

# Chapter 5

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

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**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.<sup>1</sup> 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.<sup>2</sup>

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,

<sup>1</sup>Daily Manabzamin (a Bengali Daily Newspaper) – 26 May 2009.

<sup>2</sup>The 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.<sup>3</sup> 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.<sup>4</sup> 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).

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<sup>3</sup>*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).

<sup>4</sup>The 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"> <li>• Dependency on single species (e.g., Hilsha, shrimp or prawn larvae)</li> <li>• Seasonality and fluctuation of natural resources</li> <li>• Extreme weather conditions e.g. cyclones, and coastal storms</li> <li>• Human-tiger conflicts</li> <li>• Piracy and other unlawful activities</li> <li>• Landlessness and settlement in areas exposed to coastal disasters</li> <li>• Death of bread-winners and female-headed households</li> <li>• Dowry</li> <li>• Lack of access in political processes and local institutions</li> <li>• Market vagaries and fishers' limited capacity to bargain</li> <li>• Lack of access to the formal credit system</li> </ul>	<ul style="list-style-type: none"> <li>• Fishing undersized species and using illegal fishing practice</li> <li>• Family bonding – by sharing responsibilities, and jointly contributing to the family income</li> <li>• Social networking – borrowing money and taking help from other fishers and relatives</li> <li>• Women's role in income generation</li> <li>• Patron–client relationship with money lender, extortion and protection money to pirates</li> <li>• Alternative activities outside of fisheries</li> <li>• Migration and remittance from abroad</li> </ul>

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

### 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 ratio<sup>5</sup> 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,

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<sup>5</sup>The 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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