Fighting climate change: Human solidarity in a divided world, Human development report. Retrieved from http://hdr.undp.org/en/media/HDR_20072008_EN_Complete.pdf, [Access date: 7th June 2012].
- USAID (2006). A pro poor analysis of the shrimp sector in Bangladesh. Greater Access to Trade Expansion(GATE) Project. Office of women in development: U.S. Agency for International Development.

- Walmsley, S., Purvis, J., Ninnes, C. (2006). The role of small-scale fisheries management in the poverty reduction strategies in the Western Indian Ocean region. *Ocean & Coastal Management*, 49(11), 812-833.
- Willmann, R. (2004). Poverty in coastal fishing communities. In E. Neiland & C. Béné (Eds.), *Poverty and small-scale fisheries in West Africa*. (pp. 245-252). Dordrecht: Food and Agriculture Organization of the United Nations and Kluwer Academic Publishers.
- World Bank. (1978). World development report. Prospects for growth and alleviation of poverty. Washington D.C.: The World Bank.
- World Bank. (2000). World development report 2000/2001. Attacking poverty. Oxford: Oxford University Press for the World Bank.
- Yin., R. K. (2009). *Case study research: Design and methods* (4th edition). Los Angeles, CA: Sage Publications.
- Zimmerman, F. J., & Carter, M. R. (2003). Asset smoothing, consumption smoothing and the reproduction of inequality under risk and subsistence constraints. *Journal of Development Economics*, 71, 233-260.

(D) Papers I-V

Paper I

Islam, M. M. (2011). Living on the margin: The poverty-vulnerability nexus in the small-scale fisheries of Bangladesh¹. In S. Jentoft & A. Eide (Eds.), *Poverty mosaics: Realities and prospects in small-scale fisheries* (pp. 71-95). Dordrecht: Springer Science+Business Media.

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Chapter 5

Living on the Margin: The Poverty-Vulnerability Nexus in the Small-Scale Fisheries of Bangladesh

Mohammad Mahmudul Islam

Abstract This chapter examines the relationship between poverty and vulnerability in small-scale fisheries of Bangladesh. For this purpose, data were collected in three coastal fishing communities. The results show that in small-scale fisheries, poverty is a complex issue, with a wide array of causal factors in effect. Small-scale fishers' livelihoods are threatened by: low productivity of fisheries and high dependency on certain species; seasonality in fishing; frequent natural disasters; heavy debt bondage; coastal piracy and other illegal rent seeking activities; mass illiteracy; and lack of participation in political processes and local institutions, to mention some of the problems. Thus in Bangladesh, small-scale fishers are forced to live on the margin of existence where they are extremely vulnerable to shocks such as environmental disasters. The study finds that a combination of different livelihood strategies is an important tool for escaping poverty in the fishing communities. I argue that to arrest poverty in small-scale fishing communities such as those of Bangladesh, addressing vulnerability is vital; and creating a buffer against crisis is urgent.

5.1 Introduction

Fish and fisheries have always been an inseparable part of the life and livelihoods of the people of Bangladesh. A widely known maxim *Maache-Bhate Bangali* meaning "Fish and rice make a Bengali" illustrates the importance of fish in the main diet of most Bangladeshis (cf. Alam and Thomson 2001). Fish alone supplies about 60% of animal protein intake by the population of Bangladesh. Fisheries also play a

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major role in employment, foreign exchange earnings, and other aspects of the economy. The sector contributes about 4% of the national gross domestic product (GDP) and 7% to both the agricultural GDP and the country's total export earnings (Rahman et al. 2003). Moreover, fisheries provide full-time employment for roughly 1.5 million professional fishers, and another ten million people are part-time fishers; thus about one-eighth of the total population of the country is professionally related to fisheries. More than 90% of the total marine fish production in Bangladesh comes from small-scale coastal fisheries (BBS 2007; Bangladesh Economic Review 2008).

Though small-scale fisheries play a critical role in the livelihoods for a large percentage of the population in the country, this sector has failed to draw adequate attention to its poverty reduction potential – from academic research as well as from the policy arena. A substantial amount of academic literature reports on the significant poverty reduction that Bangladesh has achieved since the 1990s, but with a conspicuous absence of references to small-scale fisheries. Given that the small-scale fisheries sector is playing an important role in providing food security, income, and labor, it seems a paradox that so many of its participants are living in extreme poverty. The situation for the poor fishers is complex. Coastal small-scale fishers have the advantage of access to coastal resources (e.g., fish, forests) that are often not available for the poor living in inland districts. Moreover, the economic value of fish and other aquatic resources from wetlands has been found to be more than double the return from a single rice crop (Colavito 2002). Nevertheless, small-scale fishers of Bangladesh, as in many other parts of the world, are among those who are living in persisting poverty.

Fishers' poverty and vulnerability are intimately linked, as stated by Béné (2006): “. . . fishing activity may be seen as a source of vulnerability, where vulnerability becomes a source of poverty: People are more prone to poverty because they are more vulnerable; and they are more vulnerable because of the type of activities they pursue, namely fisheries” (p. 11). As will be demonstrated in what follows, the livelihoods of poor coastal small-scale fishers in Bangladesh are also enmeshed into a series of vulnerabilities. This chapter, therefore, aims at a deeper understanding of poverty and vulnerability, as they are common among coastal fishers in Bangladesh. To keep the analysis simple, but maintaining the essence of the problem, two main questions will be addressed. These are: (1) How do poverty and vulnerability manifest in fishing livelihoods? (2) How do fishers, individually and collectively, cope with poverty and resource crises and what are the conditions to break the vicious circle of their poverty?

The chapter is arranged as follows. The next section builds on theories on poverty and vulnerability which is used to analyze the empirical data. Section 5.3 describes the methods that were used to collect data, along with a brief description of the study areas. The empirical findings on small-scale fishing livelihoods of Bangladesh are presented in Sect. 5.4; whereas Sect. 5.5 shows how fishers cope with vulnerability and poverty, and Sect. 5.6 provides the conditions to break the vicious circle of poverty in fishing communities. The final Sect. 5.7 summarizes the main findings of the study and offers some concluding remarks.

5.2 Theoretical Perspectives

5.2.1 Poverty

The discourse on poverty and development has so far been dominated by the outsider perspectives and expertise of non-poor – professionals, politicians, civil servants, elected officials, academics; whereas, the perspectives of the poor themselves have been largely neglected (Narayan et al. 2000; Beck and Nesmith 2001). Questioning this practice, Beck and Nesmith (2001) argue that for eradicating poverty, poor people’s knowledge and abilities must be understood within the socio-economic structure and context that reproduces poverty. This understanding must be incorporated into development planning. Narayan et al. (2000), in their *Voices of the poor: Crying out for change* formulated the key elements that contribute to poverty. As they state, according to the perspective of some of the 2.8 billion poverty experts, i.e., the poor themselves, poverty is multi-dimensional and complex; it is manifested in the lack of assets required for well-being. Notably, well-being is beyond material poverty; it has multiple, interlocking facets. Also, these dimensions mingle to create and sustain powerlessness, a lack of freedom of choice and action. Each dimension can further cause or compound the others. Caught in multiple deprivations, escapement is a greater struggle than many can handle. This trap is described by the poor by using metaphors like bondage, slavery, of being tied like “bundles of straw,” leaving them unable to act (Narayan et al. 2000).

There is an overwhelming notion that fishers are among the poorest of the poor (Béné 2003); that small-scale fisheries are indeed equated with poverty. However, the widely accepted perception that fisheries “rhymes with poverty” experienced a recent shift from an old paradigm to a multi-dimensional model of poverty, which involves the idea that poverty in small-scale fisheries is not only the consequence of scarce resources, but of a number of other factors as well. Disaggregating the poor fishers into (socially) marginalized, (economically) excluded, (politically) disempowered, and (class-)exploited groups, the model reveals a more holistic range of different mechanisms that lead to impoverishment (Béné 2003).

5.2.2 Vulnerability

Vulnerability is conceived of as a key dimension of fisher’s poverty (Béné 2009). When people are poor, they are also less resilient. They do not easily recover from shocks or crises. Any further shocks or crises such as a bad fish harvest, illness of the family head, financial asset loss etc. may easily push them into extreme poverty. Thorpe et al. (2007) find that fishing communities are vulnerable in heterogeneous ways, so that the poorest tend to be disadvantaged in receiving food and financial help to rebuild their livelihoods, as experienced in the case of the 2004 Asian Tsunami. However, though poor fishers are usually among the most vulnerable, vulnerability is not simply another word for poverty.

Chambers (2006) who distinguishes poverty from vulnerability describes the former as deprivation, lack or want; whereas, the latter is defined as “defencelessness, insecurity, and exposure to risk, shocks and stress” (p. 33). Again, vulnerability has two sides: “an external side of risks, shocks, and stress to which an individual or household is subjected; and an internal side which is defenceless, meaning a lack of means to cope without damaging loss” (p. 33). He argues that understanding vulnerability helps to disaggregate poverty. He further elaborates vulnerability as possessing inadequate capacities to cope with stress, crises, and shocks (which implicitly subsumes timely and effective external interventions), and the attendant’s slow or limited recovery from crises.

The most vulnerable individuals, groups, classes, and regions are thus most exposed to potentially harmful perturbations, i.e., those who have limited coping capacity and suffer the most from the impacts of economic crises or environmental degradation such as natural disasters and climate change (Bohle et al. 1994). Boshier et al. (2007) assess four key determinants of vulnerability in rural India: people’s access to assets, to facilities, to political networks, and to social networks. The most vulnerable people and communities typically have few capabilities, and therefore little choice about where and how they live (Sen 1981). They cannot therefore easily escape when disaster hits.

Yamin et al. (2005) argue that the concept of vulnerability in poverty studies is important because it draws attention to the multiple dimensions of deprivation, such as social exclusion and gender, as well as to poverty dynamics. It also helps to focus on the established patterns of coping and resilience used by those directly affected. Understanding vulnerability requires a deep understanding of the climatic, social, generational, geographic, economic, and political processes that generate poverty, particularly chronic poverty.

Boshier (2007) holds that in-built community level survival strategies (e.g., neighborly assistance, social capital) can provide a level of resilience that can reduce vulnerability. He argues that without support from civil society and social institutions, the conditions of the rural poor may never improve. Inequalities in vulnerability are also attributed to the institutions that, in some cases, have been accused of mismanagement and corruption (Kothari 1986; Kohli 1990; Narayanasamy et al. 2000; Robbins 2000 – as quoted in Boshier 2007).

Hence, it is necessary to understand the social and institutional dimensions of vulnerability that often come hand in hand with those that are related to natural disasters. Considering this, access to key socio-political institutions may enable people or whole communities to get hold of vulnerability-reducing resources, such as those that allow quick recovery. The types of social institutions and the strength of social networks may therefore influence an individual’s survival strategies, in terms of “drawing upon communal resources,” and “drawing on social relationships - patronage, kinship, friendship and informal credit networks” (Agarwal 1990). Such relationships may be important in providing vulnerability-reducing resources, particularly when government mechanisms are unavailable, or people have been deliberately or otherwise marginalized (Boshier et al. 2007).

5.3 Materials and Methods

This research on poverty in the small-scale fisheries in Bangladesh is mainly articulated with qualitative fieldwork data – collected through observations, individual and key informant interviews, and focus group discussions. Secondary data is drawn from documents and reports published by the government and different NGOs. The fieldwork was carried out in three fishing communities along the coast of Bangladesh from December 2007 to February 2008, and then updated in 2010 from January to April. For some variables, a household survey was conducted. In choosing the sampling area, diversity of fishing grounds, fishing gear, target species, and caste structure were considered. More specifically, the sampling areas cover: (1) One fishing community (Mothurapur) adjacent to the Sundarbans mangrove forest; (2) Two fishing communities (Selimpur in Chittagong District; and Thakurtala in Cox's Bazar district) from the South-eastern coast of Bangladesh (Fig. 5.1).

Focus group discussions lasting 45–60 min were conducted with seven to eight participants in each group. Ten key informants were interviewed. Several (8–10) key issues were covered by the in-depth interviews. The range of key informants spread through different backgrounds (e.g., fish harvester, crab collector, shrimp fry collector, fishers with boats, without boats, fish sellers, fishers' community leader, fisherwomen, NGO officials). The interviews were open-ended to allow some flexibility.



Fig. 5.1 Map of Bangladesh showing the three study areas. (1) The village of Mothurapur is situated in the Shymnagar *thana* (subdistrict) of Satkhira district which is located in the south-western corner of Bangladesh. (2) Selimpur is a caste-based Hindu fishing hamlet which is located approximately 20 km north of Chittagong, the main port city of Bangladesh. (3) The fishing village of Thakurtala is situated in Moheshkhali *thana* – a subdistrict of Cox's Bazar district

Secondary data was collected from Dhaka for public reports, and also from some local NGOs which are working in the coastal area with the small-scale fishers. Newspaper reports were also collected.

5.3.1 Study Areas

5.3.1.1 Mothurapur

The village of Mothurapur is situated in the Shymnagar *thana* (subdistrict) of Satkhira district which is located in the south-western corner of Bangladesh. Mothurapur is situated on a coastal embankment of a river bordering the Sundarbans Mangrove Forest. The community is comprised of both low caste Hindu and Muslim families who mostly rely on the extraction of common pool resources for their livelihoods. The access to resource extraction of the Sundarbans Mangrove Forest is *de jure* controlled by the Government. Fishers have to pay a certain amount of revenue to collect a pass for fishing in the forest for a certain period of time. In the village, the sanitation facility is poorly developed; only a few families have shared or own a sanitary toilet. Drinking water is in severe shortage; and people (mainly women and young girls) have to travel more than 1 km for collection of drinking water.

5.3.1.2 Selimpur

Selimpur is a caste-based Hindu fishing hamlet which is located approximately 20 km north of Chittagong, the main port city of Bangladesh. Most people of this community are involved in the fishery, and very few households are found to work in non-fishing related occupations, as young people have now to take up wage employment in the city. Proximity to the city and well connected communication pave the way for some NGO activities in the area. But still, sanitation facilities are poorly developed and most households have pit latrines. Drinking water access is secured for all by tube wells.

5.3.1.3 Thakurtala

The fishing village of Thakurtala is situated in Moheshkhali *thana* – a subdistrict of Cox's Bazar district. Moheshkhali is a coastal island connected to the mainland either by water way transportation to Cox's Bazar, or a bridge linked to Chakaria *thana* of Cox's Bazar district. Thakurtala is a traditional fishing village inhabited by low caste hereditary Hindu fishers who mainly fish in the Moheshkhali channel, the offshoot of the Bay of Bengal that separates the island from the mainland of Bangladesh. The village is situated in proximity to the *thana* headquarters of Moheshkhali. Land scarcity and increased population pressure make the community settlement very congested; and saline water intrusion is another problem. In general, the sanitation is poorly developed, though all have access to safe drinking water.

5.4 Small-Scale Fishing Livelihoods

5.4.1 Fisheries System and Fishing Assets

Along the Chittagong coast, where Selimpur is situated, traditional Hindu fishers catch mainly Bombay duck (*Harpodon nehereus*), Sergestid shrimp (*Acetes* species), and a few other species of estuarine fish using an Estuarine Set Bag Net (ESBN), using small engine-boats from mid-November to mid-April. The production in the sea during the remaining 3 months (i.e., mid-April to mid-July) is very low; partly due to non-availability of fish at that time as a result of high salinity in the coastal waters (during this period, fish move toward the deep sea), and partly for taking preparation (net mending or weaving, boat repairing, finance mobilization) for the ensuing peak season for Hilsha (*Tenuolosa ilisha*) (Kleith et al. 2003).

These fishers rely on the Hilsha fishery for their yearly income, which ranges from mid July to mid November. The Hilsha fishery constitutes the largest single fishery in Bangladesh, contributing about 1/6th of the country's total fish production. The Hilsha is a moderately sized fish; it may reach up to 60 cm in total length, and weight may reach up to 2.5 kg. This species obtains a high price in local and international markets. It is estimated that about two million fishers and traders directly and indirectly are engaged in this fishery (Kabir 2006).

Fishers from Thakurtala also use the ESBN for fishing in the Moheshkhali channel. Some fishers also fish offshore using a Marine Set Bag Net (MSBN). Those who use MSBNs cannot fish in the sea during the monsoon period of July to October, due to turbulent weather in the Bay of Bengal. Those fishers (our interviewed fishers) who fish in the Moheshkhali channel using ESBN, however, can fish all year. But nowadays productivity from the channel is seriously decreased, in part due to sedimentation in the channel. Many areas of the channel which were previously used for setting nets have now become unsuitable due to land accretion. Many species (mainly Hilsha species) have moved away from the channel. Consequently, the catches from ESBNs are drastically reduced, which take away direct income from the livelihoods of the fishers in the Thakurtala village.

In the Mothurapur study area of the Sundarbans mangrove forest, fishers use different gears to catch in the rivers, canals, and tributaries that criss-cross the forest. Most fishers do collective fishing in the forest by using beach seine on the river bank. Almost all women and young girls in the study area are involved with shrimp fry collection along the coastal embankment or in the vicinity of the forest. The boat, engine, and other fishing equipment are fishers' most productive assets. Social and economic differentiation is based on the ownership of these assets, as they dictate fishing strategies, access to fishing grounds, and influence economic benefits that the fishery brings to the fishing family. Access to productive assets (e.g., boats, nets) is, however, not secured for all coastal small-scale fishers.

5.4.2 *Vulnerability and Risk*

Risk and vulnerability are inseparable parts of fishing in the Bay of Bengal. The Bay of Bengal is one of the most disaster-prone regions in the world. Cyclones and tropical storms are yearly phenomena. In addition, the tidal activity is becoming increasingly turbulent, making fishing operations dangerous and limited. Rough seas, as well as frequent cyclones, often force coastal fishers to stay home or to abandon their fishing trip. Yet, due to very limited options for survival, many fishers defy warnings and continue fishing, which results in many fatalities every year. For instance, during cyclone Sidr in 2007, many fishers died due to ignoring the cautionary signal of a cyclone. During the last 50 years, about 0.7 million people were killed in Bangladesh due to cyclones and coastal storms.¹ Though there is no official record on how many fishers were killed or how many trawlers and nets were destroyed, the loss is certainly substantial.²

Fishing in the forest is also a risk, as tiger-human conflicts claim fishers' lives. During the study period, there were four cases of tiger-induced killings in the Shymnagar *thana*. In the study area, eight people who were the main earners in their families were killed by tigers over a period of about one decade. Income from risky fishing in the Sundarbans is further dissipated (mostly illegally) by rent-seeking activities of different levels from fishing to marketing.

“Income from fishing in the Sundarbans by fishers goes to seven (*symbolic* number for many) families.”

– said one fisher from Mothurapur

He further explained,

You have to give bribe to forest official to secure a pass for fishing. Extortion or ransom money goes to pirates; weightier and commission agent will exploit extra money in the fish landing centre, then *mohajon* or money lender will come to the scene to claim his money.

Fishers are exposed to piracy while at sea, which is particularly severe during the Hilsha fishing season, and in the case of the Sundarbans, all the year round. Fishers are kidnapped for ransom. They are always afraid of being assaulted, and are concerned that dacoits will snatch their boat or nets. Ironically, the pirated property is then sold back to the fishers through brokers or through their own contact with the dacoits.

Moreover, in case of coastal fishing, a peak week (*joo*) of good harvest can be followed by a lean week (*dala*) of poor harvest due to spring tide and neap tide periods. Usually, fishers do not fish during lean weeks of the month; thus, fishing is virtually limited to 2 weeks in a month. Such seasonality is common in our study areas in the Sundarbans and along the south-eastern coast of Bangladesh. Fishers live near their workplace on the beach or coastal embankment. Living near the work place of the coast offers scope for many livelihood activities from common pool resources, but also makes them vulnerable to cyclones. When disasters strike,

¹Daily Manabzamin (a Bengali Daily Newspaper) – 26 May 2009.

²The Mercantile Marine Department (MMD), the public authority for registration and licensing the industrial trawlers for fishing in the Bay of Bengal, does not keep track of fisher casualties. Small-scale fishing up to 30 m depth along the coast doesn't require a license.

limited finances make it difficult to restore homes and infrastructure. The loss of fishing gears, boats, livestock, and other household assets can wipe out entire livelihoods. Then families would have to rebuild their lives and livelihoods from scratch. Moreover, the accompanying loss of paddy fields and other food sources can worsen food insecurity along the coast, which often leads to health problems. The death of a household member capable of working can bring the whole family into extreme poverty and extended trauma.

In absence of safeguards against shocks, fisher households above the poverty threshold are pulled down; and those who are already below it experience further slippage (Hye 1996). Due to their distance from public facility hubs, fishing communities along the coast are usually the last to gain from economic development. There are critical food shortages, particularly after a cyclone; erratic production exhausts fishers' savings and entraps them into debt. Sometimes, in order to receive assistance such as cash or ration cards for food, they would even have to bribe the local government official concerned.

5.4.3 Access to Land and Infrastructure

Most of the surveyed households (more than 90% in the case of Mothurapur) are landless. They live on *khas* (government owned) land or on land owned privately by someone else. Thus, they are cut off from enjoying the insurance that ownership of land (which Sen (1981) would call an "exchange entitlement") can offer against a sudden loss of livelihood resources. The few, who do possess land, only have a marginal quantity, which would not allow them to use it for generating additional income, only for family settlement. Poor infrastructure, remoteness, and poor transport facilities are inhibiting factors for access to development and mobilization activities. Another entitlement deficiency is the poor transportation system that inhibits fishers from easy and expedient access to the markets. During the rush period of peak fishing, it is not feasible for fishers to sell their catch in the market directly (as it involves further time and labor from already tired fishers); so instead, they sell the fish at coastal landing sites. Notably, poor transportation facilities pave the way for the buyer, or the *dadondar*, to gain bargaining power over them.

5.4.4 Gender Perspective of Fishers' Poverty

The burden of poverty tends to bias toward women, especially female-headed households. Women from poor households and female-headed households are forced to involve in income-generating activities outside the home for their livelihoods. Almost all the interviewed fisherwomen in Mothurapur village were found to sell their labor in fishing activities. About one-fifth of the women did or do work outside fisheries where they often face the hardest conditions, such as hard physical work, e.g., digging ditches and maintenance of roads. Female-headed households tend to have a higher frequency of food insecurity, and their livelihoods and coping capacities are

constrained by low education, poor skills, and low earning ability. Thus they usually earn less than their male counterparts. However, women participate in the fishery sector as processors, packers, and vendors. They are, in many instances, the financial mainstay of the fisher household. Although women in fishing households increasingly become active in income generation, they still face discrimination on the job. Although women claim that they do the same laborious job that men do, in the Sundarbans area, they are usually paid 70% of the wage from what men earn.

Another burden on the household is the substantial dowry required when a daughter marries.³ The dowry exists from ancient times as a well-known matrimonial custom in traditional Hindu communities, which also includes Hindu fishing communities (Rahman et al. 2002). It is now also widespread in other communities. More than 90% of the households interviewed in three areas have said that they have to pay dowry either in cash money or in-kind. Most households consider dowry as something that has entrapped them into debt, as most of them had to take a loan either from an NGO or from a money lender.

5.4.5 Political Processes, Local Institutions, and Social Networks

Fisher households are less involved in political processes and local institutions, for instance, the Union Council.⁴ Elected local government officials of the Union Council are perceived to be blind to the problem of fishing communities, just as they are to the welfare concerns of the fishing community in general. One fisher from the Chittagong district complained about a local government representative:

They just come to us when they need our votes for election. After being elected, they just forget about us. Even when the police harass us in front of our commissioner (i.e. the local administration official), he doesn't protect us. We are unable to elect our own representative as we do not have power and money. We do not even have a suitable candidate from our own community because we are all illiterate.

In general, the small-scale fishers of the study areas are, for the most part, unorganized. The existing traditional organization (*samaj*) is not effective enough to promote their interests, and they have poor representation in the local administration of the Union Council. Well-off fishing households are often found to have strong social ties to rich people and influential persons involved in politics, while the poor have very few such networks. However, having such social networks is important for drawing benefits from state and private resources, and making better use of local opportunities (Rahman et al. 2009).

³*Dower* (paid by the husband to his wife) is an essential part of Muslim marriage as practiced in Bangladesh. However, dowry is prohibited by state law. The problem of dowry is now widespread. The practice of dowry increases the vulnerability of women in Bangladesh, turning them into liabilities for the families (Chowdhury 2010).

⁴The Union Council is the lowest layer of local government administration where the Chairman and members of the council are elected by public vote.

In the three communities, therefore, there is a clear correlation between possession of financial, physical, and social capital (see also Rahman et al. 2009). Social capital, which includes relationships with local level institutions such as the Union Council is important as a coping asset, as material and non-material benefits can be derived from these institutions. However, the poorer the households, the less connected they are to such networks, and the fewer assets they have to deal with their problematic livelihood situations.

5.4.6 *Human Capital and Capabilities*

A number of additional entitlement shortages limit the opportunities of poor small-scale fishers, and increase their vulnerability. Sen (2002) observes that, “health is one of the most important conditions of human life and a critically significant constituent of human capabilities which we have reason to value” (p. 660). In the study areas, frequent bouts of illness often impair fishers’ capability to work. The cause of the most prevalent illnesses can usually be linked to the lack of knowledge about, and access to, proper sanitation. Though sanitation facilities are reaching around the countryside due to government and NGO assistance, fishing villages are among the few communities where most households still lack water-sealed sanitary latrines. Illness, especially among the earning members, is one of the major causes of families getting pushed into poverty. It often leads to family bankruptcy, which may even bring additional health problems because the cost of medicine is often paid by reducing the frequency of meals or, in extreme cases, with the starvation of family members. As expressed by a key informant in Chittagong:

Fishers spend a large portion of their earnings buying medicine. It is unlikely that all the members of a family are in sound health at the same time. They are uneducated about general sanitation rules, and for that they suffer.

Fishers are considered to be more prone to alcoholism than other people in Bangladesh. They spend a lot of what they earn during the peak fishing season on alcohol. A number of key informants also blamed fishers for lacking the habit of saving. As a local proverb says, “*Jailla, dangai utle khhailla* - fishers earn money in the sea. When they come to land, they come empty handed.”

As in many other rural communities in Bangladesh, the rate of illiteracy in fishing communities is very high. At the maximum, the children of fishing households go to school at least once in their life, but the drop-out rate is about 80% before completing 5 years of primary schooling. The present survey reveals that the literacy rate at 7+ years of age is around 30%, which is below the national average. Early drop-out of school-aged children from fishing households is common. One reason is that fishing is very labor intensive, and fishers cannot afford to take manpower from outside the household to allow the children to attend school. Seasonal and uneven income from fishing is not conducive to bear the regular costs for education. Failure to pay school fees regularly makes the students ashamed and many leave school.

5.4.7 *Market, Money Lender, and Dadon System*

There is the potential to avert poverty in small-scale fisheries, as fish is a highly priced product in comparison to other agricultural products in Bangladesh. However, a good catch does not ensure a good price of fish products for fishers. Hilsha fish enjoy lucrative domestic and foreign market prices, but their distribution disfavors small-scale fishers. Ali (2010), in a recent study, found that there are eight layers of middlemen from the fishers to the consumer table in the Hilsha marketing channel, and that fishers only get 1.5% of the final consumer price. However, in absence of a sound marketing system in general and effective state monitoring, this type of an exploitative fish marketing chain seems to persist.

Fishers' access to the formal credit markets (i.e., banks) is very limited due to lack of, or insufficient collateral assets like landed property. Therefore, they are dependent on informal credit mechanisms, like the *dadon* system. This informal arrangement is often blamed for exploiting the fishers. *Dadon* is a transaction built upon a verbal contract between the fisher and the money lender (called *dadondar*) - whereby the lender requires that the fisher sells the fish to him; or he gets a certain commission when fish is sold to a third person. Thus, the *dadon* system binds the fishers to the money lender in a debt cycle. Regardless of the amount of money owed, the borrowers must give all the fish they catch to the *dadondar* who determines the price of the produce (or a commission that ranges between 5% and 10% of sales revenue) (Habib 2001; Kleih et al. 2003).

One fisher from Chittagong complained during an interview that if he tries to bargain, the *dadondar* punishes him by reducing the previous bid. The *dadondar* usually allows at least three fishing seasons for the loan defaulter to repay loans. If there is a failure, he may confiscate the fisher's productive assets like boats, nets, home, or homestead land. Thus, the *dadondar* sometimes becomes the *de facto* owner of the family's productive assets and fish catches. A fisher interviewed by Alam (1996) said: "*Dadon* means selling everything to the Paiker (a word for money lender). It is not only your fish but also your freedom, boats, nets etc. But we have no way of being free from it" (p. 109). The exploitation within the *dadon* system occurs mainly within the Hilsha fishery; which requires huge investment to prepare nets, and boats suitable for fishing. Most fishers cannot afford such expenditures; so, therefore, they have to go to money lenders.

5.4.8 *Migration and Alternative Livelihoods*

Along the Chittagong coast, migrant fishers come mainly from nearby Noakhali or the Bhola and Barisal districts during the Hilsha fishing season. Most migrant fishers are either seasonal fishers, or work in agriculture in their place of origin. They migrate to the Chittagong coast during the rainy season when there are no agricultural activities where they live. Lack of productive assets is one of the factors

pushing fishers (e.g., fishers of Thakurtala) to migrate elsewhere (e.g., to Chittagong) along the coast. In Chittagong, they are usually hired by local elites or *dadondars*. Migrant fishers go deep sea fishing for Hilsha, whereas local fishers usually catch Hilsha nearer to shore. Local boat owners also prefer to hire migrant fishers whom they perceive to be more experienced and skillful in deep sea fishing than locals.

This specialization of fishing between migrants and locals helps to avoid conflict between the groups, which may otherwise easily escalate. Most migrant fishers, who also work in agriculture, are found better off than the local fishers who rely only on fishing. Therefore, migrants are not always welcomed by local fishers, especially when migrant and local fishers are fishing in the same fishing ground. Still, as one migrant fisher in Selimpur said: “Migration is our right because the sea is for all and it is not the private property.” Part of the problem is that locals see that migrant fishers contribute to their rent dissipation. Another issue is that they weaken their bargaining power with the *dadondars*. Furthermore, one local fisher from the Chittagong district complained that, “migrant fishers buy accessories that we need for boats and nets, and thus the price increases. Then we have to buy with extra price.”

As a hereditary profession and habit, many fishers do not want to leave fishing. Some even think that it is their “holy duty” to feed mankind with fish. Fishing is not only a means for maintaining livelihoods. It is an interesting, challenging, and independent profession. However, for those who want to change and pursue alternative livelihoods, there are many obstacles. Fishing skills are not easily converted into other professions, and living in remote communities means little opportunity for developing other skills. The few existing alternate job opportunities (e.g., day labor, van puller) return less income than fishing. Habituated to large income during the peak season, fishers do not intend to work for less money, even during the lean season.

Summing up, vulnerability is the central theme when studying poverty and livelihoods in small-scale fisheries of Bangladesh. Vulnerability and poverty are closely but not the same. Natural disasters are frequent and hard to escape. When their assets are destroyed, small-scale fishers have to rebuild their lives. Most small-scale fishers also depend on the Hilsha species, which means risk of livelihood failure in the case of stock failure. The lack of alternative skills keeps fishers trapped in resource dependency. This can lead them to increase the pressure on the marine ecosystem, often by using destructive gear or targeting undersized species (to be further described in the following section). Fishers’ access to the formal credit market (i.e., banks) is very limited due to lack of collateral assets like landed property; therefore, they are dependent on informal credit mechanisms, like the *dadon* system. The poverty averting potential that high market prices of fish products involve tends to be eroded, as middlemen control price setting. Small-scale fishers’ vulnerability is also exacerbated by social mechanisms, such as underperforming institutions, and lack of the security that ownership to land provides. Without a functioning health care and welfare system, the death or illness of a family member may be disastrous. In many instances, fishers’ livelihoods are also exposed to maltreatment by middlemen or government officials who often take advantage of them. Thus, all in all, small-scale fishers lack the “protective security” which Amartya Sen considers a basic instrumental entitlement (Sen 1999, p. 184–185).

Table 5.1 Factors that contributed to fishers' vulnerability, and the coping strategies to redress vulnerability

Factors contributing to vulnerability	Coping strategies to redress vulnerability
<ul style="list-style-type: none"> • Dependency on single species (e.g., Hilsha, shrimp or prawn larvae) • Seasonality and fluctuation of natural resources • Extreme weather conditions e.g. cyclones, and coastal storms • Human-tiger conflicts • Piracy and other unlawful activities • Landlessness and settlement in areas exposed to coastal disasters • Death of bread-winners and female-headed households • Dowry • Lack of access in political processes and local institutions • Market vagaries and fishers' limited capacity to bargain • Lack of access to the formal credit system 	<ul style="list-style-type: none"> • Fishing undersized species and using illegal fishing practice • Family bonding – by sharing responsibilities, and jointly contributing to the family income • Social networking – borrowing money and taking help from other fishers and relatives • Women's role in income generation • Patron–client relationship with money lender, extortion and protection money to pirates • Alternative activities outside of fisheries • Migration and remittance from abroad

The factors that contribute to the vulnerability of fishers are summarized in Table 5.1. Table 5.1 also contains a summary of the coping strategies that fishers employ to redress vulnerability. These are described in detail in the following section.

5.5 Coping Strategies to Redress Vulnerability

Poor fishers cannot afford to be without income, or sit idle for long periods of time. Hence, they develop ways of coping with the changing conditions and vulnerabilities as they experience. The following are the coping strategies adopted by fishers of the study areas in order to enhance their livelihoods: (1) Enhancing resource exploitation; (2) Family bonding; (3) Social networking; (4) Women's contributions; (5) Patron-client relationships; (6) Job diversification; (7) Migration and remittance. Each of these coping strategies are addressed in more detail below.

5.5.1 Enhancing Resource Exploitation

In order to address the series of vulnerabilities and liabilities that fishers experience and the poverty that they face, they ultimately cope in a way they are capable of, that is by putting more pressure on the common pool of marine resources. Some of these



Fig. 5.2 Set Bag Nets (SBN) are extensively use in the rivers and canals of Sundarbans Mangrove Forest. This fine-meshed net is used to collect post larvae (PL) of shrimp and prawn

coping strategies only exacerbate vulnerability by depleting the resource base further. There are several signs that this is happening. For instance, the small meshed set bag net widely used by small-scale fishers along the coast of Bangladesh has been blamed for catching undersized fish. Fishers generally do not follow the restriction on mesh size of the cod end of ESNB imposed by law; thus mesh size of the cod end is getting smaller to capture more undersized fish. Many species (including Hilsha) are also targeted during the breeding season. Illegal fishing (e.g., catching of *Jatka* – the juvenile species of Hilsha), and the use of illegal gears (e.g., monofilament fishing nets) are also widespread. According to Khaled (2010), every year about 463 million *Jatka* (3,707 tons in weight) are caught using different types of nets including monofilament nets. By saving 20–30% of *Jatka*, an additional 0.10 million to 0.15 million tons of Hilsha production would be possible.

Fry collection (of very juvenile prawn and shrimp species) is the main occupation of women and young girls of Mothurapur, despite a ban on collection of wild fry. From a literature review, Ahmed and Troell (2010) find that, compared to any other fishery, it is assumed that prawn and shrimp fry collection have the highest by-catch rate (Fig. 5.2) and each year more than 98 thousand million juvenile fish and crustaceans are lost.

All in all, these coping strategies have detrimental impact on the marine ecosystem, and the resources that small-scale fishers depend on for their livelihoods. But fishers are also in a desperate situation where they need to survive and pay their bills on a daily basis.

5.5.2 *Family Bonding*

Family bonds are an important aspect of livelihood security. Therefore, fishers' households first cope with vulnerability through family cooperation. Reducing food

consumption or simply skipping meals are the immediate strategy when there is a crisis. Especially women prefer to eat less rather than selling productive assets, which is a second strategy. In most cases, the fishing crew is from the same family (e.g., father and sons or brothers), as recruitment from outside the family involves payment, even if there is no catch. When the father gets too old to fish, the son usually takes over the skipper position. The father retreats to some easy job on land like net making or mending. In most cases, sons take care of parents when they grow old. Children also help out. Due to the high risk, fishers in the Sundarbans need to bring a crew of more than one person. Usually, children accompany their parents during fishing in the forest. Along the south-eastern coast, children do not go fishing in the sea. They do individual fishing along the coast to catch shrimp fry, or work in the fish landing center. Many children collect fish either by asking fishers, or they collect fish that are discarded, which allows them to earn around 50 cents to \$1 per day.

5.5.3 Social Networking

Existing informal social networks and solidarity among fishing people are strengthened by working together. Fishers always live together in fishing helmets locally termed *samaj*. The *sarder* is the village head, whose role is to help settle disputes among fishers. He always tries to solve problems within the group, before going to the police. The latter costs money and often involves harassments. The fishers who live together usually also fish together in the same fishing zone. Partly, this is done for safety reasons. Most women replied that they first seek a loan from those who live next door in the form of daily necessities like rice, salt etc. The dowry needed for a girl's marriage from a poor family is often raised with the help of relatives. In the case of a widow or a woman-headed household involved in fish marketing, she can get fish on credit from a kin fisher and pay back after the fish is sold; thus she may not need to invest cash.

5.5.4 Women's Contributions

Fisherwomen also have some reputation for preserving the savings culture more than fishermen. They often save money in secret as insurance against misfortune. The women's supplemental income is gained through, for instance, rooftop or yard gardening. Some have jobs in marketing of fish or fish drying, whereas others provide funds for their family by net making and mending. In the Sundarbans area, almost all women (and most young girls) in fishing families are active in income generating activities, mainly shrimp and prawn fry collection. Thus, women have, in some instances, become the financial mainstay of the fisher households. Many young girls from fishing households in the Chittagong area work in readymade

garment factories, or in the Export Processing Zone. Some women also raise poultry and other livestock as an investment. This comes into use to meet daily needs during the lean periods, or to overcome sudden shocks like illness that involve extra expenditures.

5.5.5 Patron–Client Relationships

The patron-client relationships that fishers have with *dadondar* (or money lenders) are generally perceived as exploiting the fishers. Still, it also makes a vital contribution to fisher's security. In the Chittagong district, the peak fishing period for Hilsha starts after 2 months of want and scarcity. During this period, fishers need money for preparations, net mending, the maintenance of boats and engines, as well as for subsistence (Habib 2001). During this period, *dadondar* supply fishers with the money they need to maintain their livelihoods. Money is provided on trust rather than by written document or for collateral property. Social security is also provided by *dadondar*. During any mishap, they help fishers, for instance, to get legal aid. For a fisher to have a relationship with the *dadondar*, means proper and timely marketing and payments for his products (even though the price is low). If a fisher has no permanent *dadondar*, his product may be targeted by several *dadondars* to buy, which may result in mishandling, improper, and uncertain payments (Alam 1996).

5.5.6 Job Diversification

Most fishers want to cling to their hereditary profession. Those who want to diversify their income-base usually allow a son or daughter to find alternative jobs and encourage their wife to do homestead income generating activities (such as gardening) or some job related to fishing like net mending or net preparations). Such job diversification by family members also helps to redress vulnerability, as loss of one member's income can be compensated by another's. About 70% of ascending households have at least one earning member who does not fish. It appears that occupational diversification, especially the capacity to switch from lower-productivity fishing activities to higher productivity non-fisheries activities, plays a crucial part in the process of escaping from poverty and vulnerability. Income from alternative jobs or income from household savings may serve as working capital for another family member.

5.5.7 Migration and Remittance

In some cases, like for fishing families in the Chittagong, remittances sent by family members from abroad are found to help families getting out of poverty. However,

migration (for doing the same fishing job in other areas) is less common for traditional Hindu fishing communities of the study areas (except Moheshkhali). However, there are some cases in Selimpur where fishers also migrate for work outside of fishing, thus contributing with remittances to the family. However, fishers from other areas usually migrate to Chittagong during the Hilsha fishing season. In Moheshkhali, Hindu fishers who do not have their own boat and net are found to migrate to the Chittagong coast to work as hired fishers in the Hilsha fishery. For migrant fishers along the Chittagong coast, income from the Hilsha fishery is a means to cope with family expenses (e.g., earned money used to repay loans taken during crisis periods).

Although there is also some inward migration in coastal areas by poor people from other parts of the country who are in search of a job, outward migration by young members from fishing households in Selimpur into the city of Chittagong is very prevalent. This outward migration is largely facilitated by the close proximity (20 km in distance), alternative job opportunities in the city, as well as a willingness to leave because of dwindling fish resources. In the Sundarbans area, permanent outward migration is limited, as most fishers find it difficult to find alternative jobs in the city, or because they lack “migration capital” (e.g., costs related to travel, settlement in the city, subsistence cost for the family for the period of absence).

5.5.8 Summary of Coping Strategies

To sum up, small-scale fishers of Bangladesh develop a range of coping strategies to shield themselves from a host of vulnerabilities. Some of these coping strategies only exacerbate their vulnerability by depleting the resource base they depend on. This includes exploitation of fry and juvenile species with high by-catch, and use of destructive fishing gears. Some other coping strategies create buffers against crises. Fishers create a family network by sharing their responsibilities and joint contributions to family income; providing non-material or moral support during the periods of crises. Women are not passive beneficiaries of men’s income in a family. Rather, they are active with diverse alternative income generating activities. In many cases, fishing alone is not sufficient to sustain livelihoods; so, fishers do ancillary or alternate jobs. Women are, however, more active in the search for alternative jobs than fishermen who tend to cling to their occupation. In the absence of “protective security” (Sen 1999), many fishers take refuge in money lenders when they face difficulties. Money lenders can also provide security during livelihood crises. Even though migration is considered as an ultimate coping strategy, outward permanent migration in the study areas seems not to be very pronounced, as fishers do not migrate permanently. Seasonal inward and outward migration occurs to reap the benefits of peak fisheries production of other areas.

5.6 Reducing Vulnerability: Breaking the Circle of Poverty

In a study of rural poverty in Bangladesh, Sen (2003) found that the households who escape poverty tend to accumulate natural, human, physical, and financial assets faster than non-ascending households. This, he attributes to their ability to diversify into other income and sustenance sources. They allocated more investment into non-agricultural activities on land. In general, they displayed strong non-agrarian orientations by engaging in alternative activities such as trade, service, migration (remittance), and non-agricultural labor.

In the present study, it was also observed that to avert poverty, small-scale fishers tend to better utilize the natural, human, physical, social, and financial capitals that they have access to (Table 5.2).

Table 5.2 Fishers' perceptions of the drivers of poverty

Assets	Factors averting household poverty	Reasons for deteriorating household income
Natural assets	<ul style="list-style-type: none"> • Good income from peak season fishing • Income supplement from other sources than fishing (e.g., forest resources) of nearby areas 	<ul style="list-style-type: none"> • Low productivity of fisheries • Natural disasters
Human assets	<ul style="list-style-type: none"> • Family head skilled and industrious • Women's mobility for work • Development of skills through education • Family members work outside of fishing jobs • Small household size 	<ul style="list-style-type: none"> • Low level of education or no formal education • Death of earning family members • Women without work • Family illness • Alcoholism among family head or other members • Big household's size • Lack of motivation • Fatalism
Financial assets	<ul style="list-style-type: none"> • Self insurance through savings • Frugality, endowment to land • Remittance 	<ul style="list-style-type: none"> • Lack of financial assets (e.g., owningboats, nets) • Exploitation by <i>dadon</i> system • Erratic income, habit of lack of savings
Physical assets	<ul style="list-style-type: none"> • Income diversification through gardening, agriculture • Direct marketing facility of good time catch • Well connected by road 	<ul style="list-style-type: none"> • Lack of direct fish marketing due to poor infrastructure • Unavailability and/or limited alternative activities
Social assets	<ul style="list-style-type: none"> • Good family network • Cooperation between relatives • Cooperation between communities 	<ul style="list-style-type: none"> • Dowry problem during girl's marriage • Unlawful elements (e.g., piracy, extortion etc.)

5.6.1 *Changes in Natural Assets*

For most coastal communities, who depend on natural resources, changes in the natural capital particularly impinge on their vulnerability (Kleith et al. 2003). So productivity in the fishing grounds have direct bearing on the poverty status of fishing communities as primary sources of income. As fish and shrimp are always commodities of higher market price in comparison to most of the other agricultural products, availability of fish and getting appropriate price always holds potential for poverty alleviation in fishing communities. Good income from Hilsha fishing is a key factor for many families in Chittagong for bringing them out of poverty. In the Sundarbans area, those fishers who are involved in crab collection can earn a good income; fishers can also supplement their income from wood and non-wood forest resources. Natural disasters are found to be the most prominent factors that drive fishers to abject poverty by wiping out the livelihoods base.

5.6.2 *Changes in Human Assets*

According to Sen (2003), a declining demographic dependency ratio⁵ had positive implications for rural income growth and poverty reduction. In the present study, a considerable number of fishers are aware and adopt a family planning program to curb family size. Despite the significant progress in curbing the growing number of members in poor fishing households, the dependency ratio is considerably higher compared to other groups or classes. In the present study, it was found that the burden of children and elderly were greater in poor fishing households than in more well-to-do families.

The present study also confirms the findings of Ellis (1998) that education and development of human skills are among the factors that help people to cope with social and ecological change. It also helps people to find alternate livelihood options more easily. As Ellis argues: “Since poverty is closely associated with low levels of education and lack of skills, education is also a key factor contributing to the greater ability of better off families to diversify compared to poorer families” (Ellis 1998, p. 27).

As noted in Table 5.2, human capital also plays an important role in the transition of ascending fishing households. Fishers escaping poverty have at least primary education of a few years, or some other family members have it. There is often the opportunity to take part in awareness raising or extension programs by the government or by an NGO. An educated skilled family member can serve as a buffer against vulnerability by qualifying for a job outside of fishing. In the Chittagong district, women work in the garment industry, which helps the family to raise their income. This is particularly helpful during the lean fishing periods. In terms of human assets,

⁵The dependency ratio is calculated by dividing the total number of dependent members by the total number of earning members of each family (Rahman et al. 2002).

descending or chronically-poor fishing households suffer different levels of illiteracy, death of earning members, and widowhood, leaving them without viable sources of income. Family illness and alcoholism lead to further slippage into poverty.

Individual attributes make a crucial difference in poverty levels in fishing households in the same fishing communities. The level of poverty may differ among fishers working on the same boat, like among crew members or more significantly between a crew and skipper. The crew who becomes a skipper can, for the most part, change their fate and get out of poverty; whereas the other crew usually remain poor. But moving from crew to skipper is rather demanding for most of them. One key informant from Chittagong said:

Those crews who will become skipper in the future depend on entrepreneurial skills, hard labour, and high aspirations.

5.6.3 Changes in Financial Assets

To most of the fishers, lack of financial assets, for instance, cash money is synonymous with poverty. For fishers who have very few collateral assets, other financial assets serve as informal insurance against sudden shocks or risk. Similarly, Sen (2003) found that households of rural Bangladesh who ascended from poverty had higher access to institutional credit than both the chronic poor and the descending households. His finding suggests that access to financial capital is an important element in the process of moving out of poverty. The poor fishers mainly lack capital needed for investment in productive assets, e.g., boats or nets, as their income always falls short of meeting running costs and investment needs of their fishing operations, as well as of their daily household consumption. They do not have access to formal institutional credit, and have to rely on the informal *dadon* system which binds them in a relationship of dependency and poverty, which they have problems to free themselves from. It is evident that households who have some agricultural land (“investment capital”) are better diversifiers than landless fishing households.

The few fishing households who have both homestead and agricultural land are mostly found to graduate from poverty. Moreover, to address the seasonality of fishing and the vulnerability of livelihoods, ascending households were able to invest in various fishing gears, which allowed them to spread the risk. They tended to have several types of nets for different fishing seasons and fish species, and this makes them able to switch target species easily, thus utilizing the full productivity of the productive assets. Moreover, once one fishing gear is lost or destroyed, they can sustain their livelihoods by utilizing another one.

5.6.4 Access to Social Network, Market and Information

Many fishers feel that existing informal social network and solidarity strengthened by working together are the most instrumental for livelihoods and can act as a buffer

against vulnerability. Those fishers who go fishing jointly with other fishers (e.g., shore seining in the case of the Sundarbans) are found to be in good condition. Fishing together with the same fishing gear and craft helps to improve welfare conditions by risk spreading, sharing knowledge and skills for income generation. Fishers tend to help any new entrepreneur in the marketing channel by selling fish on loan. They help new entrepreneurs, because an inclusion of a new person in the marketing channel will increase competition among the middlemen; thus fishers may get better prices in a competitive market. Furthermore, close proximity to market and other ancillary services such as fish landing and processing facilities, tools and facilities allow fishers to bargain for proper price of their products.

There are sufficient anecdotal and replicated examples that demonstrate that access to information is one of the factors that can help to improve incomes and help to empower the poor (Greenberg 2005). The present study also provides the evidence that use of mobile phones may inform of rich fishing grounds and markets. For instance, news of a bumper catch in certain areas can be relayed to other fishers to come and reap the fish available.

5.7 Conclusions

The meaning of poverty may be instinctively clear, but its measurement is complex (Adams et al. 2004). Monetary income is not the only significant variable that explains economic and social deprivation in a fishing community. Hence, it is vital to develop a framework to guide poverty research to understand both the complexity and drivers of poverty that will help in developing the adequate policy response at scales appropriate to the context-specificity of many drivers of both poverty and resources degradation, as poverty is a changing phenomenon (Thorpe et al. 2007).

An FAO (2007) policy document claims that both sustainable fisheries and goals related to poverty reduction can be more readily achieved by reducing fishers' vulnerability and strengthening their basic human rights. This claim is also consistent with the findings presented in this chapter. In my study of small-scale fishing in three coastal communities in Bangladesh, people are indeed vulnerable; and several conditioning variables are identified as affecting how people are able to deal with it. The policies needed to reduce poverty in small-scale fisheries must also address these factors. Different livelihood crises and natural hazards put small-scale fishers in Bangladesh on the margin of destitution, where any further shocks or crises can lead to livelihood failure. Thus, for sustainable livelihoods of poor fishers of Bangladesh, it is urgent to create buffers against vulnerability and crises. A resource management system that works to sustain the resource base is essential, but is not the only necessary remedy.

One mechanism for building such buffers is the development of human capital through investing in education. In the present study, fishers' literacy rate lags behind the national average. By providing global scale evidence, Psacharopoulos (1994) shows that education has a strong positive return. He observes that primary education will continue as the number one investment priority in developing countries, and

that investment in women's education is, in general, more profitable than that for men. Thus, he concludes that, "investment in education continues to be a very attractive investment opportunity in the world today - both from the private and the social point of view" (p. 1325).

This evidence is clearly supported by the empirical findings of the present study. Fishers who have some basic education prove to be more resilient in times of crisis by having more capability to avail alternative livelihood options. Exploring the benefits of education, Bebbington (1999, p. 2034) thus argues that:

The individual's ability to read and write not only enhances likelihood to secure better jobs and more efficient performance - it also enhances his or her ability to engage in discussion, to debate, to negotiate, to add their voice to the multitude of voices influencing households, local and national discourses on development and other issues.

In the same way, fishers with basic education can improve their position in marketing channels or as a skipper, where most of the profits from fishing activities accrue.

The same is the situation if family members like daughters go to primary school. Women who receive primary education will more easily find a job outside the household (like in a garment factory) than women without education. Sen (1999) also explores the crucial role of female education, female employment, and female ownership rights for the economic fortune, well-being, and freedoms of family members. Thus, poverty alleviation strategies and policies for fisheries communities should not only target the fisher, but aim at uplifting the women and the contributions they make.

Poor fishers' lack of capital for initial investments in acquiring any productive assets is another cause of vulnerability. Most small-scale fishers of Bangladesh live on the margin of survival; rarely do they have any money to save after meeting consumption costs. The existing informal *dadon* credit system severely limits the economic freedom of fishers by binding them into long-term exploitative debt bondage. Thus, access to the formal credit systems will create economic opportunities for them, and is therefore something development policies should aim for.

In Bangladesh, as in most other settings, social bonding is traditionally embedded in the local community. The effective utilization of this social capital can play an important role in reducing vulnerability. As Snowden (2005) argues, social capital reduces community distress. However, the existing *dadon* system in fishing communities has shifted the traditional kinship arrangement into one of patronage, and has thus shrunk considerably the scope of social capital. The patterns of traditional social bonding can only, to some extent, help people to survive in times of crisis; and are not effective in lifting them out of poverty. Most fishing communities suffer from lack of organization; they have no cooperative organizations. Such organizations may provide an effective buffer against crisis, as organizations serve as cushions to shocks and stress, and would therefore be an obvious thing to create in order to reduce vulnerability (see Amarasinghe and Bavinck, Chap. 17 and Salas et al., Chap. 10).

Good communication in terms of information and social networks, and access to markets not only help to ensure a proper price of products, but also determines access to education, information regarding the labor market and other social services. Building of human capital through access to health service and training or

extension services also has a very positive impact on livelihood security. However, there is no single route that is sufficient to achieve such development goals. In a similar vein, large stocks of one single asset are also of little use, as it is rather the right mix of different assets that creates an effective buffer against crises (Kasperson et al. 2010). Given the multiple dimensions of poverty and vulnerability, a combination of different strategies as those mentioned here is essential, and should therefore be supported also by outside interventions.

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References

- Adams WM, Aveling R, Brockington D, Dickson B, Elliott J, Hutton J, Roe D, Vira B, Wolmer W et al (2004) Biodiversity conservation and the eradication of poverty. *Science* 306:1146–1149
- Agarwal B (1990) Social security and the family: coping with seasonality and calamity in rural India. *J Peasant Stud* 17(3):341–412
- Ahmed N, Troell M (2010) Fishing for prawn larvae in Bangladesh: an important coastal livelihood causing negative effects on the environment. *Ambio* 39:20–29
- Alam QK (1996) Two fishing villages of Bangladesh: a community study. Ph.D. thesis, Aalborg University, Aalborg
- Alam MF, Thomson KJ (2001) Current constraints and future possibilities for Bangladesh fisheries. *Food Policy* 26:297–313
- Ali SMZ (2010) Supply chain and prices of Hilsa fish in Bangladesh. Bangladesh Institute of Development Studies (BIDS), Dhaka. <http://www.bdnews24.com/details.php?id=155054&cid=2&aoth=1>. Accessed 4 Mar 2010
- Bangladesh Economic Review (2008) Agriculture. Finance Division, Ministry of Finance, Government of the People's Republic of Bangladesh, chap 7
- BBS (2007) Statistical yearbook of Bangladesh. Bangladesh Bureau of Statistics, Statistics Division, Ministry of Planning, Government of the Peoples Republic of Bangladesh, Dhaka
- Bebbington A (1999) Capitals and capabilities: a framework for analyzing peasant viability, rural livelihoods and poverty. *World Dev* 27(12):2021–2044
- Beck T, Nesmith C (2001) Building poor people's capacities: the case of common property resources in India and West Africa. *World Dev* 29(2):119–133
- Béné C (2003) When fishery rhymes with poverty: a first step beyond the old paradigm on poverty in small-scale fisheries. *World Dev* 31(6):949–975
- Béné C (2006) Small-scale fisheries: assessing their contribution to rural livelihoods in developing countries. FAO Fisheries Circular No. 1008. FAO, Rome
- Béné C (2009) Are fishers poor or vulnerable? Assessing economic vulnerability in small-scale fishing communities. *J Dev Stud* 45(6):911–933
- Bohle H-G, Downing TE, Watts MJ (1994) Climate change and social vulnerability: toward a sociology and geography of food insecurity. *Glob Environ Change* 4(1):37–48
- Bosher L (2007) A case of inappropriately targeted vulnerability reduction initiatives in Andhra Pradesh, India? *Int J Soc Econ* 34(10):754–771
- Bosher L, Penning-Rowsell E, Tapsell S (2007) Resource accessibility and vulnerability in Andhra Pradesh: caste and non-caste influences. *Dev Change* 38(4):615–640
- Chambers R (2006) Vulnerability, coping and policy (Editorial Introduction). *IDS Bull* 37(4):33–40

- Chowdhury FD (2010) Dowry, women, and law in Bangladesh. *Int J Law Policy Family* 24(2):98–221
- Colavito L (2002) Wetland economic valuation using a bio-economic model: the case of Hail Haor, Bangladesh. Paper presented at a workshop on conservation and sustainable use of wetlands: learning from the world. IUCN-The World Conservation Union, Kathmandu
- Ellis F (1998) Household strategies and rural livelihood diversification. *J Dev Stud* 35(1):1–38
- FAO (2007) Social issues in small-scale fisheries. COFI/2007/6, Committee on Fisheries Twenty-Seventh Session, Rome, 5–9 Mar 2007. <ftp://ftp.fao.org/>
- Greenberg A (2005) ICTs for poverty alleviation: basic tool and enabling sector. ICT for development secretariat, Department for Infrastructure and Economic Cooperation Sida. <http://www.eldis.org/fulltext/sidaictpoverty.pdf>. Accessed 22 April 2008
- Habib A (2001) Delipara: an obscure fishing village of Bangladesh. CODEC, Chittagong, Bangladesh
- Hye HA (1996) Below the line: rural poverty in Bangladesh. University Press Limited, Dhaka
- Kabir SMH (2006) Hilsha. In: Islam S (ed.) *Banglapedia: national encyclopaedia of Bangladesh*. Asiatic Society of Bangladesh, Dhaka. http://www.banglapedia.org/httpdocs/HT/H_0123.HTM. Accessed 21 Mar 2010
- Kasperson JX, Kasperson RE, Turner BL II (2010) Vulnerability of coupled human-ecological systems to global environmental change. In: Rosa EA, Diekmann A, Dietz T, Jaeger C (eds.) *Human footprints on the global environment threats to sustainability*. MIT Press, Cambridge, pp 231–294
- Khaled MH (2010) NGOs-stakeholders collaboration needed to raise Hilsa production. http://www.thefinancialexpress-bd.com/more.php?news_id=96762. Accessed 24 Apr 2010
- Kleith U, Alam K, Dastidar R, Dutta U, Oudwater N, Ward A (2003) Livelihoods in coastal fishing communities and the marine fish marketing system of Bangladesh. Natural Resources Institute (NRI) Report No 2712. University of Greenwich, London
- Narayan D, Chambers R, Shah MK, Petesch P (2000) *Voices of the poor: crying out for change*. Oxford University Press, New York
- Psacharopoulos G (1994) Returns to investment in education: a global update. *World Dev* 22(9):1325–1343
- Rahman MM, Haque MM, Akhteruzzaman M, Khan S (2002) Socio-economic features of a traditional fishing community beside the Old Brahmaputra River, Mymensingh, Bangladesh. *Asian Fish Sci* 15(4):371–386
- Rahman MM, Chowdhury ZA, Sada MNU (2003) Coastal resources management, policy and planning in Bangladesh. In: Silvestre G, Garces L, Stobutzki I, Ahmed M, Valmonte-Santos RA, Luna C, Lachica-Aliño L, Munro P, Christensen V, Pauly D (eds.) *Assessment, management and future directions for coastal fisheries in Asian countries*. WorldFish Center Conference Proceeding 67, pp 689–756
- Rahman PMM, Matsui N, Ikemoto Y (2009) *The chronically poor in rural Bangladesh: livelihoods constraints and capabilities*. Routledge, Oxon
- Sen A (1981) *Poverty and famines: an essay on entitlement and deprivation*. Oxford University Press, Oxford
- Sen A (1999) *Development as freedom*. Oxford University Press, Oxford
- Sen A (2002) Why health equity? *Health Econ* 11:659–666
- Sen B (2003) Drivers of escape and descent: changing household fortunes in rural Bangladesh. *World Dev* 31(3):513–534
- Snowden LR (2005) Racial, cultural and ethnic disparities in health and mental health: toward theory and research at community levels. *Am J Community Psychol* 35(1/2):1–8
- Thorpe A, Andrew NL, Allison EH (2007) Fisheries and poverty reduction. *CAB Rev Perspect Agric Vet Sci Nutr Nat Resour* 2(085):1–12
- Yamin F, Rahman A, Huq S (2005) Vulnerability, adaptation, and climate disasters: a conceptual overview. *IDS Bull* 36(4):1–14

Paper II

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NEGOTIATING RISK AND POVERTY IN SHOCK-RIDDEN FISHING COMMUNITIES IN THE SUNDARBANS MANGROVE FOREST IN BANGLADESH

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ABSTRACT Small-scale fishers in Bangladesh face substantial risks due to their occupation and their geographical setting. Without any effective buffer against crises, recurring shocks and on-going risk exposure are major factors pushing fishers into poverty. Not all fishers experience these events in the same way, however, with some of them showing higher capacity to negotiate risks. In this study, we ask how fishers cope with shock, what factors differentiate them in their risk negotiations, and what implications these factors may have on poverty alleviation policy. On the basis of the study's findings, we posit that poverty alleviation in small-scale fishing communities in Bangladesh requires interventions that target not only risk minimization, but also the endowment of fishers with socio-economic capitals to help them handle varying degrees of risk and shocks. Such policy as, for instance, providing employment for fisherwomen or providing a basic social safety net, will increase the overall resilience and well-being of fisher communities.

Introduction

Sea fishing has long been considered a risky profession. Inshore fishers, for instance, face risks of storms surges and high waves, their fishing boats may capsize, or may smash on submerged sandbars in rough weather (Smith 1998). High occupational hazards such as accidents during operating gears in fishing operation (Lincoln *et al.* 2002), health risks such as disease and fatigue (Kissling *et al.* 2005; Lincoln *et al.* 2002), substantial variability in catch (Salas *et al.* 2011), market risks such as increases in fuel price (Andrade and Midré 2011; Edvardsson *et al.* 2011), and security and political risks such as theft of gears and crafts and conflicts (Béné and Friend 2009) reinforce this claim. The situation is likely to be further accentuated in the future by climate-related risks (Allison *et al.* 2009; Chuenpagdee and Juntarashote 2011). Poor fishers and their families in less developed and developing countries are more affected by most of these risks than those in developed countries because former have fewer means to deal with these adverse situations (cf. Sinha *et al.* 2002; Fafchamps 1999).

Cashdan (1985: 455) refers to risk as the probability that “an unpredictable loss will occur”. Shock, on the other hand, is the “manifestation of risk” (Hoogeveen *et al.* 2004: 4), or the “adverse events that lead to a loss of household income, a reduction in consumption and/or a loss of productive assets” (Dercon *et al.* 2005: 563). In Bangladesh, risks and subsequent shocks are perceived to be ubiquitous in the livelihoods of the coastal poor, but surprisingly few researchers have examined them. The understanding of the nature of these

risks, shocks and their consequences and existing responses is a necessary, though not sufficient, step to the design of immediate interventions strategies and a first step to establish effective social protection program (Hoddinott and Quisumbing 2010; Harrower and Hoddinott 2005). Dercon (2010) further posits that such understanding is crucial for designing appropriate long-term policy responses, like building safety nets. An investigation of the role that risks and shocks play in inducing vulnerability and poverty in people's livelihoods, and of the complexity of their risk negotiations, is therefore needed in order to fine-tune policies and interventions.

A study of risks and shocks in the context of small-scale fisheries in the Sundarbans mangrove forest is highly relevant because of the dangerous and insecure natural environment and the fact that nearly everyone is dependent on fishing as the main, if not the only basis for livelihood. Seasonality is a phenomenon that the fishing people need to navigate on a regular basis, while facing recurring natural disasters. Markets function poorly and social safety nets, even though present for a few, are not able to guarantee support when needed. Our early field observations of the fishing communities in this area revealed, however, that not all members in the fishing communities are exposed to risk and experience shocks in the same way. They also vary in how they can negotiate risks. Using a case study approach, we conducted an in-depth research in Sundarbans mangrove forest from November 2009 to April 2010, with a follow-up field visit in August 2011 to examine the following topics: i) the risks and shocks faced by the various members of the fishing communities in the Sundarbans; ii) the consequences these events have on their well-being; iii) how fishing households cope with risks and shocks; iv) the factors that foster coping mechanisms of some groups but inhibit those of others; and v) what can be done to enhance the coping capacity of the latter groups and to mitigate impacts on fishers due to risk exposure and subsequent shocks.

The paper is structured as follows. First, we conceptualize risks and shocks in the context of the well-being of individuals and households. Next, we describe data collection methods and the study areas, followed in section three by an overview of the fisheries in Sundarbans mangrove forest and socio economic features of the resource users of the forest. Subsequently, we present the empirical data to describe different shock exposure and coping strategies and factors that foster or inhibit coping mechanisms. We conclude with a discussion of ways to enhance fishers' coping ability and the policy implications of our research.

Concepts of risk and shock

Risk is generally understood as the "presence of a potentially large number of different possible circumstances that may materialize at a particular moment in time in the future" (Dercon 2010: 15). Following Tingley *et al.* (2010: 1249), we consider risk as "multidimensional and subjective concept", where a particular risk event means differently to different people (The Royal Society 1992, as cited in Tingley *et al.* 2010). While our study focuses on risk exposure, we note that not all events result in risks, and that shocks can stem from both risk and non-risk events. Non-risk events, like slight price fluctuation of food grains, can also create a shock, such as to poor households who are net buyers of food. Uninsured risks and unmitigated 'shocking' experience can lead to adverse welfare outcomes and can cause poverty (Dercon *et al.* 2005).

Risk can be covariate or idiosyncratic. Covariate risk is an aggregated risk that affects all members in a particular community or area, such as flood. Idiosyncratic risk, on the other hand, only affects any individual in the community such as health shock (Dercon 2002;

Takasaki *et al.* 2004). Chambers (2006: 33) exemplifies this using the vulnerability framework, which has two sides: “an external side of risks, shocks, and stress to which an individual or household is subject; and an internal side which is defencelessness, meaning a lack of means to cope without damaging loss.” This framework helps to understand the relationships between risk management and vulnerability to poverty of rural households in developing countries (Tai *et al.* 2010; Webb and Harinarayan 1999). We note that vulnerability is not synonymous with risk. While risk is about exposure to external hazard over which people have no or limited control, vulnerability conceptually includes also the capacity to manage such risks without suffering damaging or socially unacceptable loss of well-being (Dercon 2006; Chambers 2006; Hoozeveen *et al.* 2004; UNDP 2007).

Households generally try to negotiate with risk through a range of strategies, which may be *ex ante* (i.e. before shocks occur) or *ex post* (i.e. after shocks occur) (Dercon 2010, 2002; Morduch 1995, 1999). These responses have further implications. For instance, among the *ex-post* coping strategies, selling of assets, can deplete scarce resources of the households, thus can reduce their earning potential and push their productivity into downward spiral. This situation is particularly evident when shocks are recurrent and are continued for longer period that provide little prospect to the households to rebuild their assets (Mendoza 2009).

Risk can be insured. Once risk is insured, it ceases to be a concern as the subsequent shock will not affect welfare outcomes. Both market-based insurance and self-insurance system can avert negative welfare consequences in the event of risks exposure (Hoozeveen *et al.* 2004). Uninsured risks lead to poverty in two ways (Dercon 2010). First, as previously stated, risks, and shocks, are costly to individuals and households as they directly result in income loss. Second, household’s response to risk for some additional protection against shocks may come at the cost of income gains (Dercon 2002). For instance, for the fear of total investment loss, poor households may choose to invest in lower risk and lower return choices, and forego risky but higher return production choices (Dercon 2005; Chaudhuri *et al.* 2002; Morduch 1999). Finally shocks may directly lead to loss of assets (such as death of livestock) that contribute further poverty (Dercon 2010).

Exposure to risk and resulting shock can further widen inequality in the society (Rosenzweig and Binswanger 1993; Dercon 2002). As Mosley and Verschoor (2005: 60) put in “if the poor do not invest and the rich do, gains in enterprise income will be restricted to the rich, with the implication of growing inequality over time.” Women and children, particularly girls, are particularly susceptible to shocks. Women usually act as ‘shock absorbers’ for the household by reducing their food consumption to leave more for other members, notably their children and earning members (Mendoza 2009; Quisumbing *et al.* 2008). They also supplement household income through multiple jobs portfolios; reduce family expenses by limiting spending, and collecting foods and fuel from nature to meet the basic needs of their households (Mendoza 2009; Hossain 2009; WFP 2009, as cited in Mendoza 2009). Shocks could cause severe harm to children since families may cut spending and reduce investments on nutrition and education. Poor nutrition in early childhood could lead to long term harm in the form stunting and lower cognitive capacity and other persistent health impacts. The adverse health impacts and without education can cause intergenerational transmission of poverty (Mendoza 2009; Dercon 2006).

Study areas and methods

The Sundarbans is the largest single tract mangrove forest in the world which was declared a reserve forest under the forest act of 1855. The Forest Department (FD) of the Ministry of Environment and Forest of Bangladesh Government controls fishing activities by issuing fishing permits to fishers (Hoq 2007). Fishing activities in the Sundarbans are predominantly undertaken by small-scale fisheries, which are labour intensive, low in capital investment, and are pursued for subsistence and commercial purposes or both (Hoq 2007; Rouf and Jensen 2001). Fishing gears and crafts are mostly traditional. Gears include different types of gillnets (such as drift, large mesh, fixed, and bottom set), estuarine set bag nets, trammel nets, beach seines, push nets, drag nets, and many different types of hand-operated gears and traps (Rouf and Jensen 2001; Hoq 2007). Shrimp and prawn postlarvae collection for stocking in local coastal aquaculture ponds can be considered as the largest fishing activity in terms of number of people involved. About 70-75 percent of the households living along the rivers and creeks of the Sundarbans are engaged in this activity. Mixed species of white fish, mud crab (*Scylla serrata*), Hilsha (*Tenualosa ilisha*), and *Golda* (*Macrobrachium rosenbergii*) are the most economically important species (Rouf and Jensen 2001). Thus the Sundarbans provide a major source of livelihoods for about 200,000 fishers (Hoq 2007).

The livelihoods of resource harvesters of the Sundarbans are characterized by high levels of income poverty and human development poverty. Most of them have limited access to basic social services such as safe drinking water and healthcare. They also lack knowledge of health and sanitation practices. Most of them suffer long term debt bondage and face exploitative relations with moneylenders. They generally lack organizational skills, are void of professional memberships, and have a muted voice in decision making. Infrastructure is poorly developed and access to markets is restricted. Women are particularly underprivileged and marginalized, with minimum access to income, livelihood opportunities, education, and healthcare. Moreover, there is no mobilization and organization of the Sundarbans resource extractors in order for them to be recognized as stakeholders in the management planning of the Sundarbans (Mitra 2000; ADB 1998). Large income inequality between better off and poor households is another feature. Incomes of the richest households are six times higher than those of the poorest groups. Agricultural land ownership is extremely skewed, with only 51 percent of the population owning land. The average household size in the impact zone is 6.3 persons and the literacy rate is 36.5 percent (Mitra 2000).

The study was conducted in the three fishing communities (Figure 1) of Mothurapur, Chandipur and Dumuria villages in the edge of the Sundarbans mangrove forest under Shymnagar sub-district of Satkhira. The fishing village in Mothurapur is located in Munshigonj Union¹ on the coastal embankment bordering the river that separates coastal land from the Sundarbans forest. It consists of lower caste Hindus of 53 fishing households. Infrastructure in the Mothurapur village is poorly developed, with no electricity and inadequate sanitary system. Fishermen are mostly involved in beach and shore seine net fishing, whereas fisherwomen collect postlarvae of shrimp and prawn. Some women also do labour work, such as digging land for soil and using the soil for nearby road preparation and maintenance. The fishing hamlet Chandipur is situated in Buri Goalini Union. The community has 36 lower caste Hindu fishing households and is situated close to a paved road that leads to the district headquarters. Most fishermen are involved in beach seine and shore seine net fishing, but some fishermen also collect crabs. A number of fishers engage in marketing activities. Women are housewives but some do the same labour work as fisherwomen in Mothurapur. The fishing hamlet Dumuria is situated in Gabura Union, which was badly affected by cyclone Aila in May 2009. The first phase of the study was conducted soon after

the cyclone and all households were largely dependent on food and water rations as food sources, health and sanitation facilities were almost totally destroyed. We interviewed 20 Muslim fishing households in Dumuria. Fishers in this area collect shrimp and prawn postlarvae, and are also involved in crab collection.

Data were collected through individual and key informant interviews, as well as participatory observation from November 2009 to April 2010, with a follow-up field visit in August, 2011. Interviews were done using a semi-structured questionnaire, consisting of questions regarding household characteristics, possessions and productive assets, target species and gear used, risk perception, risks and shocks faced during fishing and in daily life, and coping strategies.

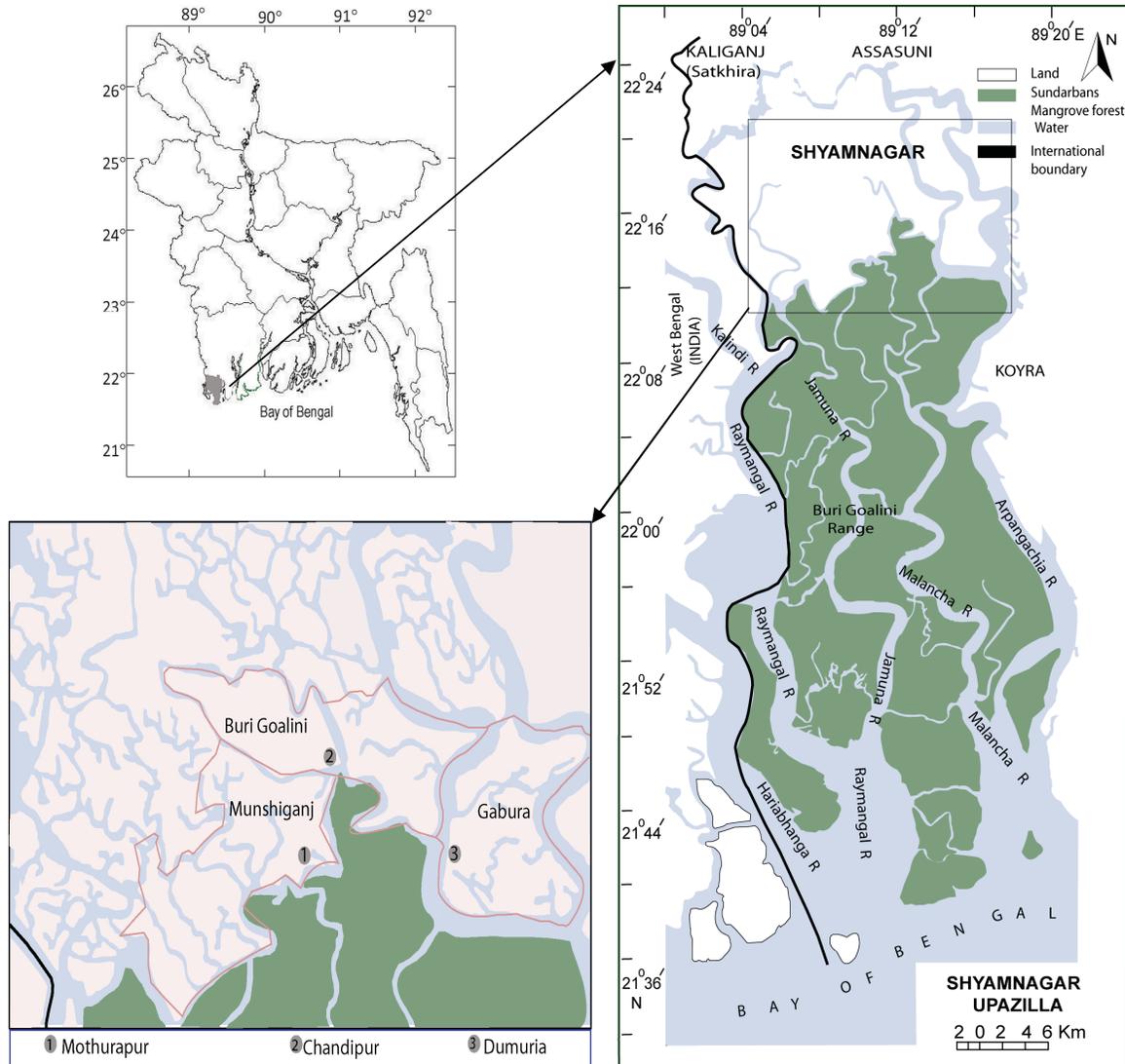


Figure 1. Map of the three study areas in the Sundarbans in Bangladesh.

In total, ninety five interviews were conducted, eighty of which were with fishers (both men and women). The rest were with people involved in post-harvest activities and credit markets, some forest officials and non-governmental organization (NGO) officials. Each individual interview lasted about 45 minutes on average. As fishers felt uncomfortable with tape recording, the responses were hand-written by a research assistant. In Mothurapur, the

majority of the interviewees were women, while in Chandipur, both men and women were interviewed. In the case of Dumuria, the interviewees were all male from 30 households who had taken temporary shelter on coastal embankments after their village was devastated by the cyclone. Additionally, twenty key-informant and in-depth interviews were conducted with some knowledgeable and interested persons who wanted to give more information. Supplementary to the interviews, we reviewed secondary data sources, mainly daily newspapers and reports published by NGOs. This secondary data was particularly helpful in providing information about the rehabilitation activities after the cyclone Aila, and about illegal and unlawful activities that take place in the Sundarbans. Hand-written data were transcribed with the help of a research assistant. After transcription, content was analyzed and classified into different themes for theoretically-guided analysis.

Results

Shock-ridden fishing communities in the Sundarbans

“We have crocodiles in the water, tigers on the land and dacoits on the boat but nobody is there to heed our grief.”

A fisherman from Chandipur

This section utilizes the empirical data to describe the livelihoods of the fishers of the Sundarbans with an emphasis on the events that create shock exposure and on the factors that mediate shock impacts which are presented in the Table 1. We also provide examples to illustrate the consequences of risks and shocks on the fishing livelihoods of the Sundarbans. Fishing activities in the Sundarbans are characterized by a peak week (*goon*) of good harvest, followed by a lean week (*bhati*) of poor harvest, caused respectively by spring tide and neap tide cycle. Fishers normally do not go out to the forest during lean weeks, thus fishing is limited to two weeks in a month. Most fishers go out once a day for only three to four hours because of tidal variation. Shrimp and prawn postlarvae collectors, on the other hand, fish twice a day. Extending the fishing period is not possible as high tidal water may damage the fishing gear and wash away the harvest. In addition, fishers are susceptible to natural fluctuations in catch. One fisher from Mothurapur described the situation:

Fishing is like a lottery- catch varies from day to day, one week to another. Maybe in one day you get bumper catch, but on subsequent days you may suffer poor or even no catch.

Unexpectedly poor catches or harvest failure in a single peak fishing week is a blow to the income of the fishing households. The shock becomes severe when poor harvests are recurrent for more than one peak period, or when fishers are forced to discontinue fishing due to the number of other reasons such as bad weather caused by low depression or tidal surges in the monsoon season.

Income from fishing may be further dissipated by illicit acts, such as ransom by dacoits and bribery by forest officials. Dacoits rob collected fish and crab, nets and even boats, and often kidnap fishers or physically attack them. At least 20,000 BDT (about 245 US\$) is claimed as ransom for each kidnapped fisher. Some fishers are killed by dacoits each year; numerous ones are wounded, and their families become bankrupt as a consequence. A number of ex-fishers said they left fishing because of dacoits and are now doing van² pulling. With respect to bribery, fishers have to pay a certain fee for getting permits to fish in the forest. This management rule allegedly involves corruption, as fishers claim that they need to

pay ten to fifteen times the amount of the actual fees for the permit. They may also need to bribe forest officials at different checkpoints when staying in the forest longer than the permitted period. Khuda (2008: 6) estimates that forest officials in the Sundarbans extort around 2.3 million BDT (about 28,400 US\$) per year from fishers. This different form of rent dissipation is explained by a fisher in Mothurapur as follows:

Income from fishing in the Sundarbans goes to seven³ families. You have to give bribe to forest officials to secure a permit for fishing, extortion or ransom money goes to dacoits, weightier (a person who weighs catch at landing sites) and commission agents will exploit extra money in the fish landing centre, then *mohajan* (money lenders) may come to the scene to claim money.

Table 1. Events that create shocks, factors that mediate shock exposure and strategies to address shock impacts (Based on interviews with fishers and participant observation in the Sundarbans).

Events that create shock exposure	Factors that mediate impacts of shock	Strategies to address shock impacts
<u>Risk events</u> <ul style="list-style-type: none"> •Cyclone and other extreme climatic events •Physical accident during fishing practice •Tiger attack •Attack by criminal gangs •Illegal rent seeking (ransom, bribe) •Food insecurity and drinking water crises •Illness and health problems •Legal procedure after breach of regulations •Social exclusion due to tiger widowhood 	<ul style="list-style-type: none"> •Ownership of land and other productive assets such as fishing gear and craft •Gender differences in family headship •Demographic characteristics of family and dependency ratio •Diversification of target species, fishing gears and fishing methods •Access to information network and alliance with powerful •Risk perception •Type of risk 	<ul style="list-style-type: none"> •Adjusting labour supply and using child as labour •Transfer to non-fishing occupation •Diversification of fishing occupations •Change in target species and fishing gear •Illegal and or unsustainable extraction of fisheries and other wood and non-wood forest resources •Family cooperation and consumption adjustment •Taking loans from neighbour and network •Informal mutual supports and mutual insurance •Trust, reciprocity and kinship •Occasional migration •Ritual and belief
<u>Non-risk events</u> <ul style="list-style-type: none"> •Price fluctuation of fish and food •Seasonality and harvest failure of fish catch •Inaccessibility to credit •Changes in land usage pattern (e.g. aquaculture) •Costs due to marriage and dowry •Resettlement of housing 		

To recover these additional expenses, fishers usually resort to illegal fishing, as well as illegal logging, creating thus a vicious circle of overexploitation and corruption. When fines are given to fishers for illegal activities, they add another shock to households' income. The fishing permits may be revoked and fishers have to take frequent trips to the district headquarters to pursue legal procedures, all of which involve money and time, and increase exposure to bureaucratic harassment.

For most of the interviewed households, the collection of shrimp and prawn postlarvae is a very important income supplementing activity for the fishing families. The price of these products depends, however, on the cycle of shrimp aquaculture. During the off-peak season, demand for postlarvae is less, and price may drop by about half of that received during the peak season. Thus their modicum daily income maybe lowered from around 160 BDT to 80 BDT (2 US\$ to 1 US\$). Despite the regularity and predictability of these price fluctuations, they pose a shock to marginal fishers with very low income. Since most of them are net buyers of food and other daily necessities except fish, fluctuations in food prices also have profound negative impacts on family consumption, raising thus their food insecurity (cf. Mendoza 2009). The dilemma of price declines and food buying is complex. One may question why fishers need to buy food and not consume more of the fish that they catch. In this particular case, it is not only that shrimp and prawn postlarvae are non-consumable fish products, but it is also rice, not fish, that is their staple food. Price instability of necessary daily commodities is an added ingredient to their vulnerability. Fishing households in our study areas spend more than sixty percent of their daily income on food. This situation drastically reduces their capacity to invest or save for future needs. After exposure to different shocks, fishers are in dire need of money to keep their families afloat. The formal credit market is poorly supplied, and in most instances excludes small-scale fishers from benefiting due to absent or insufficient collateral in the form of assets. Taking loan from money lenders is also risky because failure to repay the loan may force sale of remaining productive assets, such as boats and nets. As our study reveals, several fishers absconded to avoid or delayed repayment of loans from NGO and money lenders.

Fishing activities in the Sundarbans take place mainly in narrow canals and tributaries where territorial use of space often creates conflicts and tension. This is particularly the case with estuarine set bag nets for shrimp and prawn postlarvae collection, where theft or destruction of gear by opposing takes place. Additionally, small-scale fishers compete for space with coastal aquaculture. Canals and water-logged agriculture fields in rainy seasons, earlier used by poor fishers for their livelihood activities, have been turned into shrimp ponds. Discharge of farm effluents containing hazardous substances together with overfishing by shrimp and prawn postlarvae collector drastically reduce the fisheries productivity in the remaining freshwater bodies (Islam and Wahab 2005). Many *khas*⁴ land around a coastal embankment has been used as settlements for poor people, now has become the private property of aquaculture entrepreneurs. The expansion of shrimp aquaculture has thus removed a buffer for the livelihoods of many marginal fishers. One fisherwoman from Mothurapur recalled:

Even from rat hole in paddy field, we could collect paddy sheaf that ensured food security for at least two months. We worked in the paddy field during harvest seasons and payment of the labour was in grains rather than in cash and that was positive for our food security. Even we could use collected paddy sheaf for fuel, roof making of house or food for cattle. Now we have to travel long distance to further inland to find a paddy field to work on, because nearby all farm land is converted into aquaculture ponds.

Another issue related to shrimp farming is environmental quality. In Dumuria, a number of fishers mentioned that before shrimp aquaculture was initiated, they could drink groundwater and cultivate vegetables and fruits in their home yards. Now, one fisher from Dumuria said:

Only in rainy season, we could drink rain harvested fresh water, the rest of the year we have to drink water from pond after purification, because ground water is too saline to drink.

Health problems often constitute a significant shock in fishing communities. Women and children who use drag nets to collect shrimp and prawn postlarvae, need to spend five to six hours per day in the water. These uncomfortable working conditions affect their health. Skin diseases and gynecological problems for women and young girls are reported for these collectors. Many fishermen are distressed by infestations of mosquitoes. One fisherman from Chandipur said that:

Mosquito bites in the forest are so harsh and acute that sometime I feel that begging on land is better than fishing in the forest.

Moreover, village settlements are highly congested and sanitation facilities are poorly developed. Many households still lack water sealed toilets, exposing them to risk of water borne disease. Illness of a family head and main income earner is one of the most cited causes of shock. Although almost all members in fishing households contribute to family income, illness of one earning member can put them in a situation where they are unable to meet the costs of treatment. Their welfare is highly affected because they usually have little or no savings to fall back on. Even for some better off households, they risk becoming bankrupt, as they have to sell assets to meet high treatment costs. Many fishing households are living in the condition that Krishna (2010:17) describes as “only one illness away from poverty”.

A number of shocks also emanate from extreme natural events. A number of fishers are killed each year in the adjacent seas of the mangrove forest due to these hostile weather conditions. In Dumuria, during cyclone Aila, coastal embankments protecting the island from tidal water were destroyed and washed away, along with vast swath of agricultural land, shrimp farms, and homes. Many better off households were able to leave the island, while the rest stayed in temporary tents on the remaining wrecked coastal embankments. After more than one year, they went back to their homes but torrential rain in 2011 again flooded their village. In our study areas, some households needed to shift their houses four times due to erosion. With a very limited asset base, a onetime shift of settlement is already beyond their coping capacity. The accompanying loss of livestock, paddy fields, and other food sources seriously worsens local food security. In this particular circumstance, a vicious circle occurs as the non-fishing families, or non-fishing members of fishing families are pushed into fishing due to limited income generation options elsewhere. Going to the forests for maintaining livelihoods is often considered “the last resort activity”, as a local proverb says:

Nirdhon? Jao bon- No assets? Then go to the forest.

One key informant noted that since cyclone Aila the number of men entering and working in the forests has constantly increased. The Government of Bangladesh, after cyclone Aila, put a ban on wood collection in the Sundarbans to enable mangrove regeneration. For this reason, many former wood collectors enter into fisheries, thereby increasing pressure on the fisheries resources.

The Royal Bengal tigers that roam the Sundarbans are an impending risk for resource harvesters. In the last thirty years, 14 people have been killed in Chandipur and 10 people in Mothurapur study areas. According to the Forest Department of the Government of Bangladesh, in 2009 tigers killed 120 men. However, some deaths go uncounted because the documentation applies only to victims who are officially registered forestry workers. Government normally provides a lump sum of 100,000 BDT (about 1240 US\$) per person to the victim families. However, getting this compensation often involves bribery and suffers delays. More than 1,000 women are recorded, who have lost their husbands in tiger attacks (Kazim 2011). Commonly referred to as “tiger widows” these women have become a symbol of misfortune in their communities and in their in-law’s houses. Sometime they are ill treated after the deaths of their husbands (LEDARS 2010). One tiger widow from Chandipur recalled her sad experiences:

After the death of my husband by a tiger attack, my miserable life started. I took shelter in my parent’s home with my two kids. Working in a shrimp farm, sorting shrimps, only gives me 40 BDT (about 50 US cents) per day. The number of meals per day reduced; quite often I skip my meals to give some food to my children.

The misfortune also haunts the children of tiger widows. They may face harsh words from their classmates, for instance, that their fathers were killed because they were “bad” men. Because of this, many children leave school and try to eke out a living by engaging in labour work that earns them small income. Without education and other support, male children eventually turn to the forests, like their deceased fathers, putting themselves thus at the same risk (Kazim 2011; LEDARS 2010). Further, human activities also play role in intensifying certain risk activities in the forest. For instance; one key informant (an NGO official who is working with tiger widows) noted that:

Human activities largely influence the behavior of tigers. People are fishing and poaching in no-take-areas in the Sundarbans, thus the habitats and food sources of tigers are largely ransacked. Now tigers are roaming larger areas in the forest in search of food and attacking forest-goers. Day by day incidents of tiger attack and trespassing into nearby villages are increasing. Yet, the tiger is an integral part of resources management of the Sundarbans. If there were no tigers, the Sundarbans would perish within twenty years due to over-exploitation and illegal exploitation.

Impacts of risk exposure are also increased due to the socio-cultural setting of the communities. Though both poor and better off fishers are affected by dacoits, the poor suffer more and experience more profound shocks. Shocks are particularly biased towards women in the households or women-headed households in the fishing communities. Women and girls are usually involved in fishing practice that are time consuming, such as using drag net for collecting shrimp and prawn postlarvae, for erratic and meager returns. Women are usually assigned to less strenuous parts of manual jobs and get seventy percent of the wage of their male counterpart, despite their ability to do more. Limited scope for income generation as well as wage differentiation put women-headed households at the lowest income level in the communities. Girls become a liability in the family due to dowry practice, which was a common shock for almost all households interviewed, even though it is not totally unexpected when baby girls are born. Wedding-related expense may also push households into bankruptcy. In their study in rural Bangladesh, Baulch and Davis (2008) find that dowry represents the largest sum of expenditure (35%) in households, and wedding expenses are higher in a bride’s family (23%) than in a groom’s (21%). Thus the number of girls in a family makes the family more vulnerable. Due to dowry and other reasons like childhood

marriage, the rates of divorce and wife abandonment are increasing in fishing communities, some fishers indicated.

In sum, for most fishing households, shocks are recurrent, cumulative, and transferable to subsequent generations. Fishing households may suffer several shocks within a short period rather than a single one. This exposure to consecutive shocks makes their livelihoods highly precarious: “a single blow can be endured by most people, but when several blows fall one after the other, then it becomes very hard for any individual to cope” (Krishna 2010: 18). Recurring shock makes them very vulnerable to further risks, which may push them into extreme poverty or diminish their opportunities to get out of poverty. Yet, impacts of shock exposure is not uniform for all fishers, response also varies accordingly. The next section focuses on different coping strategies of fishing households in response to different shock impacts.

Coping strategies of the fishing households

For the fishing households in the Sundarbans reduced consumption is the first strategy to deal with crises of no or insufficient income. Usually the head of family and income earner gets the first priority in terms of access to limited food, with women having the last priority. The proportion of cheaper vegetables increases with the reduction of rice in daily consumption during periods when price increase. Taking rice and other daily necessities on loan from next door neighbours is also a common strategy to smooth consumption. Multiple and diversified economic portfolios are another strategy of coping. For instance, women collect shrimp and prawn postlarvae as their main gainful activity, but also work in shrimp farms, weed grass from agriculture fields, collect paddy sheaf, mend and prepare nets, collect mangrove leaves for fuel, prepare traditional quilts, work as housemaids, and prepare and sell charcoal from mangrove wood. Another dominant strategy is to remove children from school; boys are put to work in fishing jobs, even though they receive lower wages than adults. Similarly, girls join in collecting shrimp and prawn postlarvae. The reasons for child labour are explained by one fisherwoman from Mothurapur:

There are always income opportunities in the forest, if they can catch a big crab and sell it at BDT 80 (1 US\$), then I can buy two kilograms of rice. Rather than starving with children, better to earn with them.

The multi-species fisheries of the Sundarbans also offer job flexibility in terms of target species. During our study period, we observed that most interviewed fishers converted from catching fish species to harvesting crab because fish catches had declined, while the price of crabs rose. Crab collection also requires less labour power (only two persons) and it faces less risk of tiger attack. This coping strategy of changing target species was at first not taken up widely by lower caste fishers who, with their strong hereditary profession, consider fishing to mean catching fish not crabs. Times are changing, however, and crab collection is nowadays seen as rewarding. Thus fishers adopt diversification as way to manage risks associated with their biological and economic environments (Minnegal and Dwyer 2008).

Trust, reciprocity and kinship together constitute another coping strategy that draws on family ties and social networks. To meet immediate crises such as dowry, fishers most commonly take loans from their relatives. When fishers go to the Sundarbans, they are usually accompanied by their next of kin (e.g. their son, brother or father), who will not leave them if there is any mishap. One fisher from Chandipur underscored the issue:

During fishing in the forest if a tiger attacks me, my brother will not leave me, and he will fight back to rescue me, and I will do the same in his case. If dacoits kidnap me and one of kin is with me that will give me a feeling that I am not abandoned in the risky forest.

We heard of a number of cases where fellow fishers fought in the forest with a tiger when it attacked one of their fishing mates. Belief and rituals is another strategy to cope with the impending risk of a tiger attack in the forest. Before going to forest, traditional Hindu fishers perform various rituals and worship the goddess *Bon Bibi* (Forest Lady) that is different from their mainstream beliefs. There are several statues of the forest goddess *Bon Bibi* are scattered throughout the forest for worship by forest-goers. They believe that *Bon Bibi* is always vigilant in the forest to protect them from all the evil forces and it is she who can offer protection from tigers. This ritual practice and associated beliefs, they feel, provide them with the mental strength to engage in risky fishing practices in the wilderness of the forest.

Coping with income loss by increasing pressure on the fisheries resources is a widespread practice for fishers. Shrimp and prawn postlarvae collection, which is widely practiced by fisherwomen, is considered environmentally destructive, due to loss of large number of juvenile fish and crustaceans as by-catch. Along with other resource users, some fishers are involved in illegal logging, poaching of wildlife as well as in banned and destructive fishing practices, such as use of poison and catching of undersized and berried species. For traditional fishers, outmigration was rarely mentioned as a coping strategy, because some fishers feared that it may lead to loss of entitlement to the *khas* land where they are living, even if they do not formally own it. Most fishers think that they have limited capacity to survive if they migrate to other areas. Citing the benefits of common pool resources, one fisherman from Mothurapur said:

“Here we can stay on *khas* land, if I have no food; my kid can collect at least some fish. If I go to any city, where I will stay, who will give me food, if I don’t have a job for one day?”

Finally, outside intervention sometime shapes the coping mechanisms of fishers. After cyclone Aila, there was an influx of governmental, donor and NGOs activities into the areas that brought changes in the livelihoods of fishing communities. Sanitation and drinking water facilities have been improved and rehabilitation activities (like building houses, maintenance of roads and ponds) created temporary job opportunities for many fishers. After encountering relief activities and participating in different awareness programs, most interviewed fishers are now interested in education and concerned to ensure a better future for their children. Some fishers in Chandipur and Dumuria take out micro-credit loans offered by different NGOs to meet immediate needs. Being largely illiterate, they only obtain short-term benefits from these loans, and often become heavily indebted in the long run when they are unable to repay them. Few fishers have saving or insurance schemes as a part of loan arrangements. Cases of fraudulent activities by insurance companies, however, make poor or landless fishers reluctant to be involved in any NGO lending scheme. Instead, they prefer to buy food and other necessities from grocery shops on loan, which they pay off during the peak fishing periods when income is better.

Although the majority of fishers are similarly exposed to shock, coping heterogeneity exists across poor and better off fishing households (Table 2). The better off fishers are able to elevate their incomes by switching target species by using of different fishing gears to ward

Table 2. Key characteristics of poor and better-off fishing households in the Sundarbans (Based on interviews with fishers and participant observation).

Poor households	Better-off households
<ul style="list-style-type: none"> •Fishers who work as labour or on profit share scheme without ownership of fishing gears and craft and land •Houses are small with thatched roof •Frequently take loan or <i>dadon</i> for buying food or other daily expense •Higher dependency ratio with small children especially with girls •Widow headed households without any other active income earner in the family •Fishers using inexpensive drag and pull net for collection of shrimp and prawn larvae without any other income source •Suffer food insecurity on daily or weekly basis, sometime starve for one to two meals •Youngsters do not go to school but are forced to work by the family out of necessity •Reciprocal relation mainly exists within own community and relatives not beyond 	<ul style="list-style-type: none"> •Fishers who have at least homestead land, or if living on <i>khas</i> land, have other entitlements to land •Houses have corrugated GI (Galvanised Iron) roof sheet •To some extent, have diversified livelihoods outside of fishing practice •Usually don't take loan or <i>dadon</i> for daily usual expense •Possess small capital to lend to others on interest •Have ownership of fishing gears and boat or involve in fish trade •Enjoy food security all year round •Children usually go to school, but if they work, it is for adding income to the family rather than dire need •Usually have reciprocal relation with people beyond their own communities and powerful locals

off seasonality and low catch. This adaptation strategy requires, however, financial capital to buy different gears and to cover other ancillary costs, as well as skills that most poor fishers cannot afford or do not possess. Through land ownership, better off fishers could collect a number of material benefits (e.g. loans from bank) and non-materials benefits (e.g. access to social networks). Hence, a local proverb says “*Kheter kuna, durer sona,*” which translates to “a small portion of land is more valuable than gold”. It is thus not surprising that the majority of the better off fishers were seen to convert their fishing income to buying or mortgaging land. One key informant from Chandipur explained:

Incomes from forest fishing are diverse and attractive but tend to disappear like a bubble due to the extravagant behavior of fishers. Those who are able to lock their fishing income into land are successful.

Type of gears and target species are significant in terms of degree of risk during fishing in the forest. Better off fishers usually use more efficient fishing gears and safer fishing methods than poor fishers. Further, in Bangladesh, the local power structure often controls the ways the resources and help from the government reach the poor (Lewis and Hossain 2008). Thus, connection to locally powerful elites provides a cushion for the better off during period of crisis. Those who are locally powerful can negotiate by bribing forest officials or giving protection money to dacoits in advance to continue fishing in the forest.

To sum up, fishing households employ a number of coping strategies that include reduction and adjustment of consumption, income diversification through releasing labour and changing gear, illegal fishing, and drawing from mutual insurance and social networks, to mention some. Yet, the capacity of a household to cope with the effects of shock exposure depends on the household's productive capacity (e.g. assets, endowments and labour), and family characteristics (dependency ratios), access to social networks, power, and other factors. Unfortunately, poor fishing households in the Sundarbans have less of these resources when means that negative shocks push them in poverty. This will be discussed further in the next section.

Discussion

Poor people globally are preoccupied with dealing with risks and uncertainties, and their failure to adequately deal with shocks often act as main cause of their poverty (World Bank 2001). For the poor with lower per capita income, unmitigated shocks can have devastating impacts on their livelihoods (Fafchamps and Lund 2003). This proposition is highly relevant to small-scale fishing households around the world, which are enmeshed with risk and (Béné and Friend 2009). The livelihoods of the small-scale fishers of the Sundarbans are similarly highly prone to shock, which emanates from both risky and non-risky events (Figure 2). This high risk exposure is a major cause of their poverty (cf. Dercon 2010) and in the Sundarbans it reduces the well-being of the fishers in several ways. For instance, seasonality directly results in low income through loss of fishing days. Another example is, in the absence of formal health insurance for poor rural fishers, the death of the main income earner, or chronic illness creates both physiological and economic shocks, which can lead even better off households to bankruptcy and perpetuation of poverty that confirm the findings of Hulme (2004). In face of income loss, the poor need surplus accumulation to compensate for possible losses, but making savings requires "room to maneuver" (Clay and Schaffer 1984; Jentoft and Midré 2011) that the poor fishers of the Sundarbans do not have. The high risk forest environment and certain changes in land usage patterns, such as the expansion of coastal aquaculture activities in their area, put limits on the fishing and living space of poor fishers. Their "room to maneuver" is also restricted due to certain social relationship such as caste structure, gender relations (cf. Borooah 2005; Cleaver 2005). Women are vulnerable to poverty not only because of their social position, but also because of their role as "shock absorbers" (Mendoza 2009). Particularly, certain shocks lead to the social exclusion of women, as in the case of "tiger widows", and consequently their risk of abject poverty.

Exposure to shocks and ensuing vulnerability and poverty warrant a response from outside. The poor often adopt *ex-post* risk-coping strategies, which only enable them to continue to survive (Figure 2). Yet, a number of coping strategies to reduce shock exposure deepen their precarious conditions. As found in this study, poor fishing households mostly choose to invest in low return peripheral fishing in the Sundarbans and forego higher return on similar investments in deep forest fishing, in order to avoid possible loss of investment and

further risk exposure due to the attack of criminal gangs or the tragic situation created by tiger attack. Taking children out of school, poor nutrition due to reduction in the number of meals and/or reduction of the quality of meal are some other erosive coping strategies, affecting the current and future capacity of poverty averting potential. Better off fishers, on the other hand, employ different set of strategies, many of them are *ex-ante*, which might not lead to complete eradication of the impacts of shock, but would largely offset them. They are also found to develop risk management strategies that are more resilient because wealthier fishers have more diversified and efficient fishing gears and are able to provide bribes and pay extortion where needed. Greater mobility and larger “room to maneuver” in the forest provides them with an income edge over the poor members of the communities, and thus further widens the existing income inequality within the communities.

Recognizing the different responses from better off and poor fishers, we argue for a two-pronged approach to interventions, as shown in Figure 2. A protection-oriented component is required to reduce vulnerability to risk exposure, while a promotional component increases income, productivity, or employment opportunities (Matin and Hulme 2003; Krishna 2010). The both policies prescribed above are, in some cases intertwined and reinforce each other. For instance, access to formal credit schemes will not only protect households from exploitation by money lenders, but will also promote the income generation through investments in productive assets.

Given that seasonality and shocks affect their income and limit their upward mobility (cf. Krishna 2010), fishers need to be protected from events that erode their income. Some key informants perceive that although complete elimination of the sources of risk may not be possible, some of the risk events are manipulated by human activities and these are negotiable. Ironically, most fishers said that criminal gangs of dacoits are more harmful than tigers. Most fishers complain they are tired of having to meet the extortion and ransom to get access to fishing. So it is imperative to provide them “protective security” (Sen 1999), through, among other things, better governance. The national law of Bangladesh formally favors landless people to get access to *khas* land, but acquisition is largely discriminatory and the processes bear potential for conflicts with local elites. Secure ownership of *khas* land in a suitable setting should be a priority for livelihood strengthening of poor fishing households. Considering the limiting feasibility of insurance schemes by private enterprises, public micro-insurance of all legal fishing practices can be an effective strategy. A small premium could be taken when fishing permits are issued. This will also encourage fishers to practice legal fishing, which will reduce illegal and over exploitation of resources as well as serve as a buffer against sudden shocks. Having buffers and protective security will reverse risk averse behaviour of poor fishers to a certain extent and that, in turn, will boost their capacity to take on more risky but higher-return fishing activities in the forest. However, such changes of attitude need to be promoted by endowing fishers with socio-economical capitals.

In terms of promotion, raising income is not all that is required for risk management and reduction of poverty for small-scale fishers, it is also urgent to enhance the set of livelihood choices for risk spreading. Considering the riskier role of women in fishing and their history of job multiplication, land based job opportunities for women need to be promoted. Shifting the occupation of fisherwomen from forest fishing (particularly environmentally destructive shrimp and prawn postlarvae collection activity) would help to take pressure off the forest and also to reduce high dependency of entire households on vulnerable fisheries resources and uncertain incomes (cf. Takasaki *et al.* 2004). More importantly, to prevent intergenerational transmission of poverty, more effective *ex-ante* and *ex-post* strategies are needed (Santos 2010). Our study identified some promising outside

interventions after cyclone Aila. Now (2011) in Chandipur, about eighty percent of children (+5 years of age) go to school whereas only 5 percent of adult fishers (+30 years) have five years of schooling. The government now gives monthly allowances to students in primary schools. Particularly, the present study observed that school feeding programs, that provide nutritious biscuits to students, have positive impacts on school attendance. Given limited means and resources, targeting support is the most efficient solution in our context (Dercon 2005). Following this policy, vulnerable fishing households need to be brought into the social safety net through, for example, enrolling them in the existing Vulnerable Group Feeding program which is targeted to vulnerable people in society.

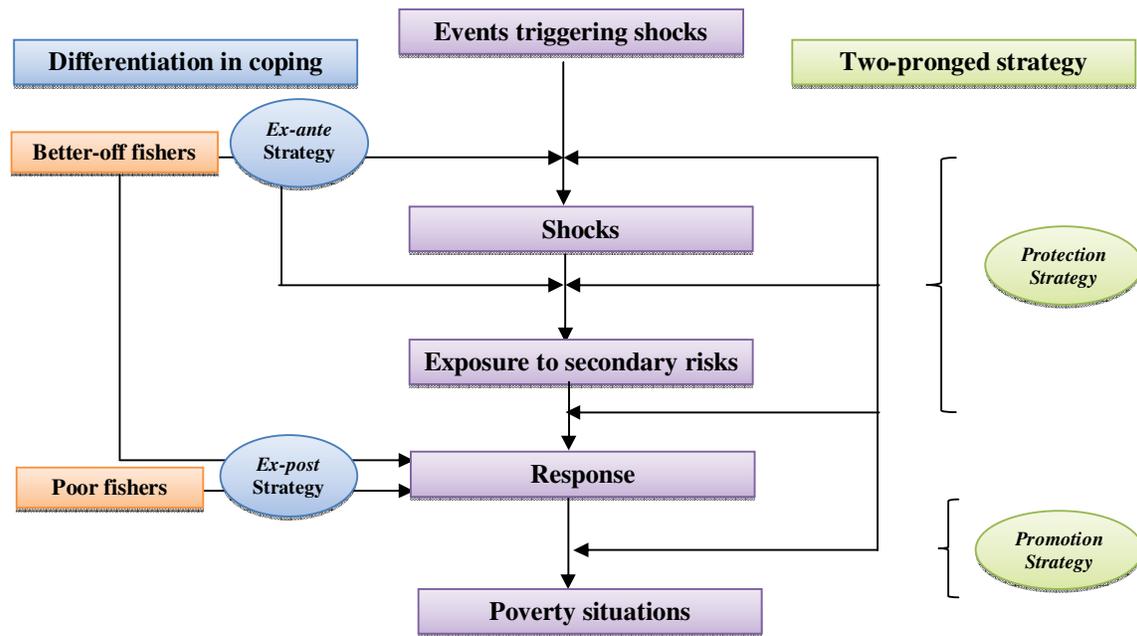


Figure 2: Impacts of risk and shock on poverty situation and coping and response strategies.

Most lower caste poor fishers suffer from a lack of interaction and diversity both in terms of their fishing group as well as in mixing with other communities. As a result they suffer social exclusion. This kind of segregation bars them from participation in the social and economic growth opportunities in the area (cf. Crona and Bodin 2006) and inhibits them from exploring new opportunities. Again, in the longer term, eradication of rural poverty is only possible by economic development (Fafchamps 1999). Hence, it is important to bring fishers into mainstream development processes. in the region This implies that it is crucial to provide fishers improving access to education, healthcare, and credit facilities, which will increase their opportunity to share in societal wealth creation (cf. Dercon 2010; Takasaki *et al.* 2004).

Conclusion

In this paper, we examine the risks and shocks faced by fishers in the Sundarbans, how they cope with risk exposure and shocks, what factors differentiate them in their adaptive capacity, and what implications differential capacity may have on their poverty situations. Our study shows that small-scale fishers in the Sundarbans face disruptive shocks that are numerous, severe, and widespread and that this shock exposure is a major driver that pushes or entraps them in poverty. In responding to shock exposure, fishing households in the Sundarbans have developed a number of strategies which are diverse and vary according to asset ownership. Yet, in absence of any effective buffer, frequent shocks create deprivation among poor fishers who are thus not able to employ sound coping strategies. On the other hand, of the adaptation strategies of better off fishers are more effective. This finding suggests that holding of socio-economic assets is a key tool to guard against shocks and differentiate the capacities of fishers to cope with or negotiate risk and shock impacts. Under such conditions, our study submits that reducing risk and shock exposure should be at the core of poverty reduction efforts in Sundarbans fishing communities. For instance, better off households in the Sundarbans may not be poor today, but recurrent exposure to shock can push them rapidly into poverty. Thus poverty alleviation strategies should aim at not only lifting the shock-ridden poor out of poverty, but also to protect risk-vulnerable (better off) fishers from getting into poverty. Hence, our study argues for a two-pronged strategy of protection and promotion to contain the risk factors in the household's environment, to mitigate the household's exposure to shock and to strengthen its capacity to cope with and manage risk exposure.

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Notes

¹Union Council is the lowest tier of three-tiered local administration in Bangladesh.

²This three wheeled human hauler (different than a rickshaw) is a widely used means of transportation in the study areas for passengers and goods.

³Seven is the symbolic number for many.

⁴*Khas* land is owned by the government

References

ADB

1998 Summary Initial Environmental Examination for Sundarbans Biodiversity Conservation Project in Bangladesh: Asian Development Bank. Available: <http://www.adb.org/documents/environment/ban/ban-sundarbans.pdf>. Access date: August 23, 2011.

Allison, E. H., A. L. Perry, M-C Badjeck, W. N. Adger, K. Brown, D. Conway, A. S. Halls, G. M. Pilling, J. D. Reynolds, N. L. Andrew, N. K. Dulvy

2009 Vulnerability of National Economies to the Impacts of Climate Change on Fisheries. *Fish and Fisheries* 10: 173–196.

Andrade, H., G. Midré

2011 The Merits of Consensus: Small-Scale Fisheries as A Livelihood Buffer in Livingston, Guatemala. In S. Jentoft and A. Eide (Eds.), *Poverty Mosaics: Realities and Prospects in Small-scale Fisheries*. Springer: 427-448.

Baulch, B., P. Davis

2008 Poverty Dynamics and Livelihood Trajectories in Rural Bangladesh. *International Journal of Multiple Research Approaches* 2(2): 176–190.

Béné, C., R. M. Friend

2009 Water, Poverty and Inland Fisheries: Lessons from Africa and Asia. *Water International* 34(1): 47-61.

Borooah, V. K.

2005 Caste, Inequality and Poverty in India. *Review of Development Economics* 9: 399–414.

Cashdan, E. A.

1985 Coping with Risk: Reciprocity among the Basarwa of Northern Botswana. *Man New Series* 20(3): 454-474.

Chambers, R.

2006 Editorial Introduction: Vulnerability, Coping, and Policy. *IDS Bulletin* 37(4): 33-40.

Chaudhuri, S., J. Jalan, A. Suryahadi

2002 Assessing Household Vulnerability to Poverty from Cross-Sectional Data: A Methodology and Estimates from Indonesia. Discussion Papers 0102-52: Columbia University.

Chuenpagdee, R., K. Juntarashote

2011 Learning from the Experts: Attaining Sufficiency in Small-Scale Fishing Communities in Thailand. In: S. Jentoft and A. Eide (Eds.), *Poverty Mosaics: Realities and Prospects in Small-scale Fisheries*. Springer: 309-331.

Clay, E. J., B. Schaffer

1984 Conclusion: Self Awareness in Policy Practice. In: E. J. Clay and B. Schaffer, (Eds.), *Room for Manoeuvre: An Exploration of Public Policy in Agricultural and Rural Development.*: Heinemann: 191-193.

- Cleaver, F.
2005 The Inequality of Social Capital and the Reproduction of Chronic Poverty. *World Development* 33 (6): 893-906.
- Crona, B., Ö. Bodin
2006 What You Know is Who You Know? Communication Patterns among Resource Users as a Prerequisite for Co-management. *Ecology and Society* 11(2): 1-7.
- Dercon, S., J. Hoddinott, T. Woldehanna
2005 Shocks and Consumption in 15 Ethiopian Villages, 1999-2004. *Journal of African Economies* 14(4): 559-585.
- Dercon, S.
2010 Risk, Vulnerability and Human Development: What We Know and What We Need to Know? In: R. Fuentes-Nieva and P. Seck (Eds.), *Risk, Shocks, and Human Development: On the Brink*. Palgrave Macmillan: 13-35.
- 2006 Vulnerability: A micro perspective. In F. Bourguignon, B. Pleskovic & J. van der Gaag (Eds.) Annual World Bank Conference on Development Economics-Europe: *Securing development in a unstable world*. The World Bank: 117-145.
- 2005 Risk, Poverty and Vulnerability in Africa. *Journal of African Economies* 14 (4): 483-488.
- 2002 Income Risk, Coping Strategies, and Safety nets. *World Bank Research Observer* 17 (2): 141-66.
- Edvardsson, I. R., D. Tingley, A. J. Conides, B. Drakeford , D. Holm
2011. Fishermen's Risk Perception in Four European Countries. *Maritime Studies* 10(1): 139-159.
- Fafchamps, M
1999 Rural Poverty, Risk, and Development. Center for the Study of African Economies, Oxford: University of Oxford.
- Fafchamps, M., S. Lund
2003 Risk-Sharing Networks in Rural Philippines. *Journal of Development Economics* 71 (2): 261-287.
- Harrower, S., J. Hoddinott
2005 Consumption Smoothing and Vulnerability in the Zone Lacustre, Mali. *Journal of African Economies* 14 (4): 489-519.
- Hoddinott, J., A. Quisumbing
2010 Methods for Microeconomic Risk and Vulnerability Assessment. In: R. Fuentes-Nieva and P. Seck (Eds.), *Risk, Shocks, and Human Development: On the Brink*. Palgrave Macmillan: 62-94.

- Hoogeveen, J., E. Tesliuc, R. Vakis, S. Dercon
 2004 A Guide to the Analysis of Risk, Vulnerability and Vulnerable Groups. Social Protection Unit, Human Development Network: The World Bank. Available: <http://siteresources.worldbank.org/INTSRM/Publications/20316319/RVA.pdf>. Access date: November 1, 2009.
- Hoq, M. E.
 2007 An Analysis of Fisheries Exploitation and Management Practices in Sundarbans Mangrove Ecosystem, Bangladesh. *Ocean & Coastal Management* 50: 411–427.
- Hossain, N.
 2009 Accounts of Crisis: Poor People’s Experiences of the Food, Fuel and Financial Crises in Five Countries. Report on a pilot study in Bangladesh, Indonesia, Jamaica, Kenya and Zambia. London: Institute of Development Studies.
- Hulme, D.
 2004 Thinking ‘Small’ and the Understanding of Poverty: Maymana and Mofizul’s story. *Journal of Human Development* 5(2): 161-176.
- Islam, M. S., M. A. Wahab
 2005 A Review on the Present Status and Management of Mangrove Wetland Habitat Resources in Bangladesh with Emphasis on Mangrove Fisheries and Aquaculture. *Hydrobiologia* 542(1): 165-190.
- Jentoft, S., G. Midré
 2011 The Meaning of Poverty: Conceptual Issues in Small-scale Fisheries Research. In S. Jentoft and A. Eide (Eds.), *Poverty Mosaics: Realities and Prospects in Small-scale Fisheries*. Springer: 43-68).
- Kazim, H.
 2011 The Outcasts: Bangladesh's Tiger Widows Fight Exclusion. Spiegel Online. Available: <http://www.spiegel.de/international/world/0,1518,744594,00.html>. Access date: October 2, 2011.
- Khuda, M. E.
 2008 Transparency and Accountability in Forest Conservation and Management: Problems and Way Out. Executive Summary. Dhaka: Transparency International Bangladesh.
- Kissling, E., E. H. Allison, J. A. Seeley, S. Russell, M. Bechmann, S. D. Musgrave, S. Heck
 2005 Fisherfolk are Among Those Most at Risk to HIV: A Cross-country Comparison of Estimated Prevalence and Numbers Infected among Groups at Risk. *AIDS* 19: 1939–1945.
- Krishna, A.
 2010 One Illness Away. Why People Become Poor and How They Escape Poverty. Oxford: Oxford University Press.

LEDARS

2010 Tiger Widows-A Hidden Issue in the Sundarbans. Tiger Widow Newsletter. Available http://www.ledars.org/livelihood_security_program.php. Access date: October 2, 2011.

Lewis, D., A. A. Hossain

2008 Tale of Three Villages: Power, Difference and Locality in Rural Bangladesh. *Journal of South Asian Development* 3(1): 33–51.

Lincoln, J. M., D. S. Hudson, G. A. Conway, R. Pescatore (Eds.)

2002 Proceedings of the International Fishing Industry Safety and Health Conference, Department of Health and Human Services: Woods Hole, Massachusetts,

Matin, I., D. Hulme

2003 Programs for the Poorest: Learning from the IGVGD Program in Bangladesh. *World Development* 31(3): 649–667.

Mendoza, R. U.

2009 Aggregate Shocks, Poor Households and Children: Transmission Channels and Policy Responses. *Global Social Policy* 9: 55–78.

Minnegal, M., P. D. Dwyer

2008 Managing Risk, Resisting Management: Stability and Diversity in A Southern Australian Fishing Fleet. *Human Organization* 67: 97–108.

Mitra, M.

2000 The Sundarbans: A Riparian Commons in Search of Management. Eighth Conference of the International Association for the Study of Common Property: Bloomington, IN

Morduch, J.

1999 Between the State and the Market: Can Informal Insurance Patch the Safety Net? *The World Bank Research Observer* 14(2): 187–207.

1995 Income and Consumption Smoothing. *Journal of Economic Perspectives* 9(3): 103–114.

Mosley, P., A. Verschoor

2005 Risk Attitudes and the 'Vicious Circle of Poverty'. *The European Journal of Development Research* 17(1): 59-88.

Quisumbing, A., R. Meinzen-Dick, L. Bassett

2008 Helping Women Respond to the Global Food Price Crisis. IFPRI Policy Brief 7. Washington DC: IFPRI,

Rosenzweig, M., H. Binswanger

1993 Wealth, Weather Risk and the Composition and Profitability of Agricultural Investments. *The Economic Journal* 103: 56-78.

- Rouf, M. A., K. R. Jensen
 2001 Coastal Fisheries Management and Community Livelihood: Possible Strategy for the Sundarbans, Bangladesh. ITCZM Monograph No. 04. Thailand.
- Salas, S., M. Bjørkan, F. Bobadilla, M. A. Cabrera
 2011 Addressing Vulnerability: Coping Strategies of Fishing Communities in Yucatan, Mexico. In: S. Jentoft and A. Eide (Eds.), *Poverty Mosaics: Realities and Prospects in Small-scale Fisheries*. Springer: 195-220.
- Santos, V. I.
 2010 The Effects of Earthquakes on Children and Human Development in Rural El Salvador. In: R. Fuentes-Nieva and P. Seck (Eds.), *Risk, Shocks, and Human Development: On the Brink*. Palgrave Macmillan: 1128-44.
- Sen, A.
 1999 Development as Freedom. Oxford: Oxford University Press.
- Sinha, S., M. Lipton, S. Yaqub
 2002 Poverty and "Damaging Fluctuations": How Do They Relate? *Journal of Asian and African Studies* 37(2): 186-243.
- Smith, M. E.
 1998 Fisheries Risk in Modern Context. *Maritime Anthropological Studies* 1: 29-48.
- Tai, X., S. Li, Feldman, M. W., Daily, G.C., J. Li
 2010 Rural Households' Risks Management Strategies and Vulnerability to Poverty in Western Rural China. ISDA: Montpellier Available: <http://www.isda2010.net/var/isda2010/storage/original/application/aeb7d95cb639bb08a017c5d311fc0085.pdf>. Access date: November 1, 2009.
- Takasaki, Y., B. L. Barham, O. T. Coomes
 2004 Risk Coping Strategies in Tropical Forests: Floods, Illnesses, and Resource Extraction. *Environment and Development Economics* 9: 203-224.
- The Royal Society
 1992 Risk: Analysis, Perception and Management. The Report of a Royal Society Study Group: London.
- Tingley, D. J. Asmunsson, E. Borodzicz, A. Aonides, B. Drakeford, I. R. Eovarosson, D. Holm, K. Kapiris, S. Kuikka, B. Mortensen
 2010 Risk Identification and Perception in the Fisheries Sector: Comparisons between the Faroes, Greece, Iceland, and UK. *Marine Policy* 34(6): 1249-126.
- UNDP
 2007 Fighting Climate Change: Human Solidarity in a Divided World, Human Development Report. Available: http://hdr.undp.org/en/media/HDR_20072008_EN_Complete.pdf. Access date: November 1, 2009.

Webb, P., A, Harinarayan

1999 A Measure of Uncertainty: The Nature of Vulnerability and its Relationship to Malnutrition. *Disasters* 23(4): 292-305.

WFP (World Food Programme)

2009 Pilot Monitoring of High Food Price Impact at Household Level in Selected Vulnerable Areas, Indonesia. (Mimeo).

World Bank

2001 World Development Report 2000/2001: Attacking Poverty. Oxford and New York: Oxford University Press.

Paper III

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Living on water: Towards sustainable livelihoods of nomad fishers in Bangladesh

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Abstract: This study explores the adversities and opportunities nomad fishers in Bangladesh face in their livelihoods, the strategies they take up to cope with crises and shocks, and the conditions needed to increase their capacities for overcoming poverty. Focusing on a nomad fishing community in Ramgati, Bangladesh, the study shows that nomad households are vulnerable to poverty due to geographic isolation, dependency on fragile fisheries ecosystem and limited assets base. However, a majority of them is not particularly income poor but is poor with regard to a wide range of other variables such as land ownership, and access to health and education facilities. The coping strategies they employ include a diversification of fishing gears and target species, the pooling of family labor, reciprocal relationships with local powerful fishing entrepreneurs and migration. The study calls for income diversification and household transferability to land as important options to reduce poverty and increase the capacities of nomad fishing communities in Bangladesh.

Keywords: Nomad fishers, small-scale fisheries, poverty, vulnerability, Bangladesh

1. Introduction

Bangladesh is endowed with over two hundreds rivers, forming a network of over 24,000 km of riverine waters before draining into the Bay of Bengal (Rashid 1989), which hosts rich fisheries and offers a livelihood option for millions of local rural people. The economic roles of small-scale fisheries in Bangladesh are manifold: small-scale fisheries provide employment for millions of rural people, supply a crucial and cheaper source of protein for the poor and generate cash from sales of fish (Islam et al. 2011; Islam 2011). Small-scale fishing is a deeply traditional and an inherent part of the culture and heritage in Bangladesh – as one old adage goes, *Mache Bhate*

Bangali- that means fish and rice makes a Bangladeshi. The income from fishing is instrumental for well-being, because in many cases, this is the only mean for fisher households to have access to other goods and services such as health and education (Rahman et al. 2002; Islam et al. 2011) Large heterogeneity exists in terms of fishing areas (river, floodplains, or coast), types of gears and crafts, or duration of occupation (either seasonal or full time activity). However, the vast majority of small-scale fishing communities of Bangladesh are confronted with more or less similar constraints that stand in the way of their sustainable livelihoods (Rahman et al. 2002).

Riverine and coastal fishers are both traditionally poor, grossly illiterate, generally with limited capitals, mostly functionally landless, and their livelihoods are crucially dependent on access to fisheries resources (Islam 2011; Rahman et al. 2002; World Bank 2002; Jentoft et al. 2010). Culturally, small-scale fishing is considered as a “lower-class” profession and small-scale fishers are geographically isolated, socially excluded, economically deprived and politically voiceless (Islam 2011; Rahman et al. 2002). Thus their precarious livelihoods not only relate to lower income, but to a wide range of other factors such as land ownership, debt, access to health, education, and political and geographical marginalization, to mention some but a few. These factors perpetuate and entrap them into poverty (cf. Jentoft & Midré 2011; Willmann 2004). To identify the effective way of interventions for improving the livelihood of fishing communities, Allison et al. (2011: 217) argue that

“(...) it is necessary first to understand how people make a living, what constrains or enables them to do so, what options are available to them and in what ways they are succeeding or failing. It is also necessary to understand the nature of poverty in its multiple dimensions and the complex reasons that some people remain poor, become poor or escape poverty.”

To realize a similar objective, we conducted an in-depth research in June 2011 to September 2011, in a nomad fishing community in Ramgati, Bangladesh. Among a number of reasons such as erosion of homestead land, or the need to explore new fishing opportunities, nomad fishers took up mobile life on boat. They use river and riverine fisheries as centrepiece of their livelihoods, thus providing an ideal case for deep ethnographic research of water-fisheries-poverty nexus. The present study explores the livelihood capitals of nomad fishers and identifies also the key issues supporting or hindering the sustainability of livelihoods and poverty situation of nomad fishers. In doing so, the study embraces the following questions i) what are the constraints and opportunities that are faced by nomad fishers in their livelihoods, ii) how do they cope with livelihood crises, iii) what are the conditions to create a virtuous circle of accumulation for the route out of poverty and deprived situations?

This paper is organized as follows. The next section describes the conceptual framework of the Sustainable Livelihood Approach (SLA). Section three describes the study area and methods. Next, it uses SLA to analyze the findings of the present study in section four. Finally, the paper sets out some concluding remarks for sustainable livelihoods of nomad fishers and for related policy implications.

2. Conceptual framework: Sustainable Livelihood Approach

The concept of livelihoods developed in the 1980s to emphasize people-oriented development (Scoones 2009). A livelihood encompasses people, their capabilities, their assets (both tangible e.g. resources and stores and intangible e.g. claims and access) and activities that are needed for a means of living, (Chambers & Conway 1992). A livelihood is sustainable when it is resilient against shocks and stresses and can maintain and enhance its capabilities and capitals, and in the same time sustain long term productivity of the natural resource base (Chambers & Conway 1992; DFID 1999). Later, the concept of sustainable livelihoods developed into the framework of Sustainable Livelihood Approach (SLA) (Gaillard et al. 2009). The SLA contains several components: i) Different risk factors that impacts the livelihoods in external environment are summarized as the ‘Vulnerability context’, here the term vulnerability is defined as ‘‘proneness to a sudden, catastrophic, fall in the level of a variable, usually access to enough food for survival’’ (Ellis 2003a: 2), ii) The structures associated with social relations, social and political organization, government systems, state and private service delivery agencies, resource access institutions, policy and the policy process are summarized as the ‘Transforming structures and processes’, iii) ‘Livelihood strategies’ are the collection and combination of different activities and choices that people adopt and carry out to achieve their livelihoods outcomes, iv) People’s livelihood strategies, lead to ‘Livelihood outcomes’ as higher or lower material well-being, reduced or increased vulnerability and poverty, v) The resources that are possessed or accessed by people are classified into five different ‘assets’ or ‘capitals’: human capital, financial capital, physical capital, natural capital and social capital. (DFID 1999; Ellis 2003b).

The Sustainable Livelihood Approach (SLA) is people-oriented and broad that provides an integrated view about people’s livelihoods within social, institutional, political, economic and environmental contexts (Bebbington 1999; Carney 1998 as cited in Ellis 2003b; DFID 1999). Ellis (2003b) identifies several reasons that give SLA particular strengths. For instance, this framework recognizes or discover (i) the multiple and diverse nature of livelihoods, (ii) institutionalized obstacles in improving livelihoods, (iii) the social and economic features of livelihood strategies,

(iv) the main factors that reduce or increase vulnerability, and (v) the micro-macro or macro-micro links that bridge livelihoods to policies. All these understandings in turn will help to identify the appropriate entry points for supporting the livelihoods of people (DFID 1999).

Consequently, the Sustainable Livelihoods Approach has become a very useful tool in development studies and now widely used in different settings like agriculture, health, urban planning. Comparatively, application of the SLA in fisheries has been limited (Allison & Ellis 2001; Allison & Horemans 2006). Nevertheless, application of the SLA in fisheries has certain importance as illustrated by Allison & Horemans (2006). They suggest that “SLA has emphasized the cross-sectoral diversity of household livelihood strategies among fisher folk, the pervasive influence of formal and informal institutions on livelihoods and resource management, the social and economic heterogeneity of households engaged in fishing and the multi-dimensional nature of poverty (p.764).”. In this study, we are particularly interested in exploring the capacities of the nomad fishing communities using the SLA. Following Davis et al. (2004: 3), we understand capacities here as the resources and capitals people owned to ‘resist, cope with and recover’ from shocks they experience. Capacities are often rooted in indigenous resources of the communities that depend on skills, knowledge and networks and opportunities. The efficiency of the coping strategies further depends on the utilization of these capacities (Gaillard 2010). However; capacities do not mean the opposite end of vulnerability, as highly vulnerable communities may display higher capacities (Davis et al. 2004).

3. Study area and methods

For the present study, data was collected from nomads’ settlement on boats in the fish landing site of Ramgati bazaar in Ramgati *upzilla* (sub-district) of Lakshmipur district (Fig.1). Ramgati is situated on the bank of the river Meghna. During peak season of commercially important Hilsha fishery, fishers from nearby districts of Bhola, Barisal and Chadpur, temporarily migrate here to explore better fishing opportunities. Nomad fishers are long term migrants who settled in the Ramgati coast and came mainly from Bhola and Barisal districts. There are about 270 nomad households in the study area. In terms of methodology, a combination of participatory and qualitative methods was used for primary data collection from June 2011 to September 2011. For some variables, quantitative data were collected.

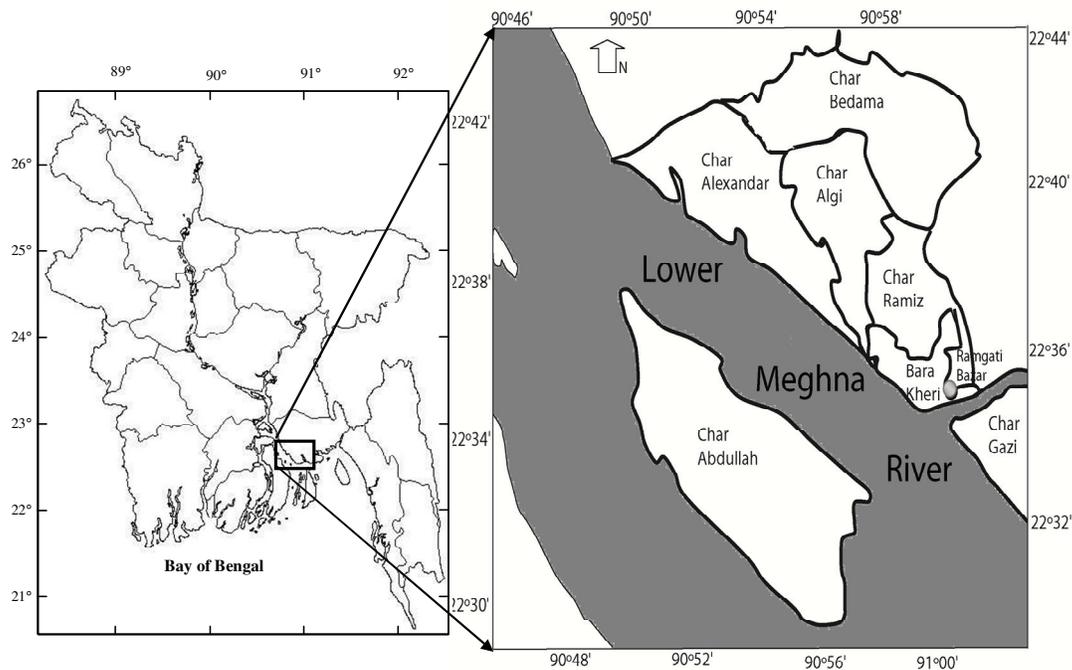


Figure 1: Map of Bangladesh showing the location of study area in Ramgati.

A total of seventy five individual interviews were conducted using a semi-structured questionnaire. Interviewees were selected through opportunity or convenience sampling. The interview guide consisted of questions regarding level of education, household's characteristics, possession of households and productive capitals, constraints in daily life and during fishing operations, monthly income and cost of fishing operations, and coping strategies during crisis as well as opinions for poverty alleviation. Interviews lasted about 45 minutes on average and interviewees included nomad fishermen and fisherwomen, fish trade commission agents and land-based fishing crews. Key-informant and in-depth interviews were also conducted with some knowledgeable and interested persons who wanted to give more information. Key informants interviews were conducted two to three times with the same person, and lasted for about 60 minutes per session. A total of ten key informants were interviewed. Several (8-10) key issues were covered by the in-depth interviews. In the case of contradictory information, cross-check interviews were carried out. The interviews were tap recorded and in some cases data were hand written down by a research assistant. To categorize the poorer and better-off nomads we employ the emic perspective of interviewed nomad fishers mainly based on productive capitals. Poor nomad fishers are defined as having only one boat, which is used for both fishing and living. They also possess only one or any set of fishing gears or don't have any

fishing gear at all, so work as labor in another's boat owner. In contrast, better-off nomad fishers have several types of fishing gears. They have separate fishing and living boats. Better-off households also have lower dependency ratio, and thus most of the family member are able to earn from fishing.

4. Livelihoods analysis of nomad fishers

4.1. Vulnerability context

Peoples' livelihoods options and the availability and endowments of capitals are essentially affected by three factors trends, shocks and seasonality over which they have limited or no control. These three factors together make up the vulnerability context that frames the external environment in which people exist and operate their livelihoods (DFID 1999).

Nomad fishers in Ramgati are exposed to different forms of vulnerabilities that stem from geographic settings and socio-economic conditions (Table 1). They live on boats that are usually smaller in size in comparison to any boat used by local fishing communities. A smaller size boat favors easy and swift movement in river but also increases the risks of capsizing during fishing in heavy swell of the river. Small children who don't know how to swim are particularly vulnerable; mere negligence in vigilance could result in fatal consequences if they drown. Sometimes a transportation vessel pass over these small boats which may result in casualties; one nomad interviewed in this study lost three of his children after such an accident. Housing on boat makes nomad fishers also more vulnerable to water borne natural disasters like tidal surges or cyclone that may cause sinking of the boat, accordingly result in total loss of the household's capital. Destruction of fishing gears is rather common because of entangling with other gears, river traffic, or the sweeping away by water currents.

Uncertainties from macroeconomic drivers (such as fuel price) contribute also to vulnerable conditions. A few respondents estimated that about one third of their average fishing income goes to meet fishing operational costs mainly for fuel. As a result, rocketing price of fuel is a common concern for nomad fishers. Fishing operational costs often exceed the income from fish catches. Thus, there is always risk of losing investment capital with insufficient fish catch. Such uncertainty puts nomad fishers in economic vulnerability. In the last decade, the fishing fleet of the nomad community experienced changes from oar-driven boats to engine-driven boats. Such technological changes benefit fishers (through easier and swift movement during

Table 1: Livelihood analysis of nomad fishers in Ramgati.

<p>Vulnerability context</p>	<ul style="list-style-type: none"> • Poor fish catch and downturn in income • Dependency on fishing as only livelihood option • Increasing number of fishers • Frequent loss of fishing gear • Climatic extreme events e.g. cyclone • Unsafe living on boat • Poor sanitation and health facilities • Saline water intrusion and crisis for safe drinking water • Inadequate access to institutional credit and governmental support
<p>Capitals</p>	<ul style="list-style-type: none"> • Human • Natural • Financial • Physical • Social
<p>Transforming structures and processes</p>	<ul style="list-style-type: none"> • Hilsha conservation laws • Law enforcing agencies • Local governance structure • Directorate of Fisheries • <i>Sarder</i> system • Relationship with fish trade commission agent • Relationship with crews • Gender role • Credit and insurance organizations
<p>Livelihood strategies</p>	<ul style="list-style-type: none"> • Multiple fishing gears and different target species • Maximization of family labour • Pull and release of land-based crews • Modification of fishing craft • Patron-client and reciprocal relationship • Dis-saving of assets • Illegal fishing • Mobility
<p>Livelihood outcomes</p>	<ul style="list-style-type: none"> • Year-round fishing income • Household transferability to land • Access to education and health facilities • Reduction of vulnerability and marginalization to certain extent

fishing) but also incurred in new cost like for engine maintenance besides fuel costs, adding further concerns. For instance, one nomad fisher said: *“If boat engine goes out of order, it creates many problems for me. I do need to hire one mechanic. Out of order engine not only incur costs for maintenance but also loss of fishing days. Thus income of my whole family (wife, husband and children) might totally lose.”* (Ramgati, September 20, 2011). Most respondents also share the concern regarding the soaring prices of daily necessities that made their livelihood even more difficult.

Increased fishing efforts in heavily exploited fisheries have major repercussions on fishers’ livelihoods. Almost all interviewed fishers perceived that the number of fishers both from nomad and local fishing communities are increasing every year. One nomad pointed out: *“Thirty years back when I went fishing with my father as toddler, we could see only one boat in a mile, now fishing boats are so dense like fingers on my hand.”* (Ramgati, September 15, 2011). Consequently, there is an intense competition for space in the river with regards to setting and operating fishing gears and in these situations; nomads are usually marginalized in getting suitable fishing space. One key informant nomad illustrated the case: *“Hilsha fishers use mobile fishing gear that need larger area for hauling, we only get scope in between the nets of other local fishers. We can have only scope for one harvest. On the other hand, land-based fishers, with larger boat and efficient gears roam in the rivers and they can do three harvests day and night.”* (Ramgati, September 22, 2011). The harvest is also limited by the fact that nomad fishers don’t go fishing at night due to security concerns with the family members on boat.

Climatic events and environmental change also lead to vulnerable situations in the nomad community. There is a general perception among the interviewed fishers that the stock of Hilsha species is moving away from rivers to offshore waters. Nomad fishers and their small boats are unable to sail in rough estuaries to chase Hilsha during the monsoon period. For similar reasons, during the monsoon, when rough weather is common in the river, they have to cease fishing. In the case of the lower Meghna river where the Ganges-Brahmaputra river system empties at the Bay of Bengal, this place is currently subject to massive geo-morphological changes. Consequently, the water course is constantly changing, leading simultaneously to riverbank erosion and sedimentation, together with river width widening and river depth reducing;. Such changes are definitely impacting fishing grounds. A key informant nomad fisher outlined the changes as: *“About thirty years back, we could see the moving school of fish as some fishes jumping out of water. We beat the water surface and gathered and pushed fish into net. There was about 200 feet deep water, now there are submerged sand bars and chars and no more fish there. Now we need to move a longer distance, thus need more fuels.”* (Ramgati, September 10, 2011).

Interviews with other nomad fishers revealed that the river morphology change is particularly difficult when water in the river starts to recede during winter. This fishing space reduces, and saline water from the estuary intrudes into their living place. Consequently, the availability of fish species and daily livelihoods is thus subjected to major problems.

Gender vulnerabilities are another concern. Most nomad women are burdened with a work load of about twelve hours a day. One nomad woman key informant explained the situations: *“The majority of nomad men only involves in fishing and selling fish to collect money and then roaming in local market. The rest of the responsibilities lie on women. They actively involved in fishing along with the man. Aside from this, they do household and family caring jobs like children rearing, shopping. In short, you can say that the woman maintain the whole family.”* (Ramgati, September 07, 2011). Some of their work is particularly strenuous. For example, during winter when saline water intrudes into the river, women have to cover a long distance on land for the collection of water for daily uses. Nomad women suffer “time poverty” and for major part of the day women have to involve in household chores but have little time for child caring (such as making food for children), or for taking rest in day hour. With all these predicaments, women’s positions within the nomad households and in the community are vulnerable. Abandonment of a wife and demands for dowries are alarming developments in the nomad community. In some cases, a husband will re-married without giving proper compensation to a divorced wife. Some nomad interviewees reported that a few decades back, no cases of dowries were found in the nomad community. Now almost all households have to pay dowries in the form of productive capitals like nets, boats or cash and ornaments.

Furthermore, nomad fishers are barely literate and the awareness about health and sanitation is very dismal. Due to the lack of knowledge about food nutrition, they do not take a balanced diet, even if it would be affordable with their income. Nomad fishers take food mostly from nearby restaurants in the local bazaar, where standards of hygiene and nutrition are less than optimal. Consequently, as the majority of women report, nomad children are mostly undernourished and suffer frequently from gastronomical diseases. All year around food insecurity is another threat. Nomads need to buy almost every daily necessity; they even buy fish on days they do not fish themselves. Thus, crisis prevails in the case of no fishing or no income for a few days. Nomad fishers also face problems when they recruit local crews to work for them. While fishing is tiring and risky, land-based crews are not interested in regular fishing; when fish catches decrease, they just switch from fishery to land-based jobs such as day labor, rickshaw pulling etc. Employer nomads, however, need to continue fishing to meet their daily needs. But due to this labor crisis they are forced to limit or

stop fishing frequently, which put a strain on their livelihoods. Since all their capitals are stored in their boats, they stay on these boats in all circumstances. Even during climatic disasters like a cyclone, they do not go to the nearby cyclone centre but move their boats to safer waterways within their reach. This is because they are afraid of losing their capitals once they leave their boats. However, such a strategy endangers their lives and their capitals holdings also become vulnerable.

In summary, nomad fishers experience vulnerability that originates from multiple factors. They are vulnerable due to the geographic setting of their living place and housing, due to their fishing occupation, gender relations and human development poverty. Yet, in this vulnerability context nomad fishers strive to create and maintain their capitals to achieve a livelihoods outcome. The next section analyzes different livelihoods capitals of nomad fishers.

4.2. Livelihoods capitals

In their livelihoods, people need a range of capitals that are combined and interact in different ways to generate livelihood outcomes (DFID 1999). Bebbington (1999) further extends the instrumental role of livelihood capitals. These capitals are “not only as things that allow survival, adaptation and poverty alleviation: they are also the basis of agents’ *power* to act and to reproduce, challenge or change the rules that govern the control, use and transformation of resources.” (ibid: 2022 [emphasis in original]).

4.2.1. Human capital

Most of the interviewed nomad fishers are found to have started fishing at around the age of eight to ten. Such an early fishing career severely undermines their literacy: that is manifested in the fact that almost none of the adult nomads are able to read and write; some can only sign their name without any knowledge of alphabets; the rest even never tried to learn how to sign. Only three percent of the interviewed young nomads (age + 25 years) have three to four years of schooling. Those children who live on boat do not go to school. Most of the children above twelve, irrespective of gender, work as full time fishers in family fishing enterprise. A precarious health situation is another worry for human capital accumulation. Children and women are reported to suffer different water borne diseases like diarrhea and usually lack access to government medical service. No training and extension activities for skill and knowledge development are reported to be taken by any of the interviewed nomads. Nevertheless, other local fishers acknowledged that most nomad fishers are better skilled in fishing techniques. One local land-based fishing crew said: “*In contrast to us, nomads hardly return empty hand from fishing trip. They will catch at least some*

fish. They live on water, so they know the water better than us. During Pangus fishing season, many local fishers follow nomad fishers to identify productive fishing ground for setting gears for bumper catch.” (Ramgati, September 19, 2011).

4.2.2. Natural capital

The findings from several interviews suggested that an increasing number of fishers from the local communities are getting involved in Hilsha fishing. This development coupled with an increased nomad population has led to accelerated exploitation of fish resources,

thereby affecting the income of nomad fishers. *“In the river there are so many boats and fishing gears; it seems that all are sieving water to take out fish”*, said one nomad (Ramgati, September 18, 2011). Environmental changes are another concern that negatively affects the availability fisheries resources. *“In many parts of the river, dubo char (submerged island) created due to accretion thus fishing ground shrinking, nursery and breeding ground is also destroying”*, said another key informant (Ramgati, September 18, 2011). Another fisher recounted: *“Let me explain the matter: Hilsha is fast moving fish, when it moves fast from sea to river, it may face submerged char, it feel that there might be more confronts in front, so they usually go back to sea areas or other place along the coast but not into that river.”* (Ramgati, September 19, 2011). Indiscriminate catch of juvenile (*Jatka*) and berried Hilsha species is another threat to the sustainability of their main natural capital.

4.2.3. Financial capital

Dadon (advance money) from fish trade commission agents (*Bapari*) is the only external sources of credit for most nomads, since they are almost excluded from access to the credits from any formal credit institution having no bankable capitals and permanent house in local community. They, however, accept that their fishing income is better than local fishers and the monthly income is estimated to vary from about 6000 BDT to 17000 BDT (about 75 US\$ to 210 US\$). A patron-client relationship with a fish trade commission agent provides nomads with capital for productive assets, however, some nomads complained about getting lower prices for their product. Traditionally, the right of the disposal of capitals is mostly at the hands of nomad fishermen. In contrast of nomad women, however, most nomad fishermen are in lack of a saving habit. One commission agent pointed out the situation: *“Nomads are notorious for their extravagant spending on consumption that eats out most of their daily income.”* (Ramgati, September 18, 2011). Gambling is another prevalent habit to waste fishing income. Accordingly, a major share of their expenditure goes for food (meals and snacks), different habits (e.g. cigarettes), as well

as maintaining fishing gears and boat. Investing on other physical and human capitals (such as education and durable housing) is very negligible. Nomads are generally reluctant about micro-credits, so no nomads are found taking micro-credits from any NGO. Nevertheless, there are a few better-off nomad fishers who are found to have some savings and life insurance schemes.

4.2.4. Physical capital

Following the interviews of fishers, income and poverty situations in nomad communities are found closely related to ownership of fishing boats and the number and type of fishing gears. To smooth year round fishing, most nomads are in constant struggle to maintain three to five types of fishing gears. *“Nomads pile up different nets like storing seeds of food grains by a farmer”*, said one key informant (Ramgati, August 23, 2011). However, the majority of nomad fishers are disadvantaged in terms of other physical capitals. Sanitation is poorly developed with no toilet facilities on any boat. They usually use murky river water for any kind of washing including bathing and cooking. For drinking, they purify river water using purification reagents. They have very limited access to public health facilities; usually go to unqualified village doctors or sales persons of the local pharmacy. Women usually give birth on boat. The roof of the boat shelter is made of straw, bamboo and some corrugated GI sheet. The living space inside of the boat is very congested. Fishery related infrastructure i.e. roads, markets, boat building materials are poorly supplied. The dirt road that leads to the market and landing site is muddy and major part is narrow paved paddy field boundary. Tidal water often disrupts road communication and they often need to cross tidal water to reach the local market. There is no provision of electricity in their settlement; only two households use solar panels to light their boat at night. Information about family planning, sanitation is insufficient as no health worker is reported to visit them. The majority of the nomad fishers have no entitlement to land. It is estimated that only about seven percent of nomads have homestead land in their place of origin.

4.2.5. Social capital

Spatial exclusion from land-based communities has fostered a strong social bonding within the community and they feel a sense of identity in the nomad forms of life. Though they are Bengali speaking communities but some nomads proudly declared that they have their own language which outsiders cannot even understand. Based on their place of origin and family relations, nomad fishers are found to live in two groups that together form the nomad community in Ramgati. Though in most cases they perform social activities together, inter-group tension some time goes high. Each

group, however, is very closely knitted and all relatives of family relations stay together on adjacent boats. Group based nomads are united: if someone faces any problem like conflicts during fishing; then other members will come to help. The majority of the interviewed nomads said that they inherited their fishing skills and other indigenous knowledge either from their parents or grandparents; a few nomad women attributed this contribution to their husbands. According to a few respondents, about a decade ago, nomads had very little connection with land-based local communities but now they mix with each other. Beside these, however, the nomad community is devoid of any outside assistance by any NGO or government agency for schooling or awareness raising programs. Only a few nomad fishers are reported to get government food relief during the ban season of fishing Hilsha. In terms of support from law enforcement agencies like Police and Coast guard, most interviewed nomads agreed that these agencies sympathize with their issues during fishing.

To summarize, the majority of nomad fishers are endowed with indigenous fishing skills. However, there are several undermining factors in their capital holdings such as wide spread illiteracy, child labor, etc. The very dependency on fisheries resources further threatens their livelihoods due to declining and uncertain catches coupled with environmental degradation. They are often underprivileged due to the lack of financial capital. Although on average, their income can be sufficient for meeting immediate necessities, but extravagant behavior of nomad men can bring miseries of economic crises. They fall short of different physical capitals like housing, sanitation, electricity facilities. In terms of social capital, traditional social fabrics are at risk of disentangling due to internal tensions. Thus, the traditional *Sardar* system is incapable of insulating them from outside interference in their own issues.

4.3. Livelihood strategies

As a fishing-dependant community, ensuring continuous fishing activity by using multiple fishing gears is the main livelihood strategy of nomad fishers. More than sixty percent of the nomad fishers have five types of fishing gears for five different species. Thus they are better-equipped to cope with seasonal variations of different fish species. These gears are different types of gill nets with different mesh size for catching adult Hilsha (*Tenualosa ilisha*), juvenile Hilsha, Crocker (*Otolithoides pama*), Pangus (*Pangus* species), and Cat fish (*Arious* species). Some of them also use hook and bait. Depending on availability of fish species, they alternatively use these gears to smooth out fishing income. When one fishing gear is lost their next strategy is to buy that gear from the income of other fishing gears. The poor nomad who cannot afford to buy different types of gears, they usually use single fishing gear that combines parts of net of different mesh size (i.e. five in one) to catch all varieties of fish mentioned above.

To maintain or buy fishing gear (or for other ancillary costs), almost all nomad fishers took *dadon* from *Bapari* – who are the local fishing entrepreneur and fish sale commission agent. In return nomad fishers provide their catch to the commission agent. The commission agent sells the fish in an open auction and takes ten percent of commission from the price but leaving *dadon* intact to be repaid by nomad fisher. The relationship between of nomad fishers and commission agents is the main driver that helps to modify the fishing gears of nomad communities in Ramgati. About twenty years ago, most of the commission agents in Ramgati were involved in shrimp and prawn larvae marketing for feeding aquaculture ponds. They avoided nomad fishers who were that time involved in bait and hook fishing. When shrimp and prawn larvae stock collapsed, commission agents were looking for other clients. They gave nomad fishers fishing gears and loan and asked them to leave bait and hook fishing and to catch Hilsha and other commercially important fish species. Soon nomad fishers became good at Hilsha fishing and expanded the range of their productive capitals and target species for year round fishing. In the same time, commission agents also became beneficiary by their trade.

Nomad fishers don't take labor from outside as long as their family members can fulfill labor demand. Such pooling and maximization of family labor results in child labor and overexploitation of women labor. Women and children often do extra labor repairing tattered fishing gears, cleaning and preparing fishing gear for next day fishing. Nevertheless, more than half of the interviewed fishers are found to hire fishing crews from local communities. However, fishing crews from local communities maintain some reservation against working with nomads due to their mode of living. Under these circumstances, nomad employers offer some benefits to the crews to make work more rewarding than working with land-based employers. First, majority of local employers are seasonal fishers but nomads are full time fishers, thus, by working with nomad crew, they can ensure continuous job and income for the longer term. Second, in terms of profit sharing, nomad fishers are more equitable. In the land-based asymmetric sharing system, there is one extra one share for skipper. But in the case of nomad, income is equally shared. Third, nomad employers usually provide some money or fish as *per diem* to crews to maintain daily expense in case of insufficient catch and no profit from fishing trips. One nomad employer explained the reasons: “*My crews are working with me, so I have to look after the well-being of their families. If I don't do so; they will lose trust in me as patron; and they might not come to work with me next day.*” (Ramgati, August 23, 2011).

Nomad fishers experience a slack fishing period in winter (December to February), when the fishable area in river gets constricted and saline water intrusion from estuary retreat freshwater. Such changes reduce fish availability, thereby rendering lower

income and surplus labor. To cope with such adversities nomad fishers usually release hired labor from their fishing team. Secondly, many nomad fishers change their engine driven boat to oar-driven boat to cut fuel costs. Thirdly, when conditions get worse due to repeated poor catch and insufficient income., family members getting unemployed, then they do a temporary migration. They move to upward along Meghna river to Matirhat to catch Crocker species and to avoid saline water. In fact, mobility is the most common strategy to adjust with seasonal and spatial variation of fish availability. In the peak fishing season, they frequently move downward of the Meghna river to Chairmanghat and South Hatiya for better fishing. The reason of frequent mobility is explained by one nomad fisherwomen as: *“Our mobility depends on availability on fish, if fish is available here for two years, we stay for here two years. If no fish is available here, we will not stay even one month here.”* (Ramgati, August 22, 2011). Nomad fishers also resort different strategies against different shock exposure such as illness or food insecurity. Commission agents usually provide loan only for fishing purpose; and for family crisis, and nomads are thrown back to their own lot. Nomads buy food and other necessities on loan from grocers or take their meal in the restaurant on loan.

In case of accumulated debt to different shops or other crises, they take informal loan from relatives and neighbors. After addressing all these options; mortgage valuable capitals such as ornaments is the next strategy. In the face of recurrent crisis and shocks they usually turn to dis-saving of valuables. Some fishers continue to cope with crises by selling the different fishing gears, then selling engine-driven fishing boat and converting to oar-driven boat. Ultimate sale of remaining capitals force the fishers to work as labor in other nomads’ boat.

To cope with insufficient catch and fluctuation of income, nomad fishers employ some other strategies which are harmful to the sustainability of natural capital. They use destructive fishing gear (monofilament gill net) and catch undersized Hilsha fish (*Jatka*) which is prohibited in stipulated management laws. This fine-meshed fishing gear is used as “safety valve” for maintaining ceiling of minimum income. When income from regular fishing gears goes low, they use monofilament gill net for meeting the costs of daily needs. Fishing prohibited species (juvenile or berried Hilsha) or during ban periods is rather common. *“We have no other occupations or even no savings for rainy days. So to meet daily costs, we need to continue fishing every day, even in ban season. Bapari, even not happy if we don’t do fishing because his income also depends on us”*, one nomad fisher stated why they do illegal fishing (Ramgati, September 17, 2011). However, in recent times some young nomads find an occasional income option by ferrying visitors to nearby *chars*. Several interviews also revealed that nomad fishers are in search of alternative livelihood options.

4.4. Transforming structures and processes

A number of policies, structure and institutions determine the capacity of nomad fishers to enhance their livelihoods. The fishing activities are subjected to few regulations. Each year from October 6 to 16, there is the ban period of Hilsha fishing, to facilitate safe spawning as well as proper breeding environment for the mother Hilsha. The regulation imposing a ban on netting Hilsha in certain rivers and along coastal areas, also prohibiting marketing, sales and transportation of the fish across the country. During the ban period, Directorate of Fisheries (DoF) conduct drives, seize fishing nets, realize fines and jail fishers by mobile courts and lodge criminal cases for violating the ban. Furthermore, from November 1 to May 31, the catch of *Jatka* (juvenile Hilsha below the length of 31 cm) is prohibited. During this ban period, in order to compensate the loss of fishing income, the government provides food relief for affected fishing households. However, the process of the selection of beneficiary and distribution food relief by local administration, involves widespread corruption and nepotism, and the majority of the nomads complain that they are deprived of this provision. Those who received relief complain that the amount is insufficient to smooth out family consumption during ban period.

Though the livelihoods of nomads are largely influenced by formal institutions and rules (as stated above), fishers have their own shadow administration system – the *Sarder* system. In the system, *Sarder* is the head of the community; he is supported by his councilors. *Sarder* is supposed to settle internal conflicts, negotiate and arrangement of marriage, taking decision about the mobility to new place. Though some ceremonial rules of the *Sarder* system are still valued, like taking permission from *Sarder* for any wedding, however, nowadays the role of *Sarder* is replacing by fish trade commission agents, *Bapari*. Such changes happen due to several reasons. First, nomad fishers can get “protective security” from the commission agent because latter is usually very close to the power of local administrative structure or member of any political party. Second, commission agents provide “investment capital” to buy productive capitals. Third, some commission agents act as counselor for nomads’ family well-being. For instance, some nomads buy insurances and/or deposit money in the bank after getting advice from their patron.

Gender roles are also identified to be crucial in the transformation process of nomad community. Unlike neighboring land-based local societies, nomad women actively engage in fishing, such as paddling boat to the fishing ground, hauling net in the river, or mending nets. However, fishing operations are considered as a male issue in local communities and nomad men are considered as disgraced if nomad women are involved in activities that are traditionally is assigned to men. Participating in tedious

fishing occupations, shouldering major job burdens and lacking of privacy for women in their living situations are some causes for land-based communities tending to despise, and avoid nomad fishers. Consequently, nomad fishermen envision transferring their family to land as well as withdrawing women members from fishing activities in the river, and putting them into post-harvesting activities and other land-based activities. As most respondents perceived, such transformation and livelihood outcomes will help them to be included into the local communities.

4.5. Livelihood outcomes

Livelihood outcomes aim at achieving livelihood sustainability that is measured by more income; increased well-being; reduced vulnerability; improved food security; and more sustainable use of the natural resource base (DFID 1999). Different types of fishing gear offers considerable flexibility in adapting to the uncertainties and downturn fluctuation of fish catch. In our study setting, the majority of nomad fishers who have different types of fishing gear and able-bodied family members- are not income poor in the scale of Bangladesh's national poverty line. However, livelihood outcomes are still precarious, with poor living standard for almost all nomad fishers with absence of basic amenities. Though most respondents agreed that the Hilsha fishery is much rewarding and the majority of commission agents (*Bapari*) are building their fortunes from the income of Hilsha trade. However, many nomads are unsuccessful to graduate from poverty even with good fishing income. The reasons for such conundrum are manifolds. Gill nets need extensive maintenance like mending almost every alternative day. Hence, a local proverb says: "*Jailler income jale jale-fishers' incomes are spent in maintenance of their gears*", highlighting the higher cost in maintenance and buying of fishing gear. Some knowledgeable fishers said that though irritant income and wide range of vulnerabilities make it tough to put aside money for savings, efficient planning and thriftiness could easily push the "daily want" away. Some nomads are unsuccessful, because they lack a habit of savings. Another group of unsuccessful nomads are burdened with a larger family size with higher dependency ratios, so they cannot afford those savings after meeting family expenses. Unsuccessful nomad fishers-although able to continue daily livelihoods without major crisis, thanks to earnings from Hilsha fishing during peak fishing season- ultimately enter into the slack fishing season without any savings and possibly with some potential debts. With insufficient fishing income, to maintain the family household in the lean fishing season, they become indebted. Once again they enter into peak fishing season with accumulated debt, i.e. what they need to repay from fishing income. Thus, unsuccessful nomad fishers are entrapped into a vicious circle of poverty.

With all these predicaments, the majority of respondents expressed satisfaction with their fishing profession. A few want to leave fishing, but most want to continue fishing and transfer their family to land. The study identified only three households that were able to buy land and transfer their family to land-based local communities in Ramgati. Such conversion has positive knock-on impacts such as schooling of children, improving housing and sanitation facilities. The study also observes that, to create a virtuous circle of capital accumulation, some nomads have to depend on the earnings of the next generation, i.e. on their children. The larger family size with higher dependency ratio may contribute to the inter-generational continuity of poverty. After, young children start earning usually parents start to put some money aside for savings that in turn, helps to accumulate capital. Three young members in the nomad community are found to have savings enough to buy a land for housing. Their success lies on their capacity to save, few years of schooling, and interaction with land-based local communities. The role of women in family economic decision-making is also important.

It was reported by several respondents that the women's role in income management has an important bearing in enhancing family well-being. *“Nomad women have better saving tendency than men. One reason is that men mostly spend their time outside of family environment; mainly in the local market. Women spend most time with other family members and they have to bear the hardship of family crises more so than men. Some women have therefore developed a general sense of the need to save money”*, said one key informant (Ramgati, September 22, 2011). Hence, when women are provided with some role in income management in the family, they are found to play an important role in initiating the virtuous circle of accumulation with small savings. Yet, ownership of capitals is mostly in the hands of nomad men, thus women are marginalized in those households, which undermines their authority in decision making of income management, which also negatively affects the poverty averting potential of many poor households.

With regard to local communities, nomad fishers create additional employment to local fishing crews as well as in fish processing, marketing and transportation. They also supply local markets with fishery products. In this context, fishing capacity of nomads played an instrumental role in reduction of their social exclusion. One key informant nomad recollected his memories to describe the changes as:

“Ten years back people from land avoided us, they even did not respond to our urge for help to unload fishing basket from our head in local market. Now people from land come to work with us, because they can earn better. *Bapari* (fish trade commission agent) also value us because their business depends on

our fishing. All these become possible due to fish. This fish is the bridge of our relationship with land-based community.” (Ramgati, September 23, 2011)

5. Conclusions

This study set out to study the livelihoods of a river based nomad fishing community in Bangladesh. Here we have explored the capitals nomad fishers have, examined the predicaments and prospects that nomad fishers face, their coping strategies and ultimately their livelihood outcome in respect of poverty situation. The study suggests that the majority of the nomad fishers, who have ownership of fishing gears and crafts, are not necessarily income poor. Nevertheless, almost all of them are deprived in terms of other capitals such as illiteracy, health, and social exclusion, to mention some (cf. Willmann 2004). This implies that better income from fishing does not translate into livelihood sustainability. The unsuccessful income poor nomad fishers usually lack productive fishing gears. They are burdened with larger family size or lacks capacity to manage their income. Consequently, they become indebted and entrapped into poverty for a major part of the year. Even more, living in an isolated geographic setting and on a boat is a constant reminder of their vulnerability and exclusion. Public and NGOs services and assistances are also missing in the community. Under such conditions of multiple deprivations, nomads are not devoid of own capacity such as fishing skills. They have managed their own niche in the local communities by offering job opportunities, thereby forming patron-client relationships. Yet, these strategies do not suffice to bring sustainability in their livelihoods; that warrant outside external intervention.

Outside intervention is needed in several veins. Sen (2000) posits landlessness as an instrumental deprivation. Most nomads view their livelihood sustainability as linked to transferring their households to land. This study identified that entitlement to land ensures sanitation and education service for nomad fishing households. Following the governmental regulation, newly emerged island *char* land could be a better place for allotting land to nomad fishing households. Our findings also confirm the urgency to address the frequent crisis for cash in nomad fishing community. The positive role of education as a ladder to upward mobility and graduating from poverty is universally documented. Poor nomad households cannot afford to forgo their children’s income; hence, schooling programs need to tailor to adjust with the working hour for maximum participation (like afternoon schooling hour) of nomad children. To prevent drop out, school going children need to be brought under the “Conditional Cash Transfer” of the Bangladesh Government for enhancing school attendance. In terms of addressing slack fishing season in the winter and in ban season, both protection and promotion measures are required. Nomad households need to bring under existing

food security program for vulnerable groups (Vulnerable Group Feeding Program) to tackle their “hunger period” during slack time. Again, dependency on the fishery as single livelihood option may cause livelihood failure in case stock collapse (Jentoft et al. 2010). Hence, measures should also be taken to reduce dependency on unstable fisheries as sole source of income by expanding opportunities for alternative occupation. Coastal tourism could be another avenue of alternative income for nomad fishers. The winter of slack income for nomad fishers is the peak season of tourism in Bangladesh. The scenic beauty of Meghna river and the coastal afforested *char* land in the river as well as life style of nomad communities certainly hold potential for tourism. Nomad fishers could use their boat for ferrying tourists. Furthermore, without surf and heavy swell in winter, cage culture is a growing aquaculture practice in different tributaries and canals of Meghna river. Thus cage aquaculture (for fish and crab) in the river may be viable options for nomad fishers. In this respect, different inputs for cage structures and financial, technical and training support are needed to supply to nomad fishers with extension services. Furthermore, winter season is also peak season for the fish drying business in coastal areas and dried fish caters both domestic and export markets. Nomad communities could be encouraged to involve in fish drying activities by connecting them to the credit market and dried fish trade. These alternative income generation options will act as a buffer in the slack season, will reduce pressure off vulnerable capture fisheries, and will contribute to the national economy, as well.

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References

- Allison, E. H., & Ellis, F. (2001). The livelihoods approach and management of small-scale fisheries. *Marine Policy*, 25(5), 377-388.
- Allison, E. H., & Horemans, B. (2006). Putting the principles of the Sustainable Livelihoods Approach into fisheries policy and practice. *Marine Policy*, 30(6), 757-766.
- Allison, E. H., Béné, C., & Andrew, N. L. (2011). Poverty reduction as a means to enhance resilience in small-scale fisheries. In R. S. Pomeroy & N. Andrew (Eds.), *Small-scale fisheries management: Frameworks and approaches for the developing world* (pp. 216-237). Cambridge, MA: CAB International.
- Bebbington, A. (1999). Capitals and capabilities: A framework for analyzing peasant viability, rural livelihoods and poverty. *World Development*, 27, 2021-44.
- Carney, D. (1998). Sustainable rural livelihoods: What contribution can we make? London: Department for International Development.
- Chambers, R., & Conway, G. (1992). Sustainable rural livelihoods: Practical concepts for the 21st century. IDS Discussion Paper 296. Brighton: Institute of Development Studies.
- Davis, I., Haghebeart, B., & Peppiatt, D. (2004). Social vulnerability and capacity analysis. Discussion paper and workshop report. Geneva: ProVention Consortium.
- DFID. (1999). Sustainable livelihoods guidance sheets. Numbers 1-8. London: Department for International Development.
- Ellis, F. (2003a). Human vulnerability and food insecurity: Policy implications. Theme Paper No. 3. Forum for Food Security in Southern Africa. London: Overseas Development Institute.
- Ellis, F. (2003b). A livelihoods approach to migration and poverty reduction. Norwich: Department for International Development (DFID).
- Gaillard, J.C. (2010). Vulnerability, capacity, and resilience: perspectives for climate and development policy. *Journal of International Development*, 22, 218-232.
- Gaillard, J.C., Maceda, E.A., Stasiak, E., Le Berre I., & Espaldon, M.V.O. (2009). Sustainable livelihoods and people's vulnerability in the face of coastal hazards. *Journal of Coastal Conservation*, 13, 119-129.
- Islam, M. M. (2011). Living on the margin: The poverty-vulnerability nexus in the small-scale fisheries of Bangladesh. In S. Jentoft & A. Eide (Eds.), *Poverty mosaics: Realities and prospects in small-scale fisheries* (pp. 71-95). Dordrecht: Springer Science+Business Media.

- Islam, G. M. N., Yew, T. S., Abdullah, N. M. R., & Viswanathan, K. K. (2011). Social capital, community based management, and fishers' livelihood in Bangladesh. *Ocean and Coastal Management*, 54(2), 173-180.
- Jentoft, S., Midré, G. (2011). The Meaning of poverty: Conceptual issues in small-scale fisheries research. In S. Jentoft & A. Eide (Eds.), *Poverty mosaics: Realities and prospects in small-scale fisheries* (pp. 43-68). Dordrecht: Springer Science+Business Media B.V.
- Jentoft, S., Onyango., P.O., Islam, M. M. (2010). Freedom and poverty in the fishery commons. *International Journal of the Commons*, 4, 345–366.
- Rahman, M. M., Haque, M. M., Akhteruzzamam, M., & Khan, S. (2002). Socioeconomic features of a traditional fishing community beside the old Brahmaputra river, Mymensingh, Bangladesh. *Asian Fisheries Science*, 15, 371-386.
- Rashid, H. (1989). *Geography of Bangladesh*. Dhaka: University Press Limited.
- Scoones, I. (2009). Livelihoods perspectives and rural development. *Journal of Peasant Studies*, 36, 171–196.
- Sen, A. (2000). Social exclusion: Concept, application and scrutiny. Social Development Paper No. 1. Manila: Asian Development Bank.
- Willmann, R. (2004). Poverty in coastal fishing communities. In E. Neiland & C. Béné (Eds.), *Poverty and small-scale fisheries in West Africa*. (pp. 245-252). Dordrecht: Food and Agriculture Organization of the United Nations and Kluwer Academic Publishers.
- World Bank. (2002). Bangladesh: Progress in poverty reduction. Background Paper. Paris: Bangladesh Development Forum.

Paper IV

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Migration and Translocal Livelihoods of Coastal Small-scale Fishers in Bangladesh

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ABSTRACT Based on qualitative fieldwork, this study analyses reasons and outcomes of fisher's migration in Bangladesh. The results show that fisher's livelihoods are characterized by a series of vulnerabilities and endemic poverty contributing to their migration decisions. However, fishers also migrate pro-actively to enhance their capacities and explore opportunities. The outcomes of migration are highly diverging: while for poorer fishers, migration is a way of coping with shocks, better resourced fishers can use it for asset accumulation. The importance of migration for their livelihoods and emerging networks across space generate forms of translocal households that coordinate their activities over long distances.

1. Introduction

Migration is an important strategy of poor households to secure, diversify and prosper their livelihoods (cf. de Haan, 1999; International Development Committee, 2004), which can also be observed in small-scale fishing communities (Marquette et al., 2002; Nunan, 2010; Overå, 2001). Though traditionally, migration decisions of fishers have mainly been conceptualized as responses to the movements of fish, the fluctuation of fish availability and market prices, however, over the past decades increasingly diverse patterns of migration and different reasons and motivations for migration have been explored. Though, the availability of fish still has an important role; but, migration is not always simply about following the moving fish stocks (Njock and Westlund, 2010). Rather, as for example Marquette et al. (2002) have shown in their rich study of the Moree people in Ghana, fisher's migration is a process which is "shaped by historical patterns, resource change, and economic and political factors, rather than simply a reaction to recent population pressure" (p. 325).

Though migration and mobility are integral part of the livelihoods of many coastal fishers in Bangladesh, few researchers have explored these issues. Focussing on concepts of vulnerability and poverty, as well as the concept of translocal livelihoods, the present study seeks to offer a deeper understanding of the role of migration in these livelihoods. . It thereby determines the factors that lead fishers to migrate, particularly the role of poverty and vulnerability in migration decisions; and the effects of migration on poverty and vulnerability reduction. Furthermore, it focuses on the emergence and relevance of translocal social networks in migration systems. This study has important policy implications because a better understanding of the role of migration in livelihood strategies can guide decision-makers to incorporate migration into poverty alleviation strategies (cf. Njock and Westlund, 2010).

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The paper is structured as follows: The next section builds on concepts on vulnerability, poverty, and translocal livelihoods as analytical framework for the empirical data. Section three describes the methods used to collect data along with a brief description of the study areas. Section four briefly characterizes the fisher's mobility. Section five looks at the reason to leave, or not, the place of origin for extended periods of time. Section six deals with the complex situations in the places of destination, outlining fisher's risks and opportunities, and the emergence and utilization of translocal networks. The main findings of the study are summarized and discussed in section seven, followed by some concluding remarks in the final section.

2. Poverty, vulnerability and translocal livelihoods

The definition of poverty, and therewith the question of who is to be counted as 'poor' and who not, has always been a crucial and heavily debated issue, with numerous, sometimes ambiguous answers (Atkinson, 1987; Notten and De Neubourg, 2011). The dominant focus on income criterion was shifted in the early 1980s, when Sen developed his capability approach, in which he extended poverty analysis by focusing on entitlements, opportunities and capabilities of people that determine their access to various forms of resources and their ability to integrate them into successful livelihoods. In doing so, Sen's approach added a clear process component to former static poverty concepts, as described poverty constituents are conceived as flexible and dynamic (Sen, 1981a; b; Sen, 1999). Building upon Sen's works, others have tried to expand the scope of poverty research by introducing new parameters like different forms of employment and their quality, measures of perceived autonomy and integration in decision-making, or questions of psychological and subjective well-being to poverty surveys (e.g. Alkire, 2007).

Today, the vast majority of the literature clearly goes beyond the simplistic, income-oriented conceptualizations of poverty, but conceives the issue as a multidimensional and complex matter. A number of authors have specified this multidimensionality for poverty analysis in small-scale fisheries. For example, Béné (2003) identifies four categories of intrasectional exclusion, namely economic exclusion, social marginalization, class exploitation and political disempowerment, that contribute to the impoverishment of fishers.

Similar to those newer poverty conceptions, vulnerability is a broad concept that focuses on possible negative impacts of external stresses on a system (individual, household, region and so forth). A widely used definition of vulnerability describes it as 'the state of susceptibility to harm from exposure to stresses associated with environmental and social change and from the absence of capacity to adapt' (Adger, 2006: 268). The determinants or causal structures of a person's or household's degree of vulnerability and relevant approaches have been broadly categorized into three main areas (Watts and Bohle, 1993): entitlement deprivation, political exclusion, and political economy approaches. In summary, vulnerability is understood as the result of cumulative and intersectional processes of exclusion, mediated through social and cultural systems over space that determine the susceptibility towards external stresses (Bailey, 2011; Findlay 2005).

The definitions above show that poverty and vulnerability are intimately linked. Both are conceived as processes with multiple determinants and similar root causes (esp. social and political inequity). Irrespective of the analogies, the concepts differ in certain aspects. Chambers (1989) distinguishes poverty from vulnerability describing the former as deprivation, lack or want; whereas, the latter is defined as defencelessness, insecurity, and exposure to shocks and stress. Vulnerability and poverty are often seen as mutually

reinforcing social conditions, as the most vulnerable parts of societies are often the poorest, and vice versa. Authors like McCulloch and Calandrino (2003), Carter and Barrett (2006) and Béné (2009) have refined this relationship by pointing out that households can be clearly above poverty levels and at the same time be highly vulnerable to shocks that can quickly push them back into poverty. This ‘welfare vulnerability’ (Béné, 2009: 923), that is the probability to fall back behind a certain ‘welfare threshold’ in future, is considered to be a central determinant for persistent poverty, calling for safety nets to protect vulnerable populations. Béné and Friend (2011) conclude for small-scale fisheries that a three-pronged framework, in which the connections between poverty, vulnerability and marginalization are considered, can help analyse mechanisms and processes that are responsible for fisher’s poverty.

Two complementary arguments can be made in an initial attempt to describe the links between vulnerability and poverty on the one hand, and human mobility or migration on the other. First, the decision to migrate can be understood as a coping mechanism to deal with poverty or external shocks. In this line of reasoning, migration has been described as a protective measure to avoid harms from potentially harmful external event, or, as a last resort to deal with externalities, after the failure of other coping mechanisms (cf. Warner et al., 2009). Similarly, migration has often been described as more or less desperate answer to escape chronic poverty although it’s often not the truly poor that migrate (cf. Ellis, 2003). Second, and more pro-actively, the decision to migrate is often considered a strategy pursued by migrants to preventively reduce both their vulnerability and poverty, which can be achieved in several ways¹: The diversified earnings or remittances from migration can play a pivotal role in improving social and economic conditions of households thus increase asset accumulation and also can prevent households downward spiral (Deb et al., 2002). Additionally, migration can help to extend social networks and increase the social capital of migrants, which can facilitate the proper use of resources needed for poverty reduction (Ellis, 2003; Jentoft and Midré, 2011). Ellis (2003) argues that seasonality and risk make poor people highly vulnerable- both of which can be ameliorated through migration, Migration then is conceived as pro-active strategy that reduces the probability of an adverse impact of external shocks.

The widespread relevance of temporal or permanent forms of migration for the livelihoods of disadvantaged groups of people in the developing world has recently been subsumed under the concept of ‘translocal livelihoods’ (cf. Greiner, 2011; Lohnert and Steinbrink, 2005; Long, 2008; Steinbrink, 2009). The term describes ‘sets of multidirectional and overlapping networks, constituted by migration, in which the exchange of resources, practices and ideas links’ (Greiner, 2010: 137) and puts ‘the translocal complex socio-spatial interweavings (...) at the centre of epistemological interest’ (Lohnert and Steinbrink, 2005: 95). A translocal household is then understood as a community, ‘whose members coordinate the organization of their activities of consumption, reproduction and resource use over an extended period of time’ (Steinbrink, 2009: 48).

In our study, we combine the different perspectives described above. We are looking at poverty levels and income opportunities of both, migrating and non-migrating households, as well as other constituents of poverty that, in a multifactorial understanding of the notion, determine the poverty of migrant’s households. We believe that the different poverty dimensions play a pivotal role in determining both, the disposition of households or single household members to migrate and the vulnerability towards external shocks. Consequently, we also look at the vulnerability contexts in which households act, both before and after a permanent or seasonal change of residence, as they shed light on the potential changes of their susceptibility through migration. In general, we understand migration decisions of households

not as the simple outcome of ‘push’ and ‘pull’-factors; we rather believe that it is important to consider the agency and self-determination of migrants and the emancipatory potential of migration decisions. The overarching aim of the study is to find out the relevance of permanent and seasonal migration for the livelihoods of small-scale fishers and its potentials for poverty and vulnerability reduction through a translocal lens.

3. Study areas and methods

3.1. Study areas

In the present study, data has been collected in migrant fishing camps adjacent to three local traditional fishing communities namely Kattali, Ananda Bazar and Katghar, along the Chittagong coast. Chittagong, the main port city of Bangladesh, is located in close proximity to these villages. Some permanent migrants live with their families in own or rented houses on government owned land (*khas* land). In addition, interviews have been conducted in a fishing community identified as one of the places of origin for respective migration movements. This sending community, which we will refer to as Mayapara, is situated in Subarnachar *upzilla* (sub-district) of Noakhali district (Figure 1) and consists of twenty seven fishing households. They use traditional fishing techniques such as set bag nets for collecting shrimp and other mixed species of white fish and mainly work as hired labourers.

3.2. Data collection methods

A combination of participatory and qualitative methods has been used for primary data collection from June 2011 to September 2011. A total of seventy individual interviews have been conducted (20 in Mayapara and 50 in Chittagong), using a semi-structured questionnaire consisting of questions regarding household’s characteristics, possession of households and productive assets, poverty status and vulnerability context, migration drivers, usage of remittances, as well as problems and prospects faced in the place of destination. Interviews lasted about 45 minutes on average and occupation of interviewees ranged from fishermen and fisherwomen, to boat and gear owner, to money lender. Key-informant and in-depth interviews have also been conducted with well-informed persons like veteran skippers or representatives of local Non-Governmental Organizations (NGOs). Key informant interviews have been conducted two to three times with each person, each time lasting about 60 minutes. A total of ten key informants have been interviewed on a number of core issues covered by the in-depth interviews. As fishers felt uncomfortable with tape recording, the interviews have been mainly written down by a research assistant. In case of contradictory information, further assessment was carried out.

4. Mobility of Hilsha fishers

The migration patterns analyzed in this study revolve around Hilsha fishery. The species Hilsha (*Tenualosa ilisha*) constitutes the largest single fishery in Bangladesh, contributing to about 16% of the country’s total fish production (Kabir, 2006). Coastal small-scale fishers highly depend on Hilsha fishery to compensate erratic income and catches during the rest of the year (Department of Fisheries 2005: 120). Thus, they are very mobile to chase the fast moving Hilsha fish and frequently change fishing grounds along the coast, depending on the availability of the species. As a result, many fishers migrate on a short term basis, mostly days or weeks. The trajectories of the seasonal migration are not linear and it is difficult to identify

general patterns. Some sending areas are simultaneously serving as destination areas, and vice versa. Nevertheless, in our study, we regard the Bhola and Noakhali districts as major sending areas, whereas the major destination area is Chittagong district. We will focus both on the seasonal, as well as the long term migration of fishers, that is typically a result of repeated seasonal migration episodes.

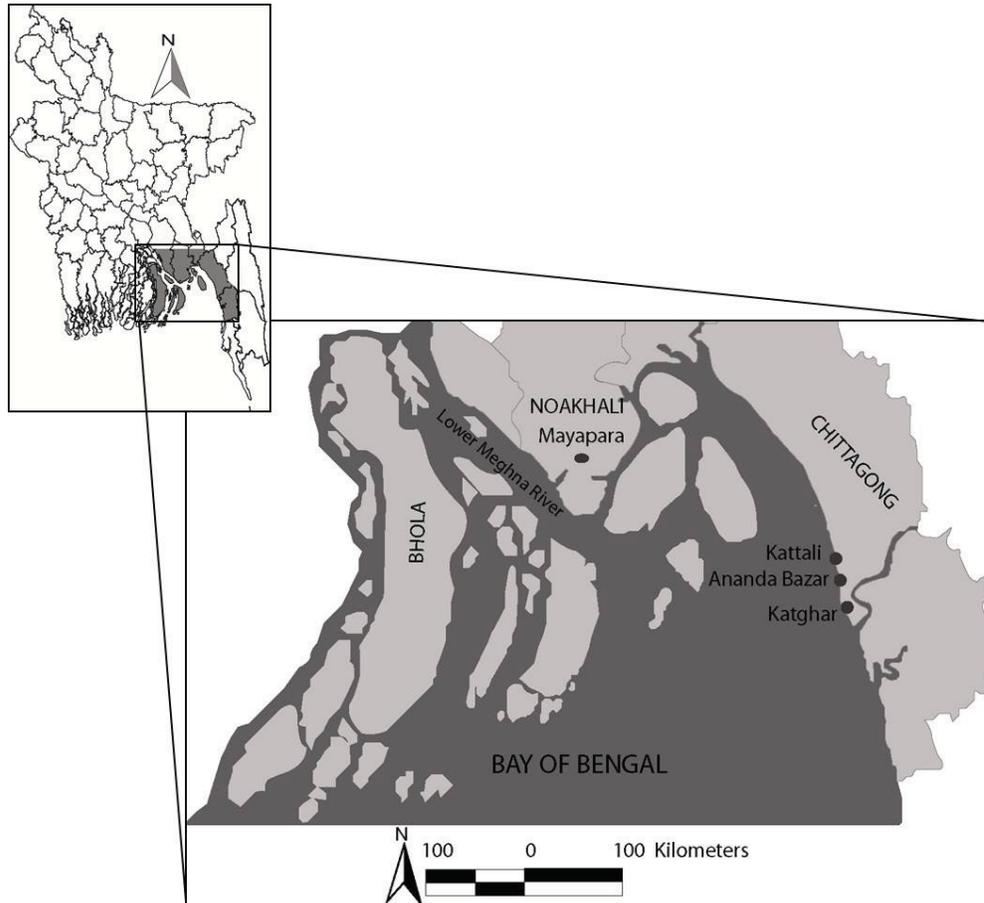


Figure 1. Map of the study areas.

5. Place of origin: Who migrates, who stays behind?

Most of the migrant fishers from the different communities in Bhola reported adverse living conditions in their home areas: they often live in congested settlements at the river side, mainly on government-held *khas* land and on coastal embankments. Being situated at the confluence of a highly dynamic estuary with massive geomorphologic changes, their livelihoods are subjected to continuous changes. The course of water is constantly changing, leading to riverbank erosion and subsequent accretion (cf. Lein, 2000). Some migrant fishers have already been displaced more than four times in their lives due to the ongoing erosion processes.

Fishing and agriculture are the two main occupations that absorb labour force in Bhola. Most fishers work as hired crew members and are paid 300 BDT on a daily basis, with regular interruptions of their engagement and income due to bad weather and fish availability.

Depending on their position within the crew, the yearly income from Hilsha fisheries ranges from 14,400 to 39,000 BDT (Department of Fisheries 2005: 118). With the loss of agriculture land as a result of ongoing erosion processes, more and more people enter fisheries, which lead to intensified competition over fishing grounds. In the context of increased fishing efforts and an overall reduced productivity (Amin et al. 2002; Nabi and Ullah 2012), the income level largely depends on efficient fishing gear and other ancillary costs that most poor fishers cannot afford². The access to formal credit schemes is almost impossible for marginal fishers without bankable assets. For those fishermen, migration, especially for the first time, is often a way of ‘exploring opportunities’.

The communities in Bhola are only poorly equipped with basic facilities like electricity, communication, education, sanitation, hospital, and recreation. The remoteness of the settlements also exposes fishers to risks associated with a deteriorated law and order situation. Attacks by criminals are a serious security issue for fishing people in Bhola. Generally, the fishing profession is still considered as ‘lower job’ given its lineage to lower-caste professions³. ‘*In Hilsha fishery there is money but little honour*’ laments one fisher from Vobanipur, Bhola (interview, 22 June 2011). A number of fishers said they feel embarrassed when being introduced to others as fisher and feel disadvantaged in the social life of the communities. Those rather subtle, continuously experienced mechanisms of social exclusion are bitter and painful experiences for the fishers, motivating them to pursue jobs outside the periphery of their own community.

For some interviewed migrant fishers, migration is seen as an adventure and a chance to increase their status in the hierarchy of their home communities. Especially some young migrants reported that moving out of their communities also means to break out of the pressure of family responsibilities or of tensions with other family members. As most fishers work in hired crews under strong supervision of the boat owner as skipper, a perceived lack of freedom and rigid working environments as described by one migrant fisher (interview in Ananda Bazar, 12 September 2011) could be another major reason for seeking outside employment under more favourable conditions. It has been reported that some boat owners lack respect towards their crews and show misbehaviour towards them. Migration, here again, bears emancipatory potential, both with regard to hierarchical and inflexible social structures, as well as economic disparities and dependencies.

Although the general socio-economic situation of the majority of fishing households along Bhola and Noakhali coast is characterized by a high degree of vulnerability and poverty, not all fishers migrate. Taking the fishing community of Mayapara in Noakhali as an illustrative case study, we will identify the reasons and motives for migration of some fishers, while, under similar conditions, others don’t migrate. When asked directly why they didn’t move somewhere else, people would often refer to advantages of their actual occupation. For example, four fishers involved in fish trade underline the advantages of their secure, year-round job with monthly income ranges from 6,000 to 7,000 BDT, which is more than the monthly wage of migrant crews in Chittagong. The job is perceived as rewarding, secure and continuous, still leaving much spare time with the family, as one ‘stayer’ said (interview in Mayapara, 12 July 2011). Three former fishing households that are now mainly involved in agriculture also do not intend to migrate. During the season of migration (June to October), some fishers without access to own fishing gears are involved in agricultural activities such as shared cropping and perceive their year round food security as more important than any remittance they would earn by migrating to Chittagong. Another group of ‘stayers’ are veteran fishers (*majhi*) who still work as skippers in fishing teams. Their status in the community is good and they feel respected by their fellow fishers (interviews with fishers

from Mayapara, 12 July 2011). In their case, migration would both diminish their status within the communities and the quality of their job. For them, self-respect and personal esteem is much more important than the surplus in money they could earn in the destination area. Another important reason not to move is the closeness to the family: a ‘stayer’ in Mayapara reported: ‘*Staying with my children and wife with little money is more important than a better income without living with my family*’, (interview with fisherman from Mayapara, 14 July 2011).

Nevertheless, out of 27 households in Mayapara, 21 have at least one member who migrates seasonally to Chittagong. Obviously, many migration decisions can be at least partly explained through adverse conditions in the small-scale fisheries sector in the community. For example, the high costs of productive assets for Hilsha fishing is a serious impediment to a self-reliant livelihood, even for better-off households. Another reason for concern is the continuous relocation of the community’s fishing grounds due to riverbed accretion and dam construction, now forcing fishers from Mayapara to travel about eight kilometres to reach the fishing harbours. Further, several interviews revealed that the majority of the fishing households in Mayapara encounters several financial shocks each year, among them dowry provisions and treatment costs during medical emergencies. We met one veteran fisher in Mayapara who had to finance 40,000 BDT cash dowry and gold ornaments worth 50,000 BDT for his elder daughter’s marriage. His migrant son contributed about half of the cash from savings. Those shocks are causing an almost constant state of indebtedness and financial insecurity. Some of the households have been forced to demand advance payments from entrepreneurs in Chittagong to overcome sudden crises⁴, showing the high connection between vulnerability and migration decision.

6. Place of destination: Exploring income, opportunities, and risk

Along the Chittagong coast, fishing is one of the most important economic activities and is traditionally dominated by low-caste fishers who fish year-round (Islam, 2011). An increasing reorientation of many young and educated community members to non-fishing sectors and the engagement of the *mohajon* (influential entrepreneurs with non-fishing backgrounds) in Hilsha fishing activities during the peak season led to a significant demand for migrant labourers.

6.1. Income, opportunities and assets accumulation

The Hilsha fishery sector of Chittagong hosts both long term and temporary migrants. Temporary migrants can broadly be categorized into two types: one group takes own crafts and gear and fishes independently. Most temporary migrant fishers belong to the second group that works as waged labourers, either for local fishers looking to enlarge their crews, or for local *mohajon*. They are paid a monthly wage that varies depending on the type of work they are doing and the experience of the *majhi* (skipper) and crew (usually between 5,000 to 6,000 BDT), and are additionally provided with food, lodging (in fishing camps) and *per diem* by the employer. Wages are usually cumulated and paid as a lump sum at the end of the season.

According to some migrant fishers, the main economic benefit of the migration episode lies with the lump sum payment at the end of the season. As living costs during the contractual period are covered by their employers, fishers that are not indebted or in need of money for

immediate consumption purposes of other household members are able to save a main share of their wage. Thereby, it is not only the marginally higher amount of money they are paid in Chittagong, but also the mode of the monetary flow that favours the translocal households. In comparison with monthly payments, the availability of a lump sum amount (which has been reported from 15,000-20,000 BDT for fishing crew members) makes it easier for households to start investments in different assets. For example, one migrant fisher reported that he has renovated his house with about 17,000 BDT from his last year's payment.

After the Hilsha fishing period ends, the majority of migrants return home for diverse reasons, for example to continue rewarding livelihood options back home or due to strong family ties. Those who want to stay long term, often after having performed two or three phases of circular migration, pass into different jobs like *rickshaw* pulling or ship-breaking labour. The readymade garments industry in Chittagong also opens opportunities, primarily for female family members of long-term migrants. Although many migrants live in slum dwellings in the first instance, almost all interviewees reported that their overall situation has improved for various reasons. With regard to personal security issues, life is generally perceived to be much more secure in the new area, as the threat to become victim of criminal attacks is felt to be reduced (interviews with group of fishermen in Kattali, 22 June 2011). The Chittagong coast is relatively well protected through concrete bolder systems and coastal embankments. For the disaster-prone migrant fishers, this setting of relative security and reliability of the environment is among the main reasons for their decision to stay in Chittagong (interviews with a group of fishermen in Katghar, 24 June 2011).

6.2. Risk, vulnerability, and negotiations to create niches

Though migrant fishers often enjoy more freedoms, their livelihood situation is still tense, as revealed by several interviews. First, the working conditions on the boats are more dangerous than before. Each year fishers are killed or injured in accidents, but no compensation is usually given. Second, the fishing camps often have a very limited access to basic facilities like sanitation and water. Third, despite its important role in the migration process, the relation to the *mohajon* can contain pitfalls: several cases were found where *mohajon*-migrant tensions result in under- or late payment of migrants. Fourth, migrant fishers are in most cases not included in the decision-making processes regarding the fishing practices of the local communities they are entering. Fifth, migrants lack proper social capital, which is especially critical in times of crises. The *mohajon* would assist migrants in matters related to fishing activities, but in personal matters, for example the illness of a family member, migrants are thrown back on their own limited resources.

In response to those circumstances, migrant fishers are in constant negotiations to create their niche. In most cases, migrant and local fishers employ different fishing techniques and gears. Local fishers traditionally use the fixed set bag nets in their ancestral fishing ground *Faar*⁵, whereas migrant fishers prefer mobile gears like gill nets, mainly in deeper waters beyond the fishing areas of the local fishers. This helps to avoid potential conflicts over the acquisition of *Faar*, which otherwise may escalate. The *mohajon* provide, according to statements of many of our interviewees, a form of 'protective security' that is strongly connected to the *dadon* system. Even if they are better off, independent migrant fishers take *dadon* from a fishing entrepreneur, as the affiliation with a local patron represents a form of protection against harassment by local fishers (interview with a group of fishermen in Katghar, 22 September 2011). For long-term migrants, the search for niches goes beyond the Hilsha season. Here, the level of education and skills plays a pivotal role in determining the

success of the 'migration experiment'. Migrant fishers with a basic education and with suitable contacts are able to work in garments factories in Chittagong, ensuring them a continuous income of around 4,000 to 5,000 BDT per month (interview with fisherwomen in Katghar, 22 September 2011) that compensates for the reduced opportunities in the fisheries sector during lean seasons. The options of illiterate migrants without respective social and human capital are reduced to less rewarding manual jobs. A permanent status is in some cases reached with the assistance of the *mohajon*, who employs reliable and hard-working migrants in other businesses during the off-season and thereby ensures their loyalty and availability for the next Hilsha season.

6.3 Translocal livelihoods: Opportunities and constraints

In many cases, the decision to migrate is shaped by and shaping rural-urban networks across space that organize the behaviour of households in the face of poverty and vulnerability. Virtually all migrants report that any saving from their income in Chittagong is intended to be invested in their homestead; whether the money is used for agriculture inputs or the education of children or siblings, for buying productive assets such as *rickshaw* or sewing machine or for improving the housing situation, is jointly decided. At the same time, the livelihood activities in the place of origin are maintained: household members who stay in the home community continue the local activities (for example fishing or agriculture) and sustain former livelihood strategies. This often means that women take over their husband's agricultural activities, thus reducing the opportunity cost of their mobility. Apart from the share of the income needed for covering the expenses at each location, the outcomes of all livelihood activities are conceived as common household property. Some migrant women working in garments are found send their toddler to grow up with their grandparents as there are insufficient child care facilities in absence of parents. Women's important role in livelihood activities and family care also strengthens the translocal mode of the migrant households at both ends, where migrant women are found to foster strong ties with households members back home through regular communication and by sending gifts and necessities.

Both long and short term migrant fishers have been found to maintain strong ties with their home and can still be considered part of the social and economic structures and strategies back home: they are still involved in important family decision-making, either via mobile phone or during regular visits in the home community. The majority of migrants said that they frequently visit their families for festive, e.g. religious events, or to settle family disputes or taking responsibilities in wedding arrangements of family members. The other way round, household members staying in the home communities regularly visit the migrants (for example to consult physicians), and at the same time provide the migrant with vegetables and food grains from their homestead. The division between the two household parts is often not static, but will change its composition depending on, for example, living costs in the two locations: the higher living costs (e.g. higher food prices) in the urban setting forces some long term migrants to temporarily send back their families until the situation improves. One fisher said: *'It is quite tough to survive in Chittagong if the spouse doesn't work. If both work, one income is used for meeting family costs and the other is saved. Three months ago, I brought my wife with me. But with a small baby she can't work now, so she returned home. Back home, she can still grow vegetables and collect fuel woods that we otherwise would need to buy here.'* (interview with a fisherman in Katghar, 21 September 2011).

One of the common desires for the majority of interviewed migrants is to save money and to ultimately return home. *'Though I am working here, I always have feelings for my home. I am now living a better life here and I am sure I will lead a better life back home too, if I could manage some savings and start a petty business in my village'*, as one fisher puts it (interview in Ananda Bazar. 12 August 2011). However, the translocal strategy of migration does not bring positive outcomes in all cases; instead, it may increase vulnerability and poverty (Kothari, 2003; Nunan, 2010). We found some 'failed' migrants, for example younger community members that developed drug addictions and stopped supporting their families. This is especially tragic, when migrants initially have to take loans from neighbours or relatives to cover the migration costs. The family back home has to compensate the missing remittance flow, again taking up a loan to maintain the livelihood. After the migrant's return, the household is heavily indebted and ultimately often forced to sell remaining assets. Of course, in those cases migration is perceived as a negative, risky undertaking: *'If my husband would have worked here, I could have had a better control of how he spends his income. I might not have been forced to take a loan for our living costs then'*, said one woman from Mayapara, Noakhali (interview on 23 July, 2011).

7. Discussion

We have shown that at their place of origin in the districts of Bhola and Noakhali, the livelihood of coastal fishers is beset with a series of vulnerabilities, with social, economical, political, and institutional facets. In addition, marginal fishers experience multifaceted poverty that is manifested in a lack of physical and subjective safety and security, limited employment opportunities, and an inability to lead a dignified public life (Table 1).

In comparison to the situation at the place of origin, earnings from Hilsha fishing are reported to be only marginally higher at Chittagong coast. Hence, income poverty can only explain parts of fisher's motivation to migrate, which can also be said for the vulnerability contexts: the vulnerabilities at the two locations differ in nature, but it can rather be described as an exchange of different facets of vulnerability than a total eradication. Thus, exploring opportunities and adding extra income to the translocal household could be argued as additional incentive for the decision to migrate (Greiner 2011). However, although the place of destination offers different opportunities for strengthening the income base and reducing the vulnerability of migrants, the access varies greatly and is especially dependent on personal skills, education, the duration of stay, and the access to networks. Therewith, migration helps to improve the socio-economic conditions of many migrants, but not of all.

The unsuccessful ones are often temporary migrants without proper human and social capital. The income gained during their migration episodes is mainly spent on food, to meet the costs of sudden expenditures like illness and to repay loans originally taken to cover the cost of their own travel. Thus, those migrants fail to initiate a virtuous circle of accumulation.

Table 1: Opportunities and constraints at the different locations of translocal livelihoods.

	Opportunities and constraints in the home communities	Opportunities and constraints in migrant destinations
Environmental setting	<ul style="list-style-type: none"> • Erosion of homestead land • Erosion of cultivable land • Decreasing fisheries productivity 	<ul style="list-style-type: none"> • Turbulent monsoon conditions • Decreasing fisheries productivity • More stable coastlines • Less exposure to hazards
Infrastructure/facilities	<ul style="list-style-type: none"> • Inadequate basic facilities, e.g. roads, health care, education, etc. • Congested settlements • Poor marketing and credit facilities 	<ul style="list-style-type: none"> • Better access to basic infrastructure and marketing • Poor housing in migrant camps • Protection measures along the coast
Occupation	<ul style="list-style-type: none"> • Dependency on fisheries sector and subsistence farming, little options to compensate seasonality • Lack of efficient fishing gears in poorer households • Independent occupation with continuous income for better-off fishers • Year-round food security from subsistence farming 	<ul style="list-style-type: none"> • Better earnings, opportunity to save money • Availability of efficient fishing gears • Availability of alternative job opportunities, also for women • Access to off-season occupation highly dependent on social and human capital • High food prices
Patron-client relationship	<ul style="list-style-type: none"> • Often exploitative patron-client relationship • Rigid working environments under patron supervision 	<ul style="list-style-type: none"> • High dependency on patrons for entry into fisheries • Crucial entry point into other occupations • Occasional maltreatment by patron
Security	<ul style="list-style-type: none"> • Insecurity during fishing campaigns (e.g. crime syndicates) 	<ul style="list-style-type: none"> • Safer fishing due to the absence of criminal gangs
Freedom and recognition	<ul style="list-style-type: none"> • ‘Lower-caste’-job with little social reputation from neighboring communities • Independent fishing and job satisfaction for better-off fishers • Respect and self-esteem for veteran fishers within communities 	<ul style="list-style-type: none"> • Freedom of movement • More recognition for fishers by <i>mohajon</i> • Extended social networks with other migrants • Exclusion from decision-making processes and social life of local fishing communities

In contrast, for the majority of long term and skilled migrants, the year-round and diversified income sources enable them to systematically accumulate a certain share of their earnings. This saving is then available for investment back home, for example in agricultural or fishery inputs. In some other cases, the money, in combination with other resources, is the basis for a household member’s labour migration to the Middle East: the successful internal migration in the first instance can have a catalytic role for a subsequent international migration. Drawing from the two separate outcomes, we can suggest that for some migrants, migration is one way

of 'coping' with risk, vulnerability and poverty thus a 'way of hanging on' (Rogaly and Rafique, 2003: 679), whereas for others, migration is a way of assets accumulation.

Irrespective of the outcomes, the overwhelming majority of migrants, both temporary and permanent, keeps up an 'active orientation towards home' (Lohnert and Steinbrink, 2005: 102) which is the toehold of their translocal strategy to address livelihood security. This connection exceeds the expected upholding of personal contacts, but comprises all fields of household organization, for example the decision over investments in housing or productive assets, the continuation or interruption of single livelihood strategies or other long-term household strategies. The exchange processes within the divided migrant households don't stop at financial resources, but also cover practices and ideas as 'social remittances' (Greiner, 2010: 136): We interpret this arrangement as mutual development strategies across space, confirming the existence of 'translocal livelihoods'. In line with Long's (2008) findings, members of the translocal households in both places are in close contact via mobile phone enabling them to engage with and share each other's ideas and plans for family well-being. Thus, although the physical location of the household's members is separated by hundred kilometers they can nevertheless shape each other's conceptions.

Confirming earlier findings on potential positive roles of migration (cf. de Haan 1999, Ellis 2003), this translocal strategy can be instrumental in reducing poverty and vulnerability both at the place of origin and destination. This is obvious when financial resources and ideas are passed from one end (location) of the translocal network to increase the earnings at the other, as for example when productive assets like sewing machines or rickshaws are bought, diversifying income sources and thereby spreading the risks of income failures. However, flows of resources are not only directed towards the place of origin but also take the other way round, albeit to a lesser extent. Rural household parts take over important functions in the translocal livelihoods: women often take responsibilities of migrant fishers when they are away, to cope with income fluctuation and job availability household member may back to home. At the same time, the success of mobility and translocal strategies depends very much upon whether and how female household members participate in the migration episode and therewith contribute to the income of the translocal household. A second earner helps to save up income, to compensate the higher living cost in the city and to overcome the regular shocks striking the household. Following Greiner (2011:614) translocality then 'provides a path to socio-economic upward mobility' In contrast, households those are devoid of networks and connections for a secondary job often spend their incomes immediately to satisfy basic needs. In the worst case, the outcomes of translocal strategies may reverse where 'failed' migrant entrap their families back home into debt. Here, 'translocal relations entail a socio-economic downward spiral' (Greiner, 2011: 614).

Migration provides a way to establish ties with people from different socio-cultural backgrounds, which often directly benefits the migrant's social environment and opens up employment opportunities for other family members. Those emerging social networks at the place of destination are crucial entry points in providing financial, social, and emotional support and assistance to the newcomers, thus minimizing uncertainty, the cost of relocation and enhance migrant's coping capacity (cf. Afsar, 2002). This also underlines Steinbrink's (2009: 137f.) findings that networks beyond the (intrinsic) internal network of a translocal household are crucial resources for accessing and utilizing the opportunities in the different localities of those households. For example, the connections to a *mohajon* can be of great importance for a permanent relocation, although the 'selectivity and exclusion' of this patron-client system favours only some migrants (Platteau, 1995: 776).

8. Conclusion

We have seen that a translocal view on the livelihoods of small-scale fishers in Bangladesh can help understand the complex rural-urban interweavings and connections that are central elements of respective livelihood strategies. We have seen that migration helps to expand the capacity to construct individual ‘exit routes’ out of poverty by enhancing capacity against seasonality and the exposure to stresses, thereby reducing vulnerability, providing opportunity for investment in different livelihood assets (agriculture, education, and so forth), and increase the chances to initiate a way out of poverty (Ellis, 2003). Thus, migration of the poor can be described “as both a *necessity*—part of a coping strategy for families experiencing extreme hardship—and an *opportunity*—a means of expanding a household’s livelihoods and ability to accumulate assets” (United Nations Development Programme, 2009: 16). Small-scale fishers in our case are found to migrate to escape vulnerability, interrupt their poverty or, most importantly, to enhance their capacities and opportunities. In this process, divided fishing households are connected through a constant exchange of capital, goods, and information. The continuation of livelihood strategies at the place of origin and the emergence of strong economic and social ties across space leads to an increasing translocal organisation of migrant households. The extent to which such households can benefit from the geographic diversification greatly varies. Some migrants, often temporary ones, have been generally found to have difficulties using remittances for a long-term improvement of their situation. Thus, for this group of migrants, the translocality of their households basically works as a buffer to fall back during the period of crises, but does not facilitate a continuous improvement of the economic situation. Migrants with continuous income sources at the place of destination are generally better situated and are able to put income aside for future investments with poverty-averting potential. Based on these findings, we found a translocal perspective as a useful framework for a better understanding of migration dynamics in coastal small-scale fisheries in Bangladesh. The outcome of migration is not just a flow of remittances to the place of origin, but form a livelihood system as an organization of social spaces that embraces place of origin and place of destination ‘as a single social field, facilitating the circulation of people, resources and ideas’ (Greiner, 2011: 620). As it has been noticed by Steinbrink (2009: 413f.), it is virtually impossible to universally evaluate the benefits or disadvantages of translocality. We have seen that it can both help households to escape chronic poverty and reduce vulnerability, or reinforce and aggravate existing inequalities within and across communities. Nevertheless, measures to alleviate poverty and vulnerability have to acknowledge the translocal mode of many migrant households and have to consider translocal effects of any intervention. Adopting a translocal perspective in studying the migration-poverty-vulnerability nexus will help to capture the complexities of issues in this process that in turn will help to delineate effective policy for addressing poverty and vulnerability in translocal households.

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Notes

1. All this has to allow for the fact that migration can of course have also negative effects on poverty and vulnerability levels of migrant households (cf. de Haan 1999, p.21; Kothari 2003).
2. For example, the costs for buying and operating a fishing boat for one Hilsha season are estimated around 560,000 BDT (Department of Fisheries 2005: 120).
3. Small-scale fishing in Bangladesh is traditionally done by low-caste Hindu communities.
4. We encountered one family that, after covering treatment costs of around 8,000 BDT for the delivery of twins, now finds itself highly indebted. To cover the costs, they have taken up a loan from a *mohajon*.
5. In Chittagong, traditional fishers maintain locally organized and hereditary entitlements in open access fishery. This *faar* system is used as a way to access and use fishing space.

References

- Adger, W.N. 2006. Vulnerability. *Global Environmental Change*, 16(3), pp. 268-281.
- Afsar, R. 2002. Migration and rural livelihoods, in: K. A. Toufique and C. Turton (eds) *Hands Not Land: How Livelihoods are Changing in Rural Bangladesh*. (Dhaka, London: Bangladesh Institute of Development Studies and Department for International Development), pp. 89-96.
- Alkire, S. 2007. The Missing Dimensions of Poverty Data: Introduction to the Special Issue. *Oxford Development Studies*, 35(4), pp. 347-359.
- Amin, S.M.N., Rahman, M.A., Haldar, G.C., Mazid, M.A. and Milton, D. 2002. Population dynamics and stock assessment of Hilsa Shad, *Tenualosa ilisha* in Bangladesh. *Asian Fisheries Science*, 15(2), pp. 123-128.
- Atkinson, A.B. 1987. On the Measurement of Poverty. *Econometrica*, 55(4), pp. 749-764.
- Bailey, A.J. 2011. Population geographies and climate change. *Progress in Human Geography*, 35(5), pp. 686-695.
- Béné, C. 2003. When Fishery Rhymes with Poverty: A First Step Beyond the Old Paradigm on Poverty in Small-Scale Fisheries. *World Development*, 31(6), pp. 949-975.
- Béné, C. 2009. Are Fishers Poor or Vulnerable? Assessing Economic Vulnerability in Small-Scale Fishing Communities. *Journal of Development Studies*, 45(6), pp. 911-933.
- Béné, C. and Friend, R.M. 2011. Poverty in small-scale fisheries Old issue, new analysis. *Progress in Development Studies*, 11(2), pp. 119-144.
- Carter, M.R. and Barrett, C.B. 2006. The economics of poverty traps and persistent poverty: An asset-based approach. *Journal of Development Studies*, 42(2), pp. 178-199.
- Chambers, R. 1989. Editorial Introduction: Vulnerability, Coping and Policy. *IDS Bulletin*, 20(2), pp. 1-7.
- de Haan, A. 1999. Livelihoods and poverty: The role of migration - a critical review of the migration literature. *Journal of Development Studies*, 36(2), pp. 1-47.
- Deb, U.K., Rao, G.D.N., Rao, Y.M. and Slater, R. 2002. *Diversification and Livelihood Options: A Study of Two Villages in Andhra Pradesh, India, 1975-2001* (London: Overseas Development Institute).
- Department of Fisheries 2005. *Hilsha Conservation and Management. Training Manual* (Dhaka: Department of Fisheries).
- Ellis, F. 2003. *A livelihoods approach to migration and poverty reduction* (London: Department for International Development).
- Findlay A. M. 2005. Editorial: Vulnerable spatialities. *Population Space and Place*, 11, pp 429-439.
- Greiner, C. 2010. Patterns of Translocality: Migration, Livelihoods and Identities in Northwest Namibia. *Sociologus*, 60(2), pp. 131-161.
- Greiner, C. 2011. Migration, Translocal Networks and Socio-Economic Stratification in Namibia. *Africa: The Journal of the International African Institute*, 81(4), pp. 606-627.
- International Development Committee 2004. *Migration and Development: How to make migration work for poverty reduction. Sixth Report of Session 2003-04, Volume I* (London: House of Commons).
- Islam, M.M. 2011. Living on the Margin: The Poverty-Vulnerability Nexus in the Small-Scale Fisheries of Bangladesh, in: S. Jentoft and A. Eide (eds) *Poverty Mosaics: Realities and Prospects in Small-Scale Fisheries*. (Dordrecht, Heidelberg, London, New York: Springer), pp. 71-95.
- Jentoft, S. and Midré, G. 2011. The Meaning of Poverty: Conceptual Issues in Small-Scale Fisheries Research, in: S. Jentoft and A. Eide (eds) *Poverty Mosaics: Realities and Prospects in Small-Scale Fisheries*. (Dordrecht, Heidelberg, London, New York: Springer), pp. 43-68.
- Kabir, S.H. 2006. *Hilsha* [Online]. Asiatic Society of Bangladesh. Available: http://www.banglapedia.org/httpdocs/HT/H_0123.HTM [accessed 02.11. 2011].
- Kothari, U. 2003. Staying put and staying poor? *Journal of International Development*, 15(5), pp. 645-657.

- Lein, H. 2000. Hazards and 'forced' migration in Bangladesh. *Norsk Geografisk Tidsskrift - Norwegian Journal of Geography*, 54(3), pp. 122-127.
- Lohnert, B. and Steinbrink, M. 2005. Rural and urban livelihoods: a translocal perspective in a south african context. *South African Geographical Journal*, 87(2), pp. 95 - 103.
- Long, N. 2008. Translocal Livelihoods, Networks of Family and Community, and Remittances in Central Peru, in: J. DeWind and J. Holdaway (eds) *Migration and Development Within and Across Borders: Research and Policy Perspectives on Internal and International Migration*. (Geneva, New York: International Organization for Migration), pp. 37-68.
- Marquette, C.M., Koranteng, K.A., Overå, R. and Aryeetey, E.B.-D. 2002. Small-scale Fisheries, Population Dynamics, and Resource Use in Africa: The Case of Moree, Ghana. *AMBIO: A Journal of the Human Environment*, 31(4), pp. 324-336.
- McCulloch, N. and Calandrino, M. 2003. Vulnerability and Chronic Poverty in Rural Sichuan. *World Development*, 31(3), pp. 611-628.
- Nabi, M.R. and Ullah, M.H. 2012. Effects of Set Bagnet fisheries on the shallow coastal ecosystem of the Bay of Bengal. *Ocean & Coastal Management*, 67, pp. 75-86.
- Njock, J.-C. and Westlund, L. 2010. Migration, resource management and global change: Experiences from fishing communities in West and Central Africa. *Marine Policy*, 34(4), pp. 752-760.
- Notten, G. and De Neubourg, C. 2011. Monitoring absolute and relative poverty: 'not enough' is not the same as 'much less'. *Review of Income and Wealth*, 57(2), pp. 247-269.
- Nunan, F. 2010. Mobility and fisherfolk livelihoods on Lake Victoria: Implications for vulnerability and risk. *Geoforum*, 41(5), pp. 776-785.
- Overå, R. 2001 Institutions, mobility and resilience in the Fante migratory fisheries of West Africa. CMI Working Paper, 2001:2 Chr. Michelsen Institute.
- Platteau, J.-P. 1995. A framework for the analysis of evolving patron-client ties in agrarian economies. *World Development*, 23(5), pp. 767-786.
- Rogaly, B. and Rafique, A. 2003. Struggling to Save Cash: Seasonal Migration and Vulnerability in West Bengal, India. *Development and Change*, 34(4), pp. 659-681.
- Sen, A. 1981a. Ingredients of Famine Analysis: Availability and Entitlements. *The Quarterly Journal of Economics*, 96(3), pp. 433-464.
- Sen, A. 1981b. *Poverty and Famines. An Essay on Entitlement and Deprivation* (Oxford: Clarendon Press).
- Sen, A.K. 1999. *Development as freedom* (New York: Anchor Books).
- Steinbrink, M. 2009. *Leben zwischen Stadt und Land. Migration, Translokalität und Verwundbarkeit in Südafrika* (Wiesbaden: VS Verlag für Sozialwissenschaften).
- United Nations Development Programme 2009. *Human Development Report: Overcoming Barriers: Human Mobility and Development* (New York: Palgrave Macmillan).
- Warner, K., Afifi, T., Stal, M. and Dun, O. 2009. Researching environmental change and migration: evaluation of EACH-FOR methodology and application in 23 case studies worldwide, in: F. Laczko and C. Aghazarm (eds) *Migration, Environment and Climate Change: Assessing the Evidence*. (Geneva: International Organization for Migration), pp. 197-244.
- Watts, M.J. and Bohle, H.G. 1993. The space of vulnerability: the causal structure of hunger and famine. *Progress in Human Geography*, 17(1), pp. 43-67.

Paper V

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Freedom and poverty in the fishery commons¹

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Abstract: Poverty was at the heart of the tragedy of the commons discourse from the very beginning. The idea was that commoners would inevitably end up deprived due to their own resource overuse. As Hardin saw it, if the initial problem was freedom of the commons, then limiting that freedom would logically reduce poverty. In this article, we argue that alleviating poverty among resource users calls for a broader concept of freedom than Hardin's – one that is more in line with that of Amartya Sen's "freedom as agency." Based on case-studies of small-scale fisheries and poverty in Bangladesh and Tanzania, we claim that the root of the tragedy of the commons is the restriction of freedom rather than unlimited freedom and that it is arguable whether the people who have no other option than to continue fishing for their livelihood, even in over-exploited ecosystems, could be understood to be free.

Keywords: Capability deprivation, common pool resources, governance, poverty, small-scale fisheries

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“Freedoms are not only the primary ends of development, they are also among its principal means.” Amartya Sen (1999, 10)

I. Introduction

In his 1833 Oxford University lecture series, William Foster Lloyd explained poverty by using an analogy between a pastoral commons and the English labour market and between a calf and a human child where the calf is equipped with “a set of teeth and the ability to graze” and the child with “a pair of hands competent to work” (Lloyd, in Hardin and Baden 1977, 11). In both instances, unlimited access would inevitably ruin the commons – whether that is the pasture or the labour market – and create human misery. Inspired by Lloyd, more than a century later Garrett Hardin (1968 and 1998) argued in a much cited quote that “freedom in a commons brings ruin to all.” Consistent with bio-economic modeling of human behaviour in open access fisheries (Gordon 1954), this statement has inspired researchers and practitioners alike to believe that limiting the freedom of access and operation in the fishery commons is the key to sustainable resource management and poverty alleviation among small-scale fishers around the world.

In this article, we argue that in order to sustain the resource while alleviating poverty among small-scale fishers – and indeed for common pool resource users in general, a broader idea of freedom than Hardin’s notion of “freedom in a commons” is needed. We suggest instead a concept more in line with what Amartya Sen² proposes in his book “Development as Freedom”, that is, freedom as agency (Sen 1999). Unlike what Hardin proposes and fishery resource management worldwide has embraced, Sen’s concept leads to a governance approach that intends to enhance the freedom of small-scale fishers rather than to limit it. Where Hardin recommended a mechanism that would effectively close what is often the last free space of manoeuvre for deprived small-scale fishers, in Amartya Sen’s conceptualization, fisheries governance would be about providing small-scale fishers with the “entitlements” and “capabilities” they need in order to live better.

Drawing on case studies of small-scale fisheries in Bangladesh and Tanzania, we aim to demonstrate the relevance of Sen’s broader concept of freedom as being the one that should underpin resource governance and poverty alleviation. The two studies show how small-scale fishers are in need of a great number of entitlements and capabilities that are essential in order for them and their dependents to enjoy secure livelihoods and “to lead the kind of lives that they value – and have reason to value” (Sen 1999, 18). Under conditions that are both similar and dissimilar in the two situations, small-scale fishers face a limited set of opportunities and entitlements, many of which are obvious targets for governance reform. They are also short of a number of capabilities that they would need in

² Amartya Sen is the 1998 Nobel Price Winner in Economics.

order to sustain their resource and pursue alternative or additional sources of livelihood. Following Sen's analysis of the elements constitutive of freedom and essential for development, the presentations are organized around the following issues: a) eco-system characteristics and pressure on resources; b) social and economic opportunities and capabilities, and; c) institutions and entitlements. Sen's framework is then the heuristic we use to reflect on the lessons learned with regard to the governance of common pool fishery resources and poverty alleviation among small-scale fishers.

2. Bangladesh: The South-eastern Coast

“First we have to survive, then the question of education”

The following analysis is based mainly on Islam (2008).

a) Eco-system and resource pressure: In Bangladesh, small-scale fisheries account for about 1.5 million fishers and ~10 million more people who live in households indirectly dependent on fisheries for their livelihood. Small-scale fisheries in the Bay of Bengal contribute about 93% of the total marine fish production in Bangladesh (BBS 2006; Bangladesh Economic Review 2008). The species Hilsha (*Tenuolosa ilisha*) constitutes the largest single fishery in Bangladesh, contributing about 16.4% of the country's total fish production. The Hilsha is moderately sized (up to 60 cm in total length and up to 2.5 kg in weight) and obtains a high price in local and international markets. It is estimated that about 2 million fishers and traders are directly and indirectly engaged in Hilsha fisheries. Most small-scale coastal fishers rely on these fisheries for their yearly income (Kabir 2006). The Hilsha fishery is seasonal with the peak season lasting for only about four months of the year. During the other eight months, small-scale fishers mostly use set bag nets to catch other species, which are short-lived and small-sized (e.g. Sergestid shrimp, *Acetes* spp.).

The Bay of Bengal is one of the most disaster prone regions in the world. Cyclones and tropical storms are yearly phenomena. In addition, the tidal activity is becoming increasingly turbulent making fishing operations risky and limited. Rough seas, as well as frequent cyclones often force coastal fishers to stay home or to abandon their incomplete fishing trips. Yet, due to very limited options for survival, many fishers defy warnings and continue fishing, which results in many fatalities every year (Ahmed and Neelormi 2008). Thus, small-scale fishers are not only poor; they are also extremely vulnerable. Their communities are often isolated, usually located near their workplace on the beach or nearby *khas* (government owned) land. This makes them predisposed to natural disasters. When disasters strike, families have to rebuild their lives and livelihoods from scratch. Limited finances make it difficult to restore homes and infrastructure. The loss of fishing gears, boats, livestock and other household assets can wipe out livelihoods. Moreover, the accompanying loss of paddy fields and other food

source can worsen food insecurity along the coast, which often leads to health problems. The death of a household member capable of working can bring the whole family into extreme poverty and extended trauma.

Fishers ultimately cope in the only way they are capable of, that is by putting more pressure on common pool marine resources. Some of the strategies only exacerbate their vulnerability by depleting the resource base. For instance, the set bag net widely used by small-scale fishers along the coast of Bangladesh has been blamed for catching undersized fish due to the use of a small mesh. During the breeding season, many species (including Hilsha) are also targeted. Fry collection (of very juvenile shrimp species) continues despite a ban. Illegal fishing (e.g. catching juvenile species of Hilsha) and the use of illegal gears (e.g. monofilament fishing nets) are also widespread, and in some cases, fishers pay bribes to the local law enforcement personnel. At St. Martin's Island, which is a protected area, the collection of seaweed and coral extraction continues to defy an existing prohibition. During the lean season, people also try to earn extra money by targeting previously non-targeted (e.g. shark species) and protected species (e.g. lobster).

b) Opportunities, capabilities and agency: Due to their distance from public facility hubs, fishing communities along the coast are usually the last to gain from economic development. They are also unlikely to reap the benefits of rehabilitation programs, such as food for work, unless such programs specifically target fishers. Fishers lack alternative capabilities to fishing and are therefore generally reluctant to seek other jobs. Sometimes in order to receive assistance, such as cash or ration cards for food, they have to bribe the local government official concerned. There are critical food shortages, particularly after a cyclone, and erratic production exhausts fishers' savings and entraps them into debt.

Sen argues that it is important to assess capability deprivation at a lower level than the household and that women's empowerment and freedom is essential to development (Sen 1999, 115). The erosion of income from fishing has increased the participation of women in income generating activities, like fish marketing or fish drying, and women have in many instances become the financial mainstay of the fisher household. Many young girls work in readymade garments factories. Although women in fishing households increasingly become active in income generation, they still suffer from discrimination in many ways. For instance, the wage paid to women in this area is usually much lower than what their male counterpart earns for doing the same job (see also Kleih et al. 2003). Women are frequently cheated when selling of fish products. Another problem is the dowry required when a daughter gets married. Girls are considered to be a liability and the number of daughters is perceived as an indicator of poverty.

A number of other entitlement shortages also limit the opportunities of small-scale fishers and increase their vulnerability. Given the fact that about 54% of the coastal communities in Bangladesh are functionally landless and more than 30% are absolutely landless (Islam 2006), most of the coastal fishing families

are also landless. They do not enjoy the insurance that ownership of land (an “exchange entitlement” – Sen 1981) can offer against a sudden loss of livelihood options. The few who do possess land only have a marginal quantity and since it is insufficient as a means for generating additional income, it is mostly used for family settlement. Another entitlement deficiency is the poor transportation system that inhibits fishers from having easy and expedient access to the markets. It also paves the way for the money lender – the *dadondar* – to gain bargaining power over them. As a consequence, fishers lose. For example one fisher from Teknaf coast of Cox’s Bazar district said: *“Here, our fish are cheaper than water. Due to poor transport from here to Teknaf market, we are deprived miserably to get the price of product. Can you imagine only 10 BDT/kg fish (about \$0.15/kg)? The same fish can be sold 100 BDT (\$1.45/kg) in Teknaf market (only 7 km away from here).”*³

Good health is essential for generating income, but frequent bouts of illness often impair fishers’ capability to work. Causes of the most prevalent illnesses can usually be linked to lack of knowledge about and access to proper sanitation. Sanitation facilities in fishing villages are poorly developed; most households use pit latrines. Illness, especially among the earning members, is one of the major causes of families getting pushed into poverty. It often leads to family bankruptcy and even poorer health because the cost of medicine is often paid by reducing the frequency of meals or, in extreme cases, with the starvation of family members.

Livelihoods of fishers are also vulnerable because of the risk of sea piracy. This risk is particularly severe during the Hilsha fishing season. Sometimes fishers are kidnapped for ransom. Fishers are always afraid of being assaulted, and they are particularly concerned that someone will snatch their productive assets like boats or nets. Ironically, the pirated property is then sold back to the fishers through brokers or through their own contact with the robbers. Elected local government officials tend to be blind to the welfare concerns of the fishing community. One fisher from Katghar in Chittagong district complained about local government representatives: *“They just come to us when they need our votes for election. After being elected they just forget us. Even if police harasses us in front of our commissioner, he doesn’t protect us. We are unable to elect our own representative as we do not have power and money. We do not even have a suitable candidate from our own community because we are all illiterate.”*

As in many other rural communities, the rate of illiteracy in fishing communities is very high. Schools are in many cases inaccessible due to the poor condition of the roads and/or long distances. Other impediments for children to complete school include large families and the subsequent educational expenses and the necessity for the children to work to supplement the family income. As stated by one fisher: *“I know that to educate children is a good thing. Since I am poor, I have to take my child fishing because I need a helping hand. If I hire another*

³ Interview in a Bengali daily newspaper, Prothom Alo on 4th February, 2008.

person to go with me I have to pay the wage even if I do not get any [fish]. For example today we [he, his wife and child] earned 170 Taka [about \$2.5] for two day's fishing. If I took another person [required if he sent his child to school] I had to pay him at least 100 Taka [\$1.5]. How is it possible to maintain my family of six members with 70 Taka [\$1] for two days?"

Fishers' access to the formal credit market (i.e. banks) is very limited due to lack of collateral assets like landed property; therefore, they are dependent on informal credit mechanisms. The informal *dadon* system has been blamed for exploiting the fishers. *Dadon* is a transaction built upon an uneven lending contract (often verbal) between the fisher and the lender. The transaction favours the lender/purchaser, because even before production the fisher has to agree to sell the produce to him at a price much lower (i.e. usually about 20%–40%) than the normal market price or against a certain percentage of commission (e.g. 5%–10% of sales revenue). The *dadon* is considered to be an advance or loan for the fishing season and binds the fishers to the money lender. This means that regardless of the amount of money owed, the borrowers must give all the fish they catch to the *dadondar* who gives them the loan and they must accept the price that he determines (Habib 2001). If they try to bargain, the money lender will just reduce the price of the previous bid as a form of punishment. Thus, the *dadondar* becomes the *de facto* owner of the family's productive assets and fish catches. He will allow at least three fishing seasons for the loan defaulter to repay loans. If there is a failure, the *dadondar* may confiscate the fisher's productive assets like boats, nets, home or homestead land. A fisher said: "*Dadon means selling everything to the Paiker (the word for money lender). It is not only your fish but also your freedom, boats, nets, etc. But we have no way of being free from it*" (quoted in Alam 1996, 109).

Poor representation of coastal communities in the power structure is another capability handicap (Kleih et al. 2003). The small-scale fishers of the south-eastern coast of Bangladesh are for the most part not well organized. The existing traditional organization (*samaj*) is not effective enough to promote their interests, as they have poor representation in the local administrative structures. Many fishers reported that high installment and maintenance fees were impediments for joining cooperative organizations (Islam 2006). Some fishers also blamed the *dadondar* who would not want them to have such an organization out of fear of losing control. Also, Bangladesh is well known for its non-government organization (NGO) activity, but comparatively few NGOs work with coastal fishers (see also Kleih et al. 2003, 93). One reason for limited NGO assistance is the geographical remoteness of fishing communities. Another reason is that fishers, due to uncertain incomes, have difficulties serving debt even on microcredit, an arrangement that has overall been very successful in supporting the poor in Bangladesh, particularly women (Sen 1999, 201).

c) Institutions and entitlements: Poor governing institutions are the most important development constraints in Bangladesh (DFID 1998, quoted in Kleih et al. 2003).

In contrast to inland fisheries where a number of management approaches have been tested, coastal small-scale fisheries in Bangladesh suffer from a chronic lack of well-planned management and governance initiatives. The existing governance structure is top-down, and the management bodies prioritize economic benefits while largely ignoring the complex marine ecosystem. The management system is short on manpower for monitoring, evaluation, and supervision, which is a major impediment for effective implementation of development projects in small-scale fisheries (Islam 2003). Similar to the situation in other developing nations, there is in Bangladesh a shortage of resource management expertise in proportion to the pressures that coastal fisheries are exposed to. Scientific expertise and advice are not much recognized by policymakers and management agencies (Islam 2003). Finally, and above all, population growth has fuelled the overexploitation of coastal fisheries and increased the risks of governance failure (Islam 2003).

Marine fisheries are mainly regulated by the Marine Fisheries Ordinance of 1983. According to this ordinance, small-scale coastal fishers can fish in the coastal waters within 40 m depth at the highest tide. The ordinance excludes industrial trawlers from this zone. Small-scale fishers can also use the nearby beach area for fish landing or ancillary work. Even though traditionally small-scale coastal fishers enjoy open access to fisheries resources, their access is often restricted, still. For instance, industrial fishing trawlers who are supposed to fish in waters beyond 40 m depth often fish much closer to shore where they are not allowed (at 30 m and even up to 20 m depth). Fishers interviewed for this study complained that their fishery has suffered when their areas are invaded and their nets are destroyed by the industrial trawlers and that conflicts have been escalating.

This ordinance fixes the mesh size of most commonly used small-scale fishing gear, for example, the set bag net as 30 mm at the cod end. The ordinance also prohibits fishing with underspecified mesh size, with any kind of explosives, poison and other noxious substances, or by electrocuting any type of the marine species. Similarly, there is a ban on collecting shrimp fry from natural sources, a practice widely blamed for the massive destruction of other fish fry and fish populations as by-catch. But shrimp fry collectors are mostly poor, uneducated and marginalized people in coastal communities (Ahmed et al. 2010). Efforts to enforce this ban are foiled when taking into account the socio-economic conditions of the shrimp fry collectors, as well as the lack of proper guidelines and scope for the rehabilitation of fry collectors (Islam 2003).

As an open access fishery, there is no state-allocated legal ownership of the fishing area. However, small-scale fishers maintain socially organized, locally enforceable, and hereditary entitlements in the fishing area within their community. This system, known locally as *Pata*, has been used as a way to avoid chaos and conflict among fishers regarding access and use of fishing space. The *Pata* is subdivided into smaller parts known as *Faar*. It is *Faar* that grants the fishing rights to each fisher, which is a practice that has been going on for generations. Even though this resource use right is transferable and can be sold for cash or

in-kind, it is not legally endorsed by the state. Further, this fishing entitlement is facing difficulties due to pressure of the increased population, new entrants into the fishery as well as intrusion by industrial fishers.

Summary: The Bangladesh case study is as much about vulnerability as it is about poverty. Both are closely linked but not exactly the same. Natural disasters are frequent and hard to escape. When their assets are destroyed, small-scale fishers have to rebuild their lives, but entitlement and capability deprivation, the lack of support or alternative skills to fishing, keep them trapped in a resource dependency that lead them to increase the pressure on the marine ecosystem, often by using destructive gear or targeting protected species. New entrants into the fishery add to this problem. But small-scale fishers' vulnerability is also exacerbated by social mechanisms, such as underperforming institutions and lack of the security that ownership to land provides. Without a functioning health care and welfare system, the death or illness of a family member may be disastrous. In many instances fishers' livelihoods are exposed to maltreatment by middlemen or government officials unable to provide "protective security" as a basic instrumental entitlement (Sen 1999, 184–185).

3. Tanzania: Lake Victoria

"If we can break our dependency on fish agents, it would probably be possible to get better prices for our catches"

The case study is based mainly on Onyango (2004).

a) Eco-system and resource pressure: With a surface area of about 68,800 km², Lake Victoria is Africa's largest freshwater lake. It is shared between Kenya (6%), Tanzania (51%) and Uganda (43%) (RoK, RU and URT 1995). Fisheries and agriculture are the dominant socio-economic activities within the lake area. Fishery biologists have noted high natural productivity, which has resulted in some of the greatest diversity of endemic species of cichlids (Johnson et al. 2000). This has changed over time, however, and the lake is currently dominated by three commercial species, namely the introduced Nile perch (*Lates niloticus*), Tilapia (*Oreochromis niloticus*) and small pelagic sardines (*Rastreneobola argentea*) (Cowx et al. 2003; Njiru et al. 2005).

Lake Victoria is very important to the economies of its riparian states, with an estimated annual fish landing of 778,840 tons, worth US\$366 million at the beach, i.e. before any value addition (LVFO 2005). According to a statistic in 2005, the lake fishery supports large fish exports estimated at 100,914 tons of Nile perch valued at US\$306 million annually. The lake provides high protein food, employment, income, and water for domestic and industrial use. The dynamics of the fishery of Lake Victoria have changed considerably since the beginning of the Nile perch fishery in the late 1970s (Acere 1985, 1995) and

the subsequent evolution of fish processing for export. The readily external market for Nile perch has fuelled rapid increase in fishing effort. Fish export is among the major foreign exchange earners of the partner states.

In Tanzania, the lake fishery involves an ever increasing number of fishers, from 55,985 in 2000 to 105,019 in 2008. Likewise, the number of fishing crafts increased from 15,490 in 2000 to 30,205 in 2008 (LVFO 2009). The lake has also provided the major part of the overall fishery contribution to the Tanzanian economy, generating an average of US\$100 million to the central government on an annual basis since the late 1990s (Onyango 2005, 2009).

Despite these contributions, many fishing villages are still deprived of a number of capabilities and entitlements that they need in order reap the benefits of these resources. Many of the communities are reached only by dirt roads which are hardly passable during the rainy season. They have inadequate healthcare facilities and water supply. Fishers and their families remain inadequately nourished and are not protected from avoidable diseases. They also have no sustainable energy for cooking, and they have to cope with extreme natural events including floods, tropical storms and crocodile attacks. It is also a paradox that the price of fish that fishers earn is only 1 USD/kg of fish (Odongkara et al. 2005) when the reported wealth that fisheries generate for the riparian countries is so immense (Barth 1997).

We describe how this paradox and the consequences that follow have transpired in two Lake Victorian communities: Wakerewe and Kakseru. Wakerewe is among the oldest communities settled on the biggest island of the lake. The Wakerewe people are known historically to cherish cichlid fishes (Onyango 2004). The Kakseru settled in the lake region after the Wakerewe. They were not historically a fishing community as the Wakerewe had been but learned to fish when they arrived in the lake area.

The changes in the fisheries of the lake, which has seen a complete shift of fish stocks composed of cichlids to stocks composed of Nile perch, major predators of native cichlids (Kolding et al. 2008), have led to a situation where fishers in these communities can only fish for Nile perch, Tilapia, and Dagaa (Sardine). From our observations, these species are targeted mainly for trade, which has stimulated an increase in fishing effort. Nile perch goes to processing establishments for export. Dagaa finds a local market in the production of animal feed (Abila and Jansen 1997). Tilapia, which is the only species that remains for local consumption, has attracted more and more fishers because it is now in high demand at the local hotels. The rise of the number of visitors to the area and the increasing demand for fish by hotels have reduced the availability of these species to the local communities. Therefore, as Geheb (2008) reports, malnutrition in the lake region can in part be explained by the dynamics of the fish market.

A shift in the species composition has also led to changes in fishing gears and techniques. Gears, such as basket traps and spears have been replaced by gillnets, drift nets, long lines and beach seines (which are illegal in the lake). Fishers have

also developed drift netting, expanded the width and length of gillnets (including changing from nets made of cotton thread to those made of nylon), and increased the number of fishing days and the length of time they leave their nets in the water each day. Fishers have also mechanized their operations to enable fishing in deep waters. Some of these gears and fishing methods lead to overfishing and degradation of fish habitats (LVFO 2009).

b) Opportunities, capabilities and agency: The boom of the Nile perch has strongly impacted on the nature of the fishery of the lake (Ligtvoet et al. 1995). Besides the changes in fishing gear, fillet processing industries have been established. The boom has also attracted people from non-riparian communities into the fishery where livelihoods are in short supply in local communities. The poor performance of agriculture due to drought and seasonal lack of rain, a crisis in the mining industry, and limitations to local participation in the tourism sector in the lake region, have led to entry into the fisheries from these other sectors (Geheb and Binns 1997). In fact, lake fisheries have become the only opportunity available and a valuable safety-net for people once involved in farming or mining.

Formally, the fishery in Lake Victoria is open access. People regard the provision of food a God-given entitlement. Among the Kakseru for instance, the demand for *mboga* (a Kiswahili word for the main dish in a meal) coupled with the limitation of the food supply have led fishers to follow the principle of not hindering others from fishing. A fisher is allowed to catch to feed his family, and no person has the right to stop another person from fishing. Fishers, therefore, discourage controls on access, and they will normally abstain from reporting on their fellow fishers when using illegal fishing gears such as beach seines, small-sized nets and monofilaments.

The notion of open access, however, has not transpired into a functioning freedom because the capital outlay capability required to fish is indeed colossal. In order to fish, a fisher needs a boat and fishing gears, costing anywhere between US\$800 and US\$1500. People who cannot afford the investment in boat and gear can still become crew on larger boats that operate offshore. The owners of these vessels provide crew members with only the most basic needs, such as shelter and food.

Low educational attainment is among the key capability deprivations characterising the Wakerewe and Kakseru small-scale fishers. Most of them have only some primary/basic education and many are illiterate (Onyango 2005). Working in fisheries does not require any skills that would be gained from going to school. When asked about education, one fisher said: “*Why should I have to go to school when I can make money from fish?*” A majority of those who get past the primary level still come back to the fishery and therefore create a perception that there is no reason for wasting time and money on education beyond the primary level. Fishers are therefore born into families where members have low education and they grow up among people who reject school and who do not perceive education as a means of generally improving their livelihood capabilities.

Fishers are trapped in a relationship with the middlemen (known in Lake Victoria as agents) who buy from the fishers and deliver to the fish processing establishments. The agents have designed a mechanism whereby they provide loans to fishers so that they can buy fishing gear, outboard engines and/or fishing boats and then the fishers are expected to repay the loan by selling all their catches to the agent. The agents also determine the price of fish that they are willing to pay. There are times when the agents hold back their payment until the fish is sold to the processing establishment. When time comes to pay, agents sometimes do not have the proper records of the total weight of fish and instead pay according to their own recollection. Fishers do not have proper mechanisms to bargain for higher prices and if they try to create one, the agents will come up with stringent conditions so that they can keep controlling the relationship. Therefore, fishers are rendered powerless and frustrated. All they are capable of is to accept what they are offered while striving to survive.

c) Institutions and entitlements: The Lake Victoria fisheries have been managed through single species models and a top-down, centralized system (Geheb et al. 2002; Kolding et al. 2008). Regulations are for the most part focused on the Nile perch and Tilapia. Gillnets were used as far back as 1908 (Geheb 1977; Njiru et al. 2006). The legal mesh size for this gear was recently increased from five to six inches. The legal six-inch mesh size gillnets target Nile perch and Tilapia fishes of between 50 and 85 cm total length. However, the currently resurging cichlids (Witte et al. 2000) are not within the length range that the six inch gillnets can catch, which has limited the catching of these species and subsequently, the freedom to fish for all the available resources in the lake. This has led to conflict with fisheries authorities, especially when fishers resort to use small-size gillnets to catch cichlids.

Although rarely documented, corruption in fisheries, including those in Lake Victoria, is recognized to be an issue (Standing 2008). With the commercialization of fisheries as a result of the Nile perch boom and an observed decline in catches, fishers have resorted to using illegal gears, such as beach seines. Other illegal fishing gears and techniques have also been recorded.⁴ Some fisheries personnel working to eradicate these illegal gears and techniques have been compromised by receiving payments to either release confiscated gears or to simply not confiscate them from illegal gear-users. Sometimes fishers collect money amongst themselves to redeem their gear from the fisheries officers.

The complexities associated with managing Lake Victoria fisheries are directly related to its status as a common-pool resource; with government as the ultimate owner (SEDAWOG 2000). Government ownership is deduced to mean open access by the local fishers (SEDAWOG 2000). As mentioned earlier, this perception of the lake's resources has led to the tremendous increase in the number of fishers, and consequently, a decrease of the resource, high competition

⁴ According to Internal Fisheries Division Reports on Monitoring, Control and Surveillance.

among fishers, theft of fishing gears, increasing use of illegal fishing gears (LVFO 2005). Also conflicts among fishers have increased, for instance related to gear entanglement, especially between gillnets and long lines (Kirema-Mukasa et al. 2005). Gillnetters have used fishing technology where the nets are set and allowed to drift in the lake to collect anything in their path, including long lines. This, in addition to limiting accessibility to the resource for those fishers who use long lines, has also resulted in destruction and loss of gears.

In response to this situation the management system was decentralized in the late 1990s and a co-management regime – the Beach Management Units (BMU) – was introduced to encourage fishers to become involved in the custody of the lake's fisheries resources. They were initiated before a legal framework was established, and they were ill-prepared to undertake the responsibilities assigned to them and to address competing interests among individual BMU members (Onyango 2004; URT 2005). The BMUs were born out of the reality that fishery authorities lacked the resources to effectively implement fisheries regulations. Resource ownership was not intended to be an essential part of the co-management establishment (Onyango 2004); rather, fishers were incorporated by being expected to commit themselves to following regulations, whereby much of what they did became illegal. The manner in which this co-management regime was established did not clearly address the rights issue concerning fish resources; by instead focusing on restrictive fishing regulations, the regime was vulnerable to internal dissension, as, for example, fishers publically criticized BMU leaders. Given that fishers were already facing hardships which they believed fisheries regulations had not resolved, they perceived the BMU to be irrelevant and found ways to work illegally.

Summary: Lake Victoria fisheries resources represent a considerable wealth that has given rise to a lucrative export oriented industry. However, benefits have not trickled down to communities; people are still undernourished and deprived of basic entitlements like healthcare, education, transportation, electricity and other community infrastructure. The opportunities of a free-for-all fishery commons to support small-scale fisheries and communities are weakened by lack of financial support, unregulated and illegal fishing, dwindling resources, asymmetric relationships of exchange, and ineffective organization. Thus, there is a parallel to Sen's observation pertaining to famine. It is not shortage of food *per se* that makes people undernourished, but the lack of secure access to food that is the problem. The latter is basically about the entitlements and capabilities that determine "the relationship of persons to the commodities" (Sen 1991, 1).

4. Discussion

According to Garrett Hardin, poverty results when resource users are pursuing their freedom in the commons. In Sen's judgment, poverty results from a deprivation of entitlements and capabilities that limit poor people's freedom to improve their lot. Hardin regards poverty as an outcome of overexploitation,

whereas Sen has something to teach us about what its causes are in a broader sense. Small-scale fishers are not always among the “the poorest of the poor” (Cf. Béné 2003; Garaway 2005; Thorpe et al. 2007; Béné et al. 2009). However, if we are to believe Garrett Hardin (and Scott Gordon), small-scale fishers are destined to become so. The WorldFish Centre and The Food and Agriculture Organization of the United Nations (FAO 2005) estimate that 23 million out of 150 million people in households that depend primarily on small-scale fisheries are living on the equivalent of one US\$ a day or less. Hardin provides a recipe for how to avoid such a tragic outcome, which is limiting the freedom that fishers are enjoying in the commons. Sen’s solution to the poverty problem goes in the opposite direction; that is to enhance their freedom, their freedom as agents in their own lives which depends on access to entitlements and capabilities.

The causes of resource degradation and poverty among small-scale fishers are no doubt complex. Malthusian overfishing may be one reason, as Hardin would predict. Poverty may well be a consequence, but it may also be a cause of overfishing, as when people in the Tanzania and Bangladesh case studies are forced to abandon other occupations and livelihoods to enter the fishery commons. But as demonstrated in both situations, the poverty of small-scale fishers typically involves a number of capability and entitlement deprivations that limit their freedom to improve their lives, including escaping the destiny that Hardin holds up for them. Therefore, as stressed by many of those who study small-scale fisheries, a richer model for defining, explaining, and dealing with poverty among small-scale fishers is called for (for example Macfadyen and Corocoran 2002; Béné 2003; Smith et al. 2005; FAO 2006; Thorpe et al. 2007; Béné and Friend 2009).

Since poverty can be both a cause and a consequence of overfishing, poverty alleviation strategies and policies would need to work at both ends. Limiting the freedom in the commons according to Hardin – by restricting and even commodifying access or by imposing strict rules – without supplying the entitlements and capabilities that Sen is talking about, can only make poor small-scale fishers even poorer (Stobutzki et al. 2006). These entitlements and capabilities include a bundle of essentials, such as education, healthcare, sanitation, electricity, communication, transportation, credit, and alternative and supplementary livelihood activities that would strengthen the income base and food security of small-scale fishers and reduce their vulnerability (Béné and Friend 2009; Kraan 2009). Resource management and community development in the broadest sense (which to Sen involve “expansion of capabilities”) must therefore go hand-in-hand in an integrated fashion (Bailey and Jentoft 1990), and would also have to include investments outside of the fisheries sector (Béné and Friend 2009).

It should be emphasized that raising peoples’ income is not the only thing that counts. As Sen (1983, 756) argues, “...when it comes to health, or education, or social equality, or self-respect, or freedom from social harassment, income is miles off the target.” Neither would increase in catch necessarily provide any secure supply of such entitlements, as stressed in an FAO report: “Poverty in fishery dependent communities ... is not solely related to the abundance of the catch, market

opportunities or the state of the resource. It is also critically dependent on how the benefits from the use of fishery and other resources are used and whether a range of basic services (e.g. in health and education) are provided” (FAO 2006, XIV).

In this article, we argue that a broader concept of freedom is needed than the kind of “freedom in a commons” that Garrett Hardin discussed. First of all, as demonstrated in the two case studies, in real life that freedom appears to be often more fictitious than real as it depends on entitlements and capabilities that are often not available to poor small-scale fishers. Besides, fishers whose only available option for survival is to continue fishing regardless of the state of the resource can hardly be said to be free. The freedom that follows from the entitlements and capabilities that Amartya Sen talks about – and which the small-scale fishers in the two regions clearly would benefit from – is not what will ruin the commons. Rather, Sen’s idea of freedom contains the conditions that would help them break out of the vicious circle of poverty they find themselves in. Quoting Marx, Sen says that his concept has to do with “replacing the domination of circumstances and change over individuals by the domination of individuals over chance and circumstances” (Sen 1983, 754).

Sen (2000) emphasizes “the complementarity that exists between individual agency and social arrangements,” such as institutions, and that it “is important to give simultaneous recognition to the centrality of individual freedom *and* to the force of social influences on the extent and reach of individual freedom” (Sen 1999, xii). For the poor, these influences may break both ways: they may suppress freedom, as is sometimes the case with traditional authorities in Africa and elsewhere (Jentoft 2004), but they may also be potentially empowering and therefore liberating, as Kraan (2009) describes in the case of small-scale fisheries in Ghana, and Menezes et al. (2009) for Mozambique. Notably, institutions that help people to deal with their individual and collective challenges are enhancing freedom even if they restrict individual choice, as resource management systems always do – or what in fact it means to be living in a community (Baumann 2001). The individual gain of mutual commitment outweighs individual sacrifice. A healthy ecosystem is also in the interest of small-scale fishers even if it may require limiting their freedom in the commons. But that sacrifice would be easier to bear if people had a broader set of entitlements and the capabilities to take advantage of the opportunities they have.

The case-study presentations are organized around Sen’s constitutive elements of freedom: a) eco-system characteristics and pressure, b) livelihood opportunities and capabilities, and c) institutional mechanisms and entitlements. As to the first element, they both emphasize the contribution of small-scale fisheries to food security and nutrition. Small-scale fishers are, however, vulnerable to the vagaries of nature, which as in the case of Bangladesh expose them to heavy risks. Sometimes they experience eco-system damage that reduces the diversity of the resource base, as with the Nile Perch in Lake Victoria. When small-scale fishers encounter a loss of income for these or other reasons, they take advantage of their

de jure “opportunity freedom” (Sen 1999, 17) of the commons by increasing or changing their fishing effort, in many instances by breaking the law. In the case of Lake Victoria, they do this by adopting illegal gear, such as small meshed gillnets, driftnets and beach seines, or they diversify by exploiting species that are threatened and sometimes protected like juvenile shrimp, shark or lobster, and coral extraction in Bangladesh. Another coping strategy is to extend the fishing period, which sometimes means taking greater risks during dangerous weather conditions as fishers in Bangladesh are forced to do.

The second constitutive element of small-scale fishers’ freedom pertains to livelihood opportunities and capabilities. In both regions described in this article, fisheries are by law open access and experiencing increases in fishing effort, partly due to more effective gear being adopted and because of an influx of newcomers from other sectors and regions. Newcomers are, however, often met with resistance by locals who experience that their fishing grounds are invaded and that their rules of tenure are not respected, as in Bangladesh. In neither case do we see people leave the fishery. Once they are in they stay. When alternative sources of livelihood do exist, small-scale fishers lack the entitlements and capabilities that would make them accessible. In Bangladesh credit for small-scale fishers is hard to obtain outside the informal *dadon* system, mobility and transportation is difficult, and illiteracy is widespread. Among small-scale fishers in Lake Victoria, education is often undervalued, whereas in the case of Bangladesh it is considered a luxury poor fishers feel that they cannot afford.

As is often the situation in small-scale fisheries globally, fishers are the weaker party in asymmetrical exchange relations, notably the *dadon* system in Bangladesh and its equivalent fish agents in Lake Victoria. Unions and cooperatives that could liberate small-scale fishers from the bond with the middleman/moneylender are non-existent. In the two situations, small-scale fishers have experienced that when they tried to liberate themselves from the middleman, they are punished with lower prices or harsher demands. Such relationships exemplify the “unfreedoms” that leave people with no ability to exercise “their reasoned agency.” Removing these “unfreedoms” is therefore “constitutive of development” (Sen 1999, xii – italics in the original).

Fisheries development should therefore begin with Sen’s realization that poverty essentially involves relationships to things, to people and to institutions that limit their action space, deny them of basic entitlements, and block them from developing and employing their individual and collective capabilities.⁵ As Cleaver (2005) also argues, poor peoples’ agency and room of manoeuvre are critically restricted or enabled by their social relationships, whereas Gore emphasizes that entitlement analysis must incorporate “power relationships and discursive

⁵ In his most recent book, Sen takes issue with the criticism that he sees capabilities only as an attribute of individuals. He insists that there is “no great difficulty of thinking about capabilities of groups” such as communities (Sen 2009, 244). A number of these criticisms are presented in Comim et al. (2008) and Gore (1993).

practices”, including those that are non-state, informal and local (Gore 1993, 452). The relationship that small-scale fishers have with their money lenders in these two case studies are clearly of this nature.

In addition to opportunity freedom, Sen also stresses the importance of what he calls “process freedom” (Sen 1999, 17). The latter is about decision-making, democracy, participation, and transparency (Sen 1999, 127). Lake Victoria stands out with its Beach Management Units (BMUs). Although they may be criticized for not fully delivering on Sen’s criteria, or in some instance even working against them, they exemplify the social arrangements that could empower small-scale fishers and thus are in line with his views on development as freedom. Therefore, they represent a form of institutional arrangement at the local level that would be relevant also in the context of Bangladesh. When such arrangements do not work effectively in uplifting the poor while sustaining the resource, the remedy should be to try to fix them rather than to abandon them.

In both Bangladesh and Tanzania, the government is unable or unwilling to provide the “protective security” that Sen discusses and which the philosopher Isaiah Berlin (1969) called “negative freedom.”⁶ In Bangladesh, small-scale fishers experience assaults on the fishing grounds, theft of fishing gear, or invasion of the fishing grounds that are reserved for them. In both places, fishers and fisher women experience being cheated by middlemen and harassment by public officials. They also experience pressure from newcomers into their fishing grounds by people who disrespect their tenure (the *Pata* hereditary system) or by industrial vessels who do not recognize the zone that have been allotted to small-scale fisheries. In both instances government backup is missing.

5. Conclusion

According to Kooiman et al. (2005), fisheries governance is as much about creating opportunities as it is about problem solving. Governance would therefore aim to provide small-scale fishers with a broader set of opportunities, entitlements and capabilities than they currently have. Allison and Horemans (2006, 764) argue along the same line:

“It is the policies and institutions that determine access to assets, set the vulnerability context and determine people’s livelihood options, reactions and strategies, and ultimately the outcomes of those strategies in terms of their ability to make a living and willingness to invest in helping to conserve the natural resource base. Addressing governance therefore remains the key challenge for both poverty reduction and responsible fisheries.”

⁶ For Berlin “negative freedom” is freedom *from* hunger, exploitation and suppression whereas “positive freedom” is freedom *to* realize one’s potentials and opportunities.

The Bangladesh and Tanzania studies show how catastrophes such as hurricanes, floods or drought can destroy essential livelihood entitlements for small-scale fishers. They also demonstrate how small-scale fishers become victims of social and institutional forces, which are difficult to change from the bottom-up because they require the sort of entitlements and capabilities that small-scale fishers typically do not have. The two case studies suggest that poverty alleviation and resource management requires a governance approach that covers the full range of entitlements that Sen is talking about. Poverty alleviation and resource management are also about building capability at individual, household, community and government levels.

As demonstrated in both Bangladesh and Tanzania, a fishery commons in danger of collapsing due to overuse and ecologically destructive fishing practices would obviously require urgent measures, but limiting the “opportunity freedom” of small-scale fishers “locked in the logic of the commons” (Hardin 1968, 1248) is not the only thing that needs to be done. It may not even be a solution that would bring the most sustainable outcome. Rather, it would require a more comprehensive governance reform, a reform that would promote freedom both in a negative and positive sense (Berlin 1969; see also Sen 1989). Inspired by Amartya Sen, we have in this article questioned the very idea of what constitutes freedom in a fishery commons and argued that deeper reflection is needed than what it typically receives among policy makers, managers and academics who are inspired by Garrett Hardin. Rather than defining the tragedy of the commons as a market failure, it should be seen as an entitlement and a capability failure, similar to how Sen (1981) explains famine. It is somewhat ironic that Hardin is commonly perceived as having provided a simple, but elegant technical solution to the tragedy of the commons, i.e. limiting the freedom of resource users, yet his main argument is that this problem does not have a technical, scientific solution but one that would require “a change in human values or ideas of morality” (Hardin 1968, 1143). Limiting the freedom of small-scale fishers is obviously an issue of justice, particularly when poverty is the cause or outcome. (Justice is also a recurring theme in Sen’s work, including in his 2009 book.) But Hardin can hardly be held responsible for what his followers have done when putting his ideas into regulatory policy and practice. We believe, however, that as far as small-scale fishers are concerned, these policies, practices, and therefore outcomes, would have been very different from what they are today if it had been Sen’s, rather than Hardin’s idea of freedom that was at their roots.

Literature cited

Abila, R. O., and E. G. Jansen. 1997. From Local to Global Markets. The Fish Exporting and Fishmeal Industries of Lake Victoria – Structure, Strategies and Socio-economic Impacts in Kenya. *Socio-economics of the Lake Victoria Fisheries*. Report No. 2. IUCN Eastern Africa Program.

- Acere, T. O. 1985. Observations on the Biology, Age, Growth, Maturity and Sexuality of Nile Perch, *Lates niloticus* (Linne), and the Growth of its Fishery in the Northern waters of Lake Victoria. *FAO Fisheries Report* 335: 42–53.
- Acere, T. O. 1995. Population Dynamics of Nile Perch, *Lates niloticus* (Pisces: centralpomidae) in Lake Victoria, Uganda Waters. Ph.D. Thesis. Makerere University.
- Ahmed, A. U., and S. Neelormi. 2008. The Impacts of Climate Change on Marine Socio-ecological Systems: The Plight of Coastal Fisherfolk Communities in Bangladesh. Article presented at Coping with global change in marine social-ecological systems. Rome: FAO, 8–11 July.
- Ahmed, N., M. Troell, E. H. Allison, and J. F. Muir. 2010. Prawn Postlarvae Fishing in Coastal Bangladesh: Challenges for Sustainable Livelihoods. *Marine Policy* 34(2):218–227.
- Alam, K. 1996. *Two Fishing Villages of Bangladesh: A Community Study*. Ph.D. Dissertation Department of Development and Planning. Ålborg: Ålborg University.
- Allison, E. H., and F. Ellis. 2001. The Livelihood Approach and Management of Small-scale Fisheries. *Marine Policy* 25:377–388.
- Allison, E. H., and B. Horemans. 2006. Putting the Principles of the Sustainable Livelihoods Approach into Fisheries Development Policy and Practice. *Marine Policy* 30:757–766.
- Bailey, C., and S. Jentoft. 1990. Hard Choices in Fisheries Development. *Marine Policy*, July, 333–344.
- Bangladesh Economic Review 2008. *Agriculture (Chapter 7)*. Finance Division, Ministry of Finance, Government of The People's Republic of Bangladesh.
- Barth, F. 1997. Economy, Agency and Ordinary Lives. *Social Anthropology* 8:233–242.
- Baumann, Z. 2001. *Community: Seeking Safety in an Insecure World*. Cambridge: Polity Press.
- BBS. 2007. *Statistical Year Book of Bangladesh*. Dhaka: Bangladesh Bureau of Statistics.
- Béné, C. 2003. When Fishery Rhymes with Poverty: A First Step Beyond the Old Paradigm on Poverty in Small-Scale Fisheries. *World Development* 31(6): 941–975.
- Béné, C., E. Steel, B. Kambala Luadua, and A. Gordon. 2009. Fish as the “Bank in the Water.” Evidence from Chronic-poor Communities in Congo. *Food Policy* 34:104–118.
- Béné, C., and R. M. Friend. 2009. Water, Poverty and Inland Fisheries: Lessons from Africa and Asia. *Water International* 34(1):47–61.
- Béné, C., E. Belal, M. O. Baba, et al. 2009. Power Struggle, Dispute and Alliance of Local Resources: Analyzing ‘Democratic’ Decentralization of Natural Resources through the Lenses of Africa Inland Fisheries. *World Development* (article in press).

- Berlin, I. 1969. *Four Essays on Liberty*. London and New York: Oxford University Press.
- Cleaver, F. 2005. The Inequality of Social Capital and the Reproduction of Chronic Poverty. *World Development* 33(6):893–906.
- Comim, F., M. Qizilbash, and S. Alikre, eds. 2008. *The Capability Approach. Concepts, Measures and Applications*. Cambridge: Cambridge University Press.
- Cowx, I. G., M. van Knaap, L. van der Muhoozi, and A. Othina. 2003. Improving Fishery Catch Statistics for Lake Victoria. *Aquatic Ecosystems Health and Management* 6:299–310.
- FAO/WorldFish Centre. 2005. Towards an Interdisciplinary Approach to the Assessment of Small-Scale Fisheries and its Role in Food Security and Poverty Alleviation and Sustainable Resource Use. Concept note. Rome: The Food and Agriculture Organization of the United Nations.
- FAO. 2006. Increasing the Contribution of Small-scale Fisheries to Poverty Alleviation and Food Security. FAO Technical Guidelines for Responsible Fisheries. Rome: Food and Agriculture Organization of the United Nations.
- Garaway, C. 2005. Fish, Fishing and the Rural Poor. A Case Study of the Household Importance of Small-scale Fisheries in the Lao PDR. *Aquatic Resources, Culture and Development* 1(2):131–144.
- Geheb, K. 1997. The Regulators and the Regulated: Fisheries Management, Options and Dynamics in 108 Kenya's Lake Victoria Fishery. Unpublished D.Phil. Thesis, University of Sussex, Falmer, Brighton, U.K. Reprinted as LVFRP Technical Document No. 10. LVFRP/TECH/00/10. Jinja: The Socio-economic Data Working Group of the Lake Victoria Fisheries Research Project.
- Geheb, K., and T. Binns. 1997. Fishing Farmers' or 'Farming Fisherman'? The Quest for Household Income and Nutritional Security on the Kenyan Shores of Lake Victoria. *African Affairs* 96(382):73–93.
- Geheb, K., K. Crean, M. Medard, M. Kyangwa, C. Lwenya, and P. Onyango. 2002. On Pitfalls and Building Blocks: Towards the Management of Lake Victoria's Fisheries. In *Africa's Inland Fisheries: The Management Challenge*, eds. K. Geheb and M.-T. Sarch, 142–173. Fountain.
- Geheb, K., S. Kalloch, M. Medard, A. T. Nyapendi, C. Lwenya, and M. Kyangwa. 2008. Nile Perch and the Hungry of Lake Victoria: Gender, Status and Food in an East African Fishery. *Food Policy* 33:85–98.
- Gordon, S. 1954. The Economic Theory of a Common-Property Resource: The Fishery. *Journal of Political Economy* 62(2):124–142.
- Gore, C. 1993. Entitlement Relations and 'Unruly' Social Practices: A Comment on the Work of Amartya Sen. *The Journal of Development Studies* 29(3): 429–460.
- Habib, A. 2001. *Delipara: An Obscure Fishing Village of Bangladesh*. Chittagong, Bangladesh: CODEC.
- Hardin, G. 1968. The Tragedy of the Commons. *Science* 162:1143–1248.
- Hardin, G. 1998. Extensions of "The Tragedy of the Commons." *Science* 280(5364):682–683.

- Hardin, G., and J. Baden, eds. 1977. *Managing the Commons*. San Francisco: W.H. Freeman and Co.
- Islam, M. R. 2006. Managing Diverse Land Uses in Coastal Bangladesh: Institutional Approaches. In *Environment and Livelihoods in Tropical Coastal Zones*, eds. C. T. Hoanh, T. P. Tuong, J. W. Growing, and B. Hardy, 237–248. CAB International.
- Islam, M. S. 2003. Perspectives of the Coastal and Marine Fisheries of the Bay of Bengal, Bangladesh. *Ocean & Coastal Management* 46(8):763–796.
- Islam, M. M. 2008. *Living on the Margin: The Poverty-fisheries Nexus in Bangladesh*. Master Thesis. Tromsø: Norwegian College of Fishery Science, University of Tromsø.
- Jentoft, S. 2004. The Community in Fisheries Management: Challenges, Opportunities and Risks. In *Fisheries Development: The Institutional Challenge*, eds. B. Hersoug, S. Jentoft, and P. Degnbol, 93–129. Delft: Eburon.
- Jentoft, S. 2007. In the Power of Power: The Understated Aspect of Fisheries Management. *Human Organization* 66(4):426–437.
- Jentoft, S., and R. Chuenpagdee. 2009. Fisheries and Coastal Governance as a Wicked Problem. *Marine Policy* 33:553–560.
- Johnson, C. T., K. Kelts, and E. Odada. 2000. The Holocene History of Lake Victoria. *AMBIO Journal of Human Environment* 29(1):2–11.
- Kabir, S. M. H. 2006. Hilsha. In *Banglapedia: National Encyclopaedia of Bangladesh*, ed. S. Islam. Dhaka: Asiatic Society of Bangladesh. Online version <http://www.banglapedia.org/>.
- Kirema-Mukasa, C. T., J. P. Owino, and P. Onyango. 2005. Strategies for Management of Transboundary Conflicts on Fishing and Fish Trade. *Proceedings of the Regional Stakeholders Conference 24–25 February: The State of the Fisheries Resources of Lake Victoria and their Management; Concerns, Challenges and Opportunities*. EAC and LVFO, 172–176.
- Kleih, U., K. Alam, R. Dastidar, U. Dutta, N. Oudwater, and A. Ward. 2003. *Livelihoods in Coastal Fishing Communities, and the Marine Fish Marketing System of Bangladesh*. NRI Report No. 2712. London: Greenwich University, Natural Resources Institute.
- Kolding, J., P. van Zwieten, O. Mkumbo, G. Silsbe, and R. Hecky. 2008. Are the Lake Victoria Fisheries Threatened by Exploitation or Eutrophication? In *The Ecosystem Approach to Fisheries*, eds. G. Bianchi, and H. R. Skjoldal, 309–354. CAB International.
- Kooiman, J., M. Bavinck, S. Jentoft, and R. Pullin, eds. 2005. *Fish for Life: Interactive Governance for Fisheries*. Amsterdam: Amsterdam University Press.
- Kooiman, J. 2008. Exploring the Concept of Governability. *Journal of Comparative Policy Analysis* 10(2):171–190.
- Kraan, M. 2009. *Creating Space for Fishermen's Livelihoods. Anlo-Ewe Beach Seine Fishermen's Negotiations for Livelihood Space within Multiple Governance Structures in Ghana*. PhD thesis. Amsterdam: University of Amsterdam.

- Ligtvoet, W., P. J. Mouse, O. C. Mkumbo, Y. L. Budeba, P. C. Goudswaard, E. F. B. Katunzi, M. M. Temu, J. H. Wanink, and F. Witte. 1995. The Lake Victoria Fish Stocks and Fisheries. In *Fish Stocks and Fisheries of Lake Victoria. A Handbook for Field Observations*, eds. F. Witte, and W. L. T. van Densen, 11–53. Samara Publishing Limited.
- Lloyd, W. F. 1977. On the Checks to Population. Partly reprinted. In *Managing the Commons*, eds. G. Hardin, and J. Baden, 8–14. San Francisco: H. Freeman.
- LVFO. 2005. Regional Catch Assessment Survey Reports. Unpublished LVFO Technical reports.
- LVFO. 2009. Regional Status Report on Lake Victoria Bi-annual Frame Surveys Between 2000 and 2008. Kenya, Tanzania and Uganda.
- Macfadyen, G., and E. Corocoran. 2002. *Literature Review of Studies on Poverty in Fishing Communities and of Lessons Learned in Using the Sustainable Livelihoods Approaches in Poverty Alleviation Strategies and Projects*. FAO Fisheries Circular, No. 979, Rome: FAO.
- Menezes, A., R. Smardon, T. de Almeida. 2009. The Changing Dynamics of Local Institutions in Fishing Communities in Mozambique: Responses to Policy-Public Participation and Decision Making. *Environmental Practice* 11(1):32–49.
- Nickerson, V. 1985. *Telling Stories: Community History as a Tool for Natural Resource Managers*. Ann Arbor, MI: University of Michigan.
- Njiru, M., E. Waithaka, M. Muchiri, M. van Knaap, and I. G. Cowx. 2005. Exotic Introductions to the Fishery of Lake Victoria: What are the Management Options? *Lakes & Reservoirs: Research and Management* 10:147–155.
- Njiru, M., P. Nzungu, A. Getabu, E. Wakwabi, A. Othina, T. Jembe, and S. Wekesa. 2006. Are Fisheries Management Measures in Lake Victoria Successful? The Case of Nile Perch and Nile Tilapia Fishery. *African Journal of Ecology* 45:315–323.
- Odongkara, K., R. Abila, and P. Onyango. 2005. *Distribution of Economic Benefits from the Fisheries of Lake Victoria*. Entebbe, Uganda: Proceedings of the Lake Victoria Stakeholders' Conference, February 2005. 124–131.
- Onyango, P. O. 2000. Ownership: The management Foundation of a Sustainable Fisheries of Lake Victoria. *Proceedings of the Regional Stakeholders conference 24–25 February: The state of the fisheries resources of Lake Victoria and their management; concerns, challenges and opportunities*. EAC and LVFO, 340–347.
- Onyango, P. 2004. *Reforming Fisheries Management: A Case Study of Co-management in Lake Victoria, Tanzania*. Master thesis. Norwegian College of Fishery Science, University of Tromsø.
- Onyango, P. O. 2005. Socio-economics of Lake Victoria Fisheries. In *Synthesis Report on Fisheries Research and Management, Tanzania. Final Report*, ed. Y. D. Mgaya, 112–130. Lake Victoria Environmental Management Project.
- Onyango, P. O. 2009. Contribution of Lake Victoria Fisheries to Tanzania's Economic Growth, Poverty Status and Development. Country Report prepared for LVFO under the IFMP Project.

- Republic of Kenya, United Republic of Tanzania, Republic of Uganda. 1995. *Lake Victoria Environmental Management Project (LVEMP)*. Final Project Proposal document submitted to the World Bank.
- SEDAWOG. 2000a. The Co-management Survey: Results of the Survey of Fishers. In *The Co-management Survey: Co-managerial Perspectives for Lake Victoria's Fisheries*, eds. K. Geheb, and K. Crean, 48–61. *LVFRP Technical Document* No. 11 LVFRP/TECH/00/11. Jinja: The Socio-economic Data Working Group of the Lake Victoria Fisheries Research Project.
- Sen, A. 1981. *Poverty and Famines. An Essay on Entitlements and Deprivation*. Oxford: Clarendon Press.
- Sen, A. 1983. Development: Which Way Now? *The Economic Journal* 93(372): 745–762.
- Sen, A. 1989. Food and Freedom. *World Development* 17(6):769–781.
- Sen, A. 1999. *Development as Freedom*. New York: Anchor Books.
- Sen, A. 2009. *The Idea of Justice*. London: Penguin Books.
- Smith, L. E. D., S. Nguyen Khoa, and K. Lorenzen. 2005. Livelihood Functions of Inland Fisheries: Policy Implications in Developing Countries. *Water Policy* 7:359–383.
- Standing, A. 2008. Corruption and Industrial Fishing in Africa. Anti-Corruption Resource Centre at the Chr. Michelsen Institute Bergen U4 ISSUE 2008:7.
- Stobutzki, I. C., G. T. Silvestre, and L. R. Garces. 2006. Key Issues in Coastal Fisheries in South and Southeast Asia, Outcomes of a Regional Initiative. *Fisheries Research* 78:109–118.
- Thorpe, A., C. Reid, R. van Anrooy, and C. Brugere. 2004. African Poverty Reduction Strategy Programmes and the Fisheries Sector. Current Situation and Opportunities. *African Development Review* 16(2):328–362.
- Thorpe, A., N. L. Andrew, and E. H. Allison. 2007. Fisheries and Poverty Reduction. *CAB Review in Agriculture, Veterinary Science, Nutrition and Natural Resources*, 2. No. 085. <http://www.cababstractsplus/org/cabreviews>.
- United Republic of Tanzania (URT). 2005. National Guidelines for Beach Management Units BMU. Fisheries Division.
- Witte, B. S. F., J. H. Msuku, O. Wanink, E. F. Seehausen, B. Katunzi, P. C. Goudswaard, and T. Goldschmidt. 2000. Recovery of Cichlid Species in Lake Victoria: An Examination of Factors Leading to Differential Extinction. *Reviews in Fish Biology and Fisheries* 10:233–241.

Declaration according to Art. 6 (5) Promotionsordnung

Herewith, I declare that:

1. This work was compiled without any unauthorized help;
2. No materials or references other than those cited were used;
3. Those sections that are quoted or referenced from other pieces of work are clearly marked.

Bremen, 18.06.2012

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