The Role of Values and Beliefs in Small-scale Fishery and Dried Fish Production: An Exploration of Social Well-being in Fishing Communities of Sagar Island (Indian Sundarbans)

by

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is the true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

This research highlights the diverse values and beliefs associated with small-scale fisheries and dried fish productions and their role in strengthening social wellbeing of fishing communities. According to the Food and Agriculture Organization of the United Nations (FAO), small-scale fisheries are "firmly rooted in local communities, traditions and values". The strength in these local level values and beliefs determines the resilience of the fisheries system. However, several small-scale fisheries around the world are experiencing severe erosion in their long-held values and beliefs due to the adverse impacts from multiple drivers, e.g., globalization, commercialization, privatization, policy changes and climate change. In addition to the resulting vulnerabilities, this has led to systematic marginalization of these fishing communities who find it difficult to respond due to the weakening of their traditional values and beliefs as a source of strength and action. On this backdrop, this research presents an empirical investigation of the role of values and beliefs in small-scale fishery (SSF) and dried fish (DF) production by exploring their connections to the social wellbeing of fishing communities.

The purpose of this research is to examine the connections between 'values and beliefs' and 'social wellbeing' in fishing communities, with specific attention to the multiple drivers of change influencing those values and beliefs. Three specific objectives guide this research: (1) To identify the diverse values and beliefs and their meanings that are hidden in the SSF and DF production community groups; (2) To define the key drivers of values and beliefs and how they have affected the values and beliefs of the SSF and DF production community groups; and (3) To examine how the values and beliefs of the SSF and DF production community groups are connected to their social wellbeing (i.e., material, subjective, and relational wellbeing). The study was conducted in the fishing communities of Sagar Island, which is situated on the south-west edge of the Sundarbans region, India. The study used a largely qualitative and inductive methodology that combined secondary literature review with primary data collected through participant observations, semi-structured interviews (n=45), focus group discussions (n=33 people / 2 FGDs), and household surveys (n=45).

Major findings from this research indicate that, first, a growing number of life loss and economic loss experienced by community members dealing with small-scale fishery and dried fish production of Sagar Island have made them realize the need for ecosystem conservation. This

realization is stronger among those who are under the direct influence of ecosystem changes. The fishing community also acknowledged that failure in accepting and treating the extended primary group (outsiders) properly would lead to life-threatening conflicts (e.g., social disorder) and would erode the values related to social relationships (e.g., peacefulness, benevolence) eventually. It is this realization, in the backdrop of current economic uncertainties faced by SSF and DF production, have led its members to subordinate the potential religious or caste discriminations and built upon positives such as strong union and solidarity within community members. Second, the diverse challenges that existed in the Island (e.g., the vicious cycle of indebtedness to local moneylenders, depletion of fish stock after the emergence of fishing trawlers etc.) are forcing community members towards more of temporary migration in search of a more reliable livelihood option. This process weakens the traditional notion of local 'fishing community' and 'fisher family', erode values related to the place (e.g., attachment to place), and could gradually lead to complete human-environment disconnection in further stages. Third, for the majority of fishery households, the relationship between economy-related values (e.g., wealth) and social wellbeing is very strong as the majority of the time, they stay trapped in poverty. Furthermore, relationships among fishing members also influence access to material, and non-material benefits people derive from each other.

Ultimately, the results of this thesis indicated that the values and beliefs of a fishing community could provide valuable insights to achieve improved management of fisheries' resources. It can also help identify the present threat to small scale fisheries and dried fish production, and in turn will bolster the community's social wellbeing and their positive response to social-ecological changes.

Key Words:

Values, Beliefs, Small-scale Fishery, Dried Fish Production, Social Wellbeing, Social-ecological Regime Shifts, Drivers, Fishing Community, Sagar Island, Indian Sundarbans

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List of Acronyms

APFIC - Asia-Pacific Fishery Commission

CCVI - Climate Change Vulnerability Index

CMFRI - Central Marine Fisheries Research Institute

DF - Dried Fish

FAO - Food and Agriculture Organization of the United Nations

FGD - Focus Group Discussion

GPS - Global Positioning System

IMM - Integrated Marine Management

ISD - Indian Sundarbans Delta

MEA - Millennium Ecosystem Assessment

MGNREGA - Mahatma Gandhi National Rural Employment Guarantee Act

OBCs - Other Backward Castes

OECD - Organization for Economic Cooperation and Development

ORE - Office of Research Ethics

SBR - Sundarban Biosphere Reserve

SCs - Scheduled Castes

SES - Social-Ecological System

SSF - Small-Scale Fishery

STs - Scheduled Tribes

STR - Sundarbans Tiger Reserve

UNESCO - United Nations Educational, Scientific and Cultural Organization

USD - United States Dollar INR - Indian Rupee

WWF - World Wide Fund for Nature

CHAPTER 1
Introduction

India is developing rapidly, yet a large number of people involved in small-scale fishery (SSF) and dried fish (DF) production value chains are marginalized and continue to remain vulnerable to a variety of challenges and exploitation (Belton & Hossain, 2018). These challenges make the management and conservation of small-scale fisheries for livelihood benefits a significant global challenge (Birkeland, 2017; Bundy et al., 2016; Campbell et al., 2016; Lynch et al., 2016). While fundamental issues such as food insecurity and malnutrition continue to be major problems for those living in poverty (Black et al., 2013), research indicates that SSF and DF production contribute a large percentage of key micronutrients to the diets of the poor, and are important sources of livelihoods and employment opportunities (see Beveridge et al., 2013; Kawarazuka & Béné, 2010). However, there are serious concerns and threats about the stability and long-term viability of the SSF and DF production, which directly impacts the people whose livelihoods are highly dependent on these resources. According to the Food and Agriculture Organization of the United Nations (FAO), small-scale fisheries are "firmly rooted in local communities, traditions and values" (2015, p. v). Therefore, it is crucial to evaluate the values and beliefs of these people towards SSF and DF production that help contribute to their wellbeing.

Values and beliefs within social-ecological systems (SES) are a fundamental aspect of perception and cognition, which have largely been neglected within the social-ecological systems literature. Research on the values and beliefs associated with small-scale fisheries and dried fish productions can provide key insights into the social dimensions and can be drawn to improve upon environmental management initiatives (Jochum et al., 2014). Values represent the deeply held emotional aspects of people's cognition, and can complement the use of other cognitive constructs, such as knowledge and mental models (Jones et al., 2016). Schwartz (1994) defines values as "desirable goals, varying in importance that serve as guiding principles in people's lives" (p. 88). To put it differently, values serve as a guiding principle for selecting or evaluating behavior, people, and events. Values are abstract and could go beyond specific situations (they do not get affected by situations easily), and affect perceptions, beliefs and behaviors of different kinds. Fisheries are complex and multifaceted because of the involvement of a range of actors performing different tasks, each with different objectives, values, beliefs, preferences and capacities

(Coulthard et al., 2011). As a result, a multi-dimensional framework (Coulthard, 2012) is required to gain the complex and diverse views, aspirations and capabilities of fishing communities (Coulthard et al., 2011). The study will adopt a social wellbeing approach to advocate for both the tangible and intangible aspects of fisheries that have direct impacts on the livelihoods of fishing communities.

The social wellbeing approach is a multi-dimensional framework that involves more than fishers' income or expressed happiness. It also includes 'satisfaction with' and 'flourishing in' a way of life that is appreciated and believed valuable (Coulthard, 2012). According to White (2009b), wellbeing is a subjective evaluation of having a good life in the state of material welfare, but also the capability to live a good and meaningful life and experience happiness. The concept of wellbeing is not based on the model of any particular society, nor does it focus on any specific socio-cultural setting or geographical location. It rather frames different attributes such as set of needs, freedoms and quality of life that altogether contribute to wellbeing (Coulthard et al., 2011). A social wellbeing approach is ideally a comprehensive framework, and all the different dimensions are closely interlocked with each other (Britton & Coulthard, 2013). Many researchers have adopted the three-dimensional social wellbeing approach that entails subjective, objective or material and relational dimensions (see Britton & Coulthard, 2013; Coulthard, 2012; Coulthard et al., 2011). The material and relational aspects of wellbeing come mostly from specifically observed conditions and may not be entirely related to an individual's perception (Smith & Clay, 2010).

This research highlights the diverse values and beliefs associated with SSF and DF production systems in Sagar Island and how they are connected to the social wellbeing of fishing communities. Effective fisheries resource management of a place requires an understanding of values, beliefs, attitudes, expectations and needs in the targeted society to serve as technical guidance throughout the planning and decision-making process. Although fishery is considered the backbone of the Sundarbans economy, it faces some serious problems related to biodiversity, sustainability and livelihood (Chandra & Sagar, 2003). The topic of SSF and DF production in the Sundarbans has not received the research attention it deserves considering the vital contribution that it makes to nutrition, food security, sustainable livelihoods and poverty alleviation. The Sundarban region is a nursery grounds for the majority of the important commercial aquatic species of the eastern coast of India. It also acts as a buffer zone to millions of people living across

the coastline of India and Bangladesh, whose lives, properties and infrastructure are protected from extreme weather events by this barrier.

Small-scale fishing communities often face many challenges worldwide, including globalization (e.g., encroachment from other industries such as industrial fishing), marginalization, and climate change (e.g., sea-level rise, increasing sea surface temperatures) (FAO, 2014; Nayak et al., 2014; Wilkinson & Salvat, 2012). The Indian Sundarbans population in many ways faces additional problems because of poor communication resulting from the innumerable creeks, canals and tidal rivers, which separate the islands from each other and from the mainland (Molla et al., 2009). Other than this, the resources in the Sundarbans are fast reaching the stage of overexploitation which can be very detrimental for the sustainability of the existing livelihoods.

Gender discrimination is another challenge that is common throughout the Indian Sundarbans. Women's lives in the region are shaped by the patriarchal and patrilineal society. In spite of holding dual responsibilities both in and out of households to secure food and livelihood, women have almost no control over income and assets and are being subjected to subordinate social position. For women engaged in SSF and DF production, the problems are compounded by extreme poverty, poor housing, limited access to health, sanitation and safe drinking water, and low literacy (Roy et al., 2017). Molla et al. (2009) found that more than 50 per cent of female fishers in the Sundarbans belong to families living in abject poverty, while about 87 per cent of those involved in DF production are illiterate (Roy et al., 2017). Further, the income they make is hardly enough for the subsistence of their families. These above-mentioned realities are crucial because they affect access and control over resources and define how women can participate in fisheries activities.

1.1 Research Goal and Objectives

This research assesses the linkages between 'values and beliefs' and 'social wellbeing' in small-scale fishing communities and analyzes how multiple drivers of change impact these values and beliefs. The research objectives of this thesis are to:

1) Identify the diverse values and beliefs and their meanings that are hidden in the small-scale fishery (SSF) and dried fish (DF) production community groups;

2) Define the key drivers of values and beliefs and how they have affected the values and beliefs of community groups; and

3) Examine how the values and beliefs of community groups are connected to their social wellbeing (i.e., material, subjective, and relational wellbeing).

The connection between values and wellbeing is not arbitrary, as the two concepts are deeply and inextricably related (Deneulin & McGregor, 2010). Small-scale fisheries are often vulnerable because fishers/dried fish producers associated with it are geographically isolated, economically deprived, politically voiceless, and are considered culturally low class (Islam, 2011; Rahman et al., 2002). Contrary to this vulnerability, fisheries are more a 'way of life' (Gatewood & McCay, 1988; Onyango, 2011) as they offer life-defining social and cultural values to the people involved (Johnson et al., 2018). It is for this reason that many fishers choose to stay in fishing despite the livelihood uncertainty and the life risks involved in it (Pollnac & Poggie, 2008; Pollnac et al., 2001). The other point to consider is that the pursuit of a good life, or living well, is directly connected to one's particular values. Therefore, we can conclude that the ability to live well relies heavily upon one's socially-recognized capability to achieve something which is valued (Johnson et al., 2018). Capturing diverse values and beliefs hidden in small-scale fisheries and understanding their linkages with the social wellbeing of fishing communities is essential not only for improving the fisheries resource management, but also for securing sustainable livelihoods of fishing communities.

1.2 Literature Review

The literature review is conducted to obtain a conceptual and theoretical understanding of previous research on the three areas of interest, namely: values and beliefs, community wellbeing, and drivers of values and beliefs in a social-ecological system. It provides a theoretical baseline for me as a researcher to systematically search, critique and combine the literature to demonstrate a gap in the existing research base, and understand both the research and the methods previously used to investigate the three main areas. The literature review is conducted with the help of Mendeley reference management software in which the bibliographic data of research materials was generated and organized in broad categories. The categories include SSF and DF production, values and beliefs, social-ecological changes, wellbeing, methodology, study area, gender, and official reports. The same software program was also used to generate list of references.

1.3 Study Area and Research Methodology

The case study for this research is Sagar Island, an island on the south-west edge of the Sundarban region, India (Figure 1.1). Due to its geographical location, the island is extremely exposed to coastal flooding, storm surges and cyclones, leading to high rates of erosion and salinization (Ghosh et al., 2014). The Sundarbans delta provides a physiologically suitable environment with respect to temperature, salinity and other physio-chemical parameters. Therefore, the Sundarbans has been the nursery grounds for nearly 90% of the important commercial aquatic species of eastern coast of India (Chandra & Sagar, 2003). After agriculture, fishing is the most common means of livelihood in the Sundarbans (Danda, 2010) for over 4.4 million people residing in this region (Census of India, 2011). The total estimated number of households in the Sundarbans that list 'fishing' as one of the family occupations is 11% of the households inhabiting the area (Sánchez-Triana et al., 2014). This percentage goes up to 60-70% in areas with easy access to rivers (Sen, 2019).

Although fishery is treated as the backbone of the Sundarbans economy, it faces some serious problems in the form of climate change-related weather events and sea-level rise. Lack of infrastructure facilities and natural calamities such as cyclonic storms are the most critical drivers of out-migration, food insecurity and poverty in the Indian Sundarbans (O'Donnell, 2015). Another strategic and economic importance of the Sundarban area is derived from the Gangasagar pilgrimage, which is the second-largest congregation of humankind and takes place in Sagar Island - the meeting point of the Ganges river and the Bay of Bengal.

This research follows a largely inductive and qualitative approach, justified for its rigor to describe the complex human perceptions and interactions (Anderson, 2010), which is the objective of this study. Achievement of the research objectives entails primary data collection in the form of different methods, including participant observations, semi-structured interviews (45 interviews: 25 males and 20 females), focus group discussions (2 focus group discussions with a total of 33 people), and household surveys (45 surveys: 25 males and 20 females) to be carried out in the study area itself.

During the initial data collection stage, the researcher was involved in several informal engagements and participant observations to gain a foundational understanding of community and cultural dynamics and to build social capital. Semi-structured interviews were preferred over structured and unstructured interviews because this method provides a balance of structure and the

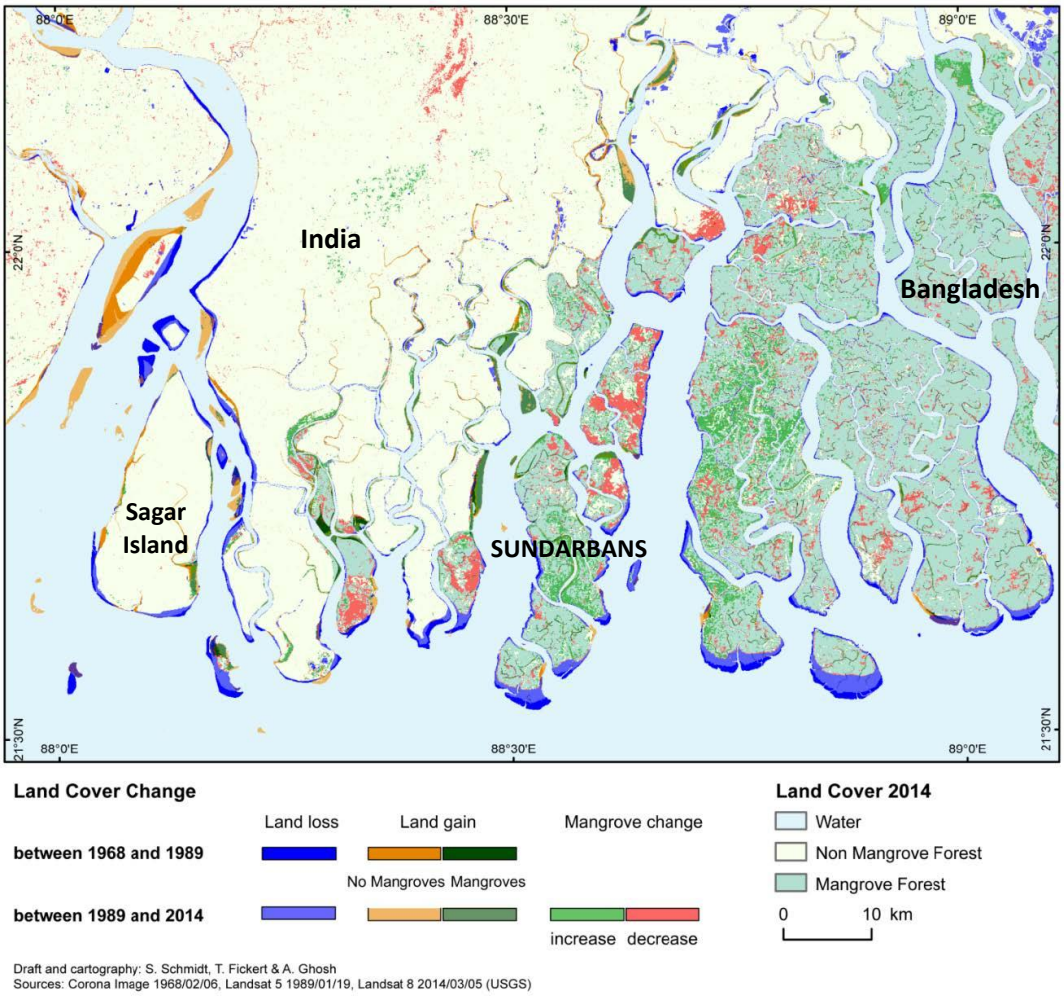


Figure 1.1 Case study - Sagar Island is located on the south-west edge of the Indian Sundarbans. Change detection analyses indicating areas of land loss and land gain between 1968 and 2014. *Note.* Adapted from Ghosh et al. (2015).

freedom to explore emerging themes by using a series of predetermined but open-ended questions. They are conducted as a verbal exchange between the interviewer and the interviewee, unfolding in an informal and conversational manner. Using preliminary data garnered from semi-structured interviews, focus groups participants shared knowledge that made it easier for the researcher to identify the linkages between the values and beliefs, social wellbeing, and drivers of values and beliefs. Moreover, the discussions created a ground for participants to share their concerns and suggestions to the current community problems. During the semi-structured interviews, a rapid household survey was undertaken with the same respondents by employing a questionnaire to identify emerging trends and themes.

Results were analyzed using a descriptive research design, chosen due to its ability to

systematically describe the facts and characteristics of persons, and discover associations or relationships between the selected variables which include values and beliefs, key drivers, facets of social wellbeing, and gender (Dulock, 1993). The data goes under a thematic analysis using qualitative coding with the help of NVivo qualitative data analysis computer software. The literature review was a continuing component throughout the research, and fieldwork occurred throughout September 2019.

1.4 Thesis Organization

This thesis presents an empirical investigation of the diverse values and beliefs hidden in the small-scale fishery and dried fish production of Sagar Island by focusing on their connections with the social wellbeing of the fishing community. Chapter one opens the thesis by introducing its theoretical background, the study's objectives, and significance of the issues it is trying to address. The chapter also provides a brief overview of the study area, research design and methodology part. In Chapter Two, a review of relevant literature (i.e., small-scale fisheries and dried fish productions, values and beliefs, social wellbeing) is provided and the conceptual framework that shapes this research is concluded at the end. In Chapter 3, the case study context is expanded, and the methodological approach and methods used to obtain information and conduct the research has been outlined. Next, in Chapter four, five and six, the key findings on values and beliefs of fishing communities, key drivers of values and beliefs and social wellbeing status of fishing members have been provided. Lastly, Chapter seven concludes the thesis by highlighting the key findings, discussions, and areas for future potential research.

CHAPTER 2
Literature Review

2.1 Introduction

In spite of the existing vital importance of values and beliefs in SSF and DF production, they are almost invisible in research and policy-makings. The literature review is conducted to obtain a conceptual and theoretical understanding of previous research on the three areas of interest (i.e., values and beliefs; community wellbeing; drivers of values and beliefs in a social-ecological system) and find linkages between them. It also demonstrates a gap in the existing research base and the methods previously used in similar research areas. This chapter is a synthesis of the relevant histories, definitions, challenges, and critiques associated with the central concepts of this research: (1) small-scale fisheries and dried fish productions (Sec 2.2); (2) values and beliefs (Sec 2.3); and (3) social wellbeing (Sec 2.4). In the following sections, I provide a summary of the literature related to these concepts and conclude the chapter by introducing the conceptual framework of this research (Sec 2.5).

2.2 Small-scale Fisheries and Dried Fish Productions

Small-scale fishery is generally characterized as a dynamic and evolving sector employing labor intensive harvesting, processing and distribution technologies to exploit marine and inland water fishery resources (FAO, 2004). Although the activities of this sub-sector can be conducted full-time, the prevalence of part-time or just seasonal employment is more in practice (FAO, 2004, 2008). The employment peaks in the months of the year when fishery resources are more abundant or available in coastal and offshore areas but shifts to other occupations during the off-season (FAO, 2008). FAO (2008) has reported that in the past three decades, the number of full-time fishers has declined while the number of part-time fishers has grown quite rapidly, especially in Asia. Therefore, a large number of fishing communities may pursue mixed livelihood strategies, of which fisheries may comprise only one component (FAO, 2008, Kurien, 2005; World Bank, 2004).

Small-scale fishers operate at various organizational levels ranging from self-employed single operator basis to formal sector businesses. Therefore, this sub-sector is not homogenous within and across countries and attention to this fact is necessary while formulating strategies and

policies for enhancing its contribution to food security and poverty alleviation (FAO, 2004). The activities conducted in small-scale fisheries are often targeted on supplying fish and fishery products to local and domestic markets, and for subsistence consumption of the local residents (FAO, 2004). Moreover, fish (often referred as 'rich food for poor people') makes a vital contribution to the survival and health of a significant portion of the world's population in both the developing and developed world because of its high nutritional value (APFIC, 2010).

A large share of fisheries' catches landed in developing countries such as India is preserved using simple techniques including sun drying, salting, fermentation, and smoking (these products collectively referred as 'dried fish' in this research). Much of the catch is dried, as facilities for freezing and transporting frozen fish remain poorly developed, particularly as many fish landing sites are in remote locations (as in the case study of this research). Drying results in dehydration, weight reduction and concentration of nutrients, and make dried fish easy to store and transport. It is interesting to note that the nutritional quality of dried fish remains unchanged, and sometimes even retains higher quality standards compared to fresh fish (Faruque et al., 2012). The high nutritional quality of dried fish, their typically low prices, and their ready divisibility into small portions make them widely and readily available and accessible, and of great importance to the nutrition of the most vulnerable people. For instance, in India, consumption of dried fish is about 32% of the total marine landings, and about 17% of the total catch are used to produce dried fish (Goswami et al., 2002). In West Bengal state of India (the state of the case study of this research), about 78% of total fish catch is consumed in fresh condition, 6% is used as dried fish and rest is used as frozen fish (MPEDA, 2014).

Despite the importance of the small-scale fisheries sector to food security, livelihood generation and income, poverty in coastal areas has always been prevalent when it comes to countries such as India, Bangladesh, Indonesia, Myanmar, Pakistan, Philippines and Viet Nam (APFIC, 2010). Income generated by the fisheries sector is generally lower than those from other sectors and within the sector itself, small-scale fishers earn the lowest incomes (Silvestre et al., 2003). Thus, fishing people are often labelled 'the poorest of the poor' (APFIC, 2010). Many settlements of fishing communities are temporary and unofficial and do not benefit from state-delivered services such as health and education. The vulnerability towards natural hazards (such as floods, storms and cyclones) is also high among them, due to physical exposure and livelihood dependency. Moreover, the weak political power of this sector makes them more vulnerable to

threats, and perhaps the greatest external threat facing them is the large-scale fishing sector (McGoodwin, 2001). Low access to main markets (due to various institutional and non-institutional barriers such as high transportation cost), credit and the perception that small-scale fishers make unreliable borrowers further reduces opportunities for this group, thereby pushing them further towards poverty (FAO, 2008).

When it comes to DF production in which women dominate the workforce, there are additional serious concerns that have been raised. First, the ecological integrity of the fisheries on which DF production is based is threatened, resulting in fish shortages and price shocks (Khan et al., 2002) Second, many laborers belong to marginalized groups (widows, refugees, religious minorities, and lower castes, for example) and are vulnerable to a variety of forms of exploitation and exposure to health and personal safety risks due to their poor working conditions (Belton et al., 2018). Third, utilization of dried fish for production of feeds for a growing aquaculture and livestock industry may divert fish away from human food chains (Funge-Smith et al., 2005).

2.2.1 Social Contributions of Small-scale Fisheries and Dried Fish Productions

It is important not to reduce small-scale fisheries to mere economic activity. One of the important attributes of the small-scale fishery is that fishing is an intrinsic part of fishers' personal and cultural identities. Among the majority of small-scale fishers, fishing is perceived not only a means of assuring one's livelihood but also as a 'way of life' which is vivified by important occupational values and symbols. It is these values and symbols that underline the core aspects of small-scale fishers' individual and cultural identities (McGoodwin, 2001). Many small-scale fishers are therefore very determined in their attachment to their occupation even after it has ceased to be economically viable. And this perseverance can sometimes make them unreasonably resistant to necessary and progressive change, which in turn can pose further problems for fisheries management (McGoodwin, 2001).

Human beings have evolved mainly in terrestrial environments; therefore, marine environments pose special challenges for sustaining human life, requiring the development of special social, cultural, economic, and technological adaptations (McGoodwin, 2001). As a result, the practical and necessary adaptations of small-scale fishing communities to the marine ecosystems they exploit are often evident in different components of their cultures, including components which are more distant from fisheries technologies and fisheries activities. Therefore,

even where most of a fishing community's religious beliefs and practices derive from the larger culture of which it is a part, it may still borrow few unique beliefs and traditions from its exploitation of particular marine ecosystems and marine species (McGoodwin, 2001).

There is usually a profound pride in occupational identity among the members of small-scale fishing communities who fish at sea because of their high devotion to the fishing way of life. Fishing at sea necessitates high degrees of independence, self-reliance, autonomy, risk-taking, and outdoor work challenging nature, and as they are important cultural characteristics of the fishing occupation, they are also undoubtedly important characteristics of individual fishers (McGoodwin, 2001). Moreover, fishing occupation confers 'satisfaction' to its practitioners in addition to other important markers such as self-identity and individual pride. Therefore, for a small-scale fisher who chooses to work at sea year after year, fishing could be regarded not merely as a means of ensuring livelihood, but also a rewarding and meaningful way to spend one's life (McGoodwin, 2001).

Small-scale fishers can play a tremendous role in improving the life of coastal communities through the foregoing mechanism of collective actions, shared cultural identity, sense of common social norms, etc. Although these are fewer tangible factors in comparison to a direct increase in household income, they can leave remarkable impacts in terms of empowerment, well-being and collective and individual self-esteem (Béné, 2006). Hence, effective and appropriate fishery management practices and policies are well served by understanding the importance of the social characteristics in small-scale fishing communities (McGoodwin, 2001). It is also worth stressing that while there is a strong sense for supporting values and social norms held by fishing communities, there is also need for protecting the rights of groups that may be marginalized or discriminated by existing values and norms. For example, in some traditional fishing communities, the existing values (which are predominantly patriarchal in nature) keep women out of public spaces or decision-making processes (Sharma, 2011).

Likewise, for DF production focusing merely on financial aspects may led to undermining of broader values (Fabinyi et al., 2018). In addition to financial values, dried fish producers may attach socio-cultural values and associated meanings to their practice (Appadurai, 1986). For instance, their cultural identities, kinships, way of life, and autonomy could be highly dependent on their ability to continue fish drying-based livelihoods (Johnson, 2018).

2.2.2 Gender as a Cross-cutting Theme

In the majority of the world's small-scale fishing communities, men are mostly engaged in fishing and women are supposed to perform dual roles: first, as the mainstays of their households and children; and second as an entrepreneur and an active hand during the pre and post fishing phase (FAO, 2004, 2008; McGoodwin, 2001). The pre-fishing phase includes "making and mending nets, baskets and pots and baiting hooks" (FAO, 2008). Post fishing phase, on the other hand, includes "fishing from small boats and canoes in coastal or inland waters - harvesting bivalves, molluscs and pearls, collecting seaweed and setting nets or traps" (FAO, 2008). Labor 'post-fishing' is the most common among women as they tend to work as wage laborers in fish processing and marketing (FAO, 2008).

Small-scale fisheries have been described as providing livelihood options for women to improve their control over (part of) their household income (Kawarazuka & Béné, 2010). In the gender and development related literature, the role and economic status of women are identified as key determinants of the food security and nutritional status a household enjoy (Quisumbing et al., 1995; Smith et al., 2003). In particular, a large body of evidence suggests that the higher the degree of control and independence exercised by women over the family income, the higher the proportion of income would be spent on food (Hopkins et al., 1994; Kennedy & Peters, 1992; Shaikh, 2007).

The multiple roles that women usually play in small-scale fishing communities underline their fundamental importance in their communities' social and economic structures, and in particular, their high importance in sustaining their communities' overall wellbeing (McGoodwin, 2001). Because women who are involved in fisheries activities are securing a position of prominence in small-scale fishing communities, they usually enjoy more independence, economic autonomy, and ramified local socioeconomic networks in comparison to their non-active female counterparts (McGoodwin, 2001). Further, their participation and satisfactory earnings may lead to sense of belongingness as they work alongside same gender with similar issues to share (widowed/abandoned, lower castes, refugees, and impoverished) (Belton et al., 2018). It is crucial to recognize that gender differences within the sector are often a reflection of broader societal issues (Béné et al., 2007), making the need to incorporate relevant cross-sectoral considerations and to recognize the importance of prevailing cultural environment into the policy-making process (APFIC, 2010).

Given the socio-economic and cultural similarities of India and Bangladesh, the percentage of women in DF production in India is comparable with Bangladesh where women account for about 50% of the workforce in SSF and 60% of the workforce in DF production (Belton et al., 2018). A significant portion of these women experience frequent discrimination based on their gender, caste, culture, ethnic origin, and religion. One of the most common challenges is unequal pay where female workers are paid significantly lower rates than their male counterparts (Belton et al., 2018). The fisheries activities that women perform tend to be considered part of their household duties and end up as under-paid/un-paid labor.

2.3 Values and Beliefs

Generally speaking, values have been discussed in a number of different ways in a broad range of disciplines, such as philosophy, psychology, sociology, anthropology, ecological economics, and resource management. Because 'value' can be a baffling concept whose meanings may vary depending on one's disciplinary frame, an introduction of the values is first presented in order to illustrate how the concept has been approached for the present research.

2.3.1 The Concept of Values and Beliefs

'Values' are enduring conceptions of what human beings see as preferable and which influences their choice and action (Brown, 1984). They are assumed to affect an individual's belief and behavior in various ways. According to the Oxford dictionary online, values are "the principles or standards of behavior; one's judgment of what is important in life." On the other hand, beliefs are more specific than are values, as they typically refer to specific domains of life (Collins et al., 2007). Fishbein and Ajzen (1975) define beliefs as statements indicating a person's subjective probability that an object has one or more attributes. For example, one may have beliefs about the role of stakeholders in fisheries management, about one's own behavior, or about the behavior of a government. Compared to values that are more deep-rooted and resistant to change (Burch & Deluca, 1984), beliefs may be more easily changed in the presence of new and contradictory information or life experiences - for example, fads and fashions in political and social thinking or the influence of a new social circle may change the existing beliefs (Collins et al., 2007).

The most common types of values used throughout researches in social science are associated with the work by Shalom Schwartz on 'universal' human values (see Schwartz, 1992,

1994). Schwartz defines values as “desirable goals, varying in importance, that serve as guiding principles in people’s lives” (1994, p. 88). Schwartz (1990, 1992) has developed one of the most widely used values inventory comprising 57 items. The dedicated researches suggest that of these 57 human values, 46 values can be grouped into two dimensions: self-transcendence (e.g., protecting the environment) versus self-enhancement (e.g., social power), and openness to change (e.g., freedom) versus conservatism (e.g., self-discipline). Further, they identify ten-value clusters that help describe individual differences in values: universalism, benevolence, conformity, tradition, security, power, achievement, stimulation, hedonism, and self- direction (Table 2.1). The first four value clusters refer to social values, while the other six clusters reflect individualistic values. The remaining 11 values out of the 57 are for use in cross-cultural studies and are not used in studies of individual behavior within a single culture.

Some researches like Song et al. (2013) and Song and Chuenpagdee (2015) have adapted and modified values schemes introduced in Schwartz (1990, 1992, 1994) to compile a value inventory specific for fisheries governance context. They further, categorized these thematic value types into four broader categories according to the cluster of important human virtues, namely: better world, good life, personal virtues, and outward aspirations, which are further explained in Chapter 4. Throughout this research, the value scheme suggested by Song and Chuenpagdee (2015) and Song et al. (2013) has been used as the reference which reveals what values mean among fishing communities.

Table 2.1. An overview of forty-six individual-level thematic value types (in bullets) identified by Schwartz, which consists of ten value clusters (*italics*) across four main axes (Self-transcendence, Self-enhancement, Openness, Conservatism), and their motivational defining goals

Main axes	Self-transcendence	Self-enhancement	Openness	Conservatism
Value clusters	*Universalism*	*Power*	*Self-direction*	*Tradition*
Motivational defining goals	Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.	Social status and prestige, control or dominance over people and resources.	Independent thought and action-choosing, creating, exploring.	Respect, commitment, and acceptance of the customs and ideas that one's culture or religion provides.
Thematic value types	▪ Protecting the environment ▪ A world of beauty ▪ Unity with nature ▪ Broad-minded ▪ Social justice ▪ Wisdom ▪ Equality ▪ A world at peace ▪ Inner harmony	▪ Social power ▪ Authority ▪ Wealth ▪ Preserving my public image ▪ Social recognition	▪ Creativity ▪ Curious ▪ Freedom ▪ Choosing own goals ▪ Independent	▪ Devout ▪ Respect for tradition ▪ Humble ▪ Moderate ▪ Accepting portion in life ▪ Detachment
Value clusters	*Benevolence*	*Achievement*	*Stimulation*	*Conformity*
Motivational defining goal	Preserving and enhancing the welfare of those with whom one is in frequent personal contact (the 'in-group').	Personal success through demonstrating competence according to social standards.	Excitement, novelty, and challenge in life.	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.
Thematic value types	▪ Helpful ▪ Honest ▪ Forgiving ▪ Loyal ▪ Responsible ▪ True friendship ▪ A spiritual life ▪ Mature love ▪ Meaning in life ▪ Healthy	▪ Successful ▪ Capable ▪ Ambitious ▪ Influential ▪ Intelligent ▪ Self-respect	▪ Daring ▪ A varied life ▪ An exciting life	▪ Politeness ▪ Honoring parents and elders ▪ Obedient ▪ Self-discipline
Value clusters			*Hedonism*	*Security*
Motivational defining goal			Pleasure or sensuous gratification for oneself.	Safety, harmony, and stability of society, of relationships, and of self.
Thematic value types			▪ Pleasure ▪ Enjoying life	▪ Clean ▪ National security ▪ Social order ▪ Family security ▪ Sense of belonging ▪ Reciprocation of favors

Note. Adapted from Schwartz (1992); Schwartz (1994); Schwartz & Bilsky (1987).

According to Schwartz (1992), the abovementioned value types form a circular structure (Figure 2.1) to define the commonalities and conflicts among them. While the adjacent value types are in congruence, values on the respective opposite side of the circle are in conflict. To give an example, Self-Direction values (e.g., freedom) can serve to permit excitement (Stimulation) or to discover and understand people who are different from oneself (Universalism). On the contrary, it causes social conflicts to give a family the first priority (Tradition).

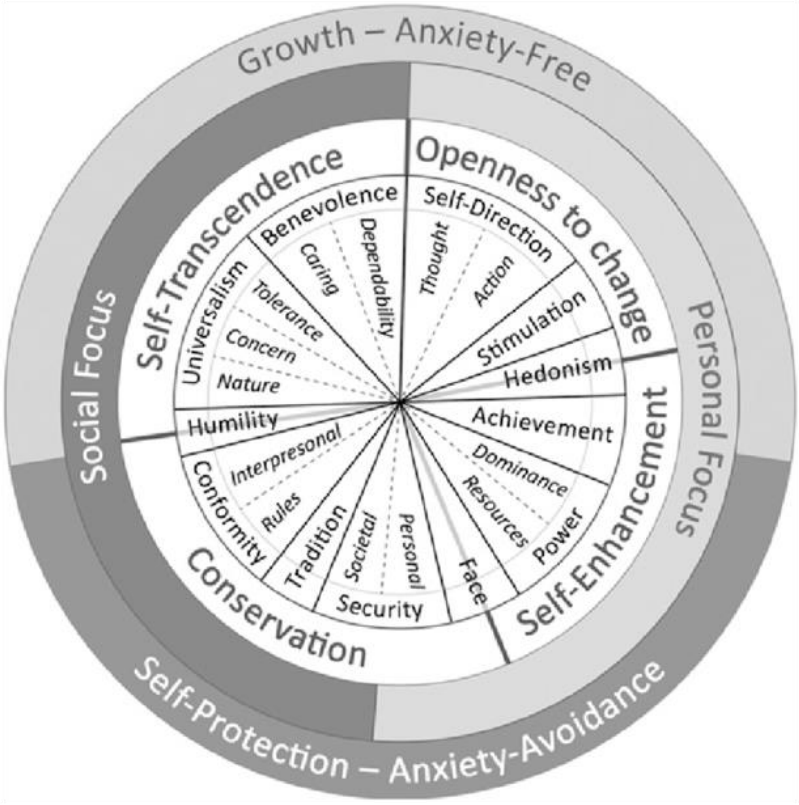


Figure 2.1 Prototypical model of Schwartz's value structure at the individual levels. *Note.* Adapted from Schwartz (1992, 2006). The labels of the diagonal axes were added - Growth vs Protection and Personal vs Social Focus (Fontaine et al., 2008).

2.3.2 Role of Values and Beliefs in Governance of Small-scale Fisheries

A common finding in studies on relationships between values and behaviors (e.g., Karp, 1996; Schultz & Zelezny, 1999; Stern et al., 1999) is that the engagement in environmentally and socially responsible behaviors is more likely in individuals who hold collective, society-directed values than those who hold individualist, self-directed values. For example, Schultz and Zelezny (1999) highlight that those, who strongly value all humans, animals, and the environment are likely to behave pro-environmentally ["behavior that consciously seeks to minimize the negative impact of

one's actions on the natural and built world" (Kollmuss & Agyeman, 2002, p. 240)], as doing so benefits the things they value (e.g., universalism). Those motivated by power are likely to regard the environment as less important than their own personal advancement and convenience (e.g., power and tradition). Therefore, underlying values have become the most central feature of understanding society for researchers as they hold values responsible for shaping and justifying the particular beliefs, attitudes, goals, and actions of individuals and groups (Rokeach, 1968).

Shealy (2016) states that "beliefs and values are at the very heart of why we humans do what we do - and who we say we are - to ourselves, others, and the world at large" (p. 3). Yet, values are not the only predictors of behavior as similar behavior may have different determinants. Indeed, value orientations in combination with capabilities do yield insights into the underlying motivations for particular choices and behavior (de Vries & Petersen, 2009). It is crucial to be aware that rural livelihood of a particular community comprises numerous capabilities and assets that are defined by the local cultural and historical contexts of that region. People's values, customs and traditional knowledge systems offer alternatives/adaptive strategies to strengthen livelihood assets and generate new opportunities during vulnerabilities caused by social-ecological regime shifts (Daskon, 2010). These values are crucial in recovering rural communities from vulnerability situations by enabling them to adapt through the use of traditional skills and knowledge passed from generation to generation (Daskon & Binns, 2010). Sadly, these potentials and strategies of rural communities, which are also vital to the sustainability of rural livelihood systems, often stay hidden and therefore are ignored at the policy level (Daskon, 2010).

It is expected from natural resource governance to respond effectively and timely to dynamic environmental conditions in a manner that addresses the social and political complexity of the system it aims to govern (Song et al., 2013). What makes governance of natural resource sectors such as fisheries among the most challenging ones to govern is the complexity, dynamics and multi-scale interactions between humans and the environment (Cochrane, 2000; Ludwig et al., 1993; Pauly et al., 2002). Well-implemented conventional and popular policy initiatives often remain ineffective and produce disappointing results (see Pitcher & Lam, 2010 for examples). During the past few years, some researchers have characterized resource governance issues as 'wicked problems' (Berkes, 2012; Jentoft & Chuenpagdee, 2009; Khan & Neis, 2010; Ludwig, 2001; Onyango & Jentoft, 2010) because the cases have shown that defining a problem itself is a problem, and the problems are never solved, but re-solved in the intervening period. This

complexity derives from the inherent nature of social problems, especially the ones in which various groups of individuals (resource users and governing actors) with their own set of values, behaviors, decision, needs, judgments and worldviews are involved (Jentoft & Chuenpagdee, 2009; Ludwig et al., 2001; Rittel & Webber, 1973). As a result, these elements should be investigated well as they have indefinite form; and meanings may be incommensurable, competing, and incompatible, and they often go unnoticed in policy and decision-making process (Song et al., 2013).

2.4 Social Wellbeing

The primacy of wellbeing-focused initiatives has increased steadily across governments, NGOs, and academic sectors during the past decades (Barrington-Leigh & Escande, 2018). A notably sharp rise of interest in wellbeing occurred during the mid-2000s (Barrington-Leigh & Escande, 2018), coinciding with the publication of the MEA (Millennium Ecosystem Assessment) in 2005. The MEA (2005) examined human wellbeing by considering its structure based on basic material needed for a good life, health, good social relations, security, and freedom of choice and action. 'Social wellbeing' has emerged as one distinct interpretation of wellbeing approach, summarized by three dimensions: material (e.g., resources, income, assets), relational (e.g., access to markets, institutions, social capital), and subjective (e.g., self-identity, aspirations, happiness) (Figure 2.2) (White, 2009a, 2009b). The arrows shown in the figure suggest the inter-relationship and co-constitution of the various dimensions of wellbeing (White, 2009a). This analytical structure in the social wellbeing approach is latent in its definition of wellbeing (McGregor, 2008): "A state

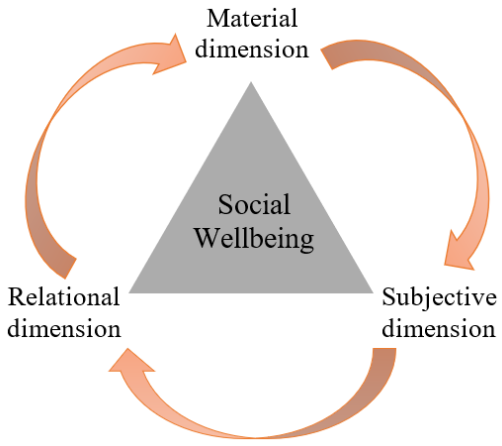


Figure 2.2 Visualization of the three dimensions of social wellbeing. *Note*. Adapted from White (2009b).

of being with others and the natural environment that arises where human needs are met, where individuals and groups can act meaningfully to pursue their goals, and where they are satisfied with their way of life" (Armitage et al., 2012, p. 3; Breslow et al., 2016, p. 2).

2.4.1 Social Wellbeing in Small-scale Fishing Communities

The "wellbeing of communities is…an essential precondition for the wellbeing of individuals" (Wiseman & Brasher, 2008, p. 355). This statement finds support in the 2016 report of the Organization for Economic Cooperation and Development (OECD) which states, "people's happiness depends to a large extent on the circumstances of the broader community they are part of and their relationship to it" (OECD, 2006, p. 34). The epitome of wellbeing in a community is one in which "the needs, values, and norms of different community segments" (McCrea et al., 2014) are met. Therefore, promotion of community wellbeing can play a significant role in improving the mental and emotional wellbeing of individuals.

Coulthard (2012) suggests that the social wellbeing lens may offer a means for in-depth social impact assessments. When a wellbeing lens is applied to the context of small-scale fishing communities, it captures certain outcomes beneficial to fishers, including material goals like economic yield, food source and employment; and non-material goals such as work safety, equitable working conditions; or the preservation of ecological values in their marine and coastal environments (Allison et al., 2012; Coulthard et al., 2011). The application of a wellbeing lens, encompassing all three dimensions, facilitates a better understanding of the multifaceted reality that fishing communities live in. It provides an analysis of both the improvements and trade-offs that fishers experience and can contribute to governance approaches by providing the basis for fishery management measures. Previously available fisheries literature placed a large emphasis on a narrow single objective viewpoint of wellbeing (see Anderson, 1987 as an example). This perspective confines individual and community wellbeing in fisheries context solely to monetary constituents, without giving due consideration to the intangible relational and subjective dimensions of wellbeing. As fisheries are multi-scaled and involve a multitude of objectives, all three dimensions (material, relational and subjective) should, therefore, be equally considered in governance-related decision-making.

The material dimension of wellbeing is concerned with the resources a community has and the degree to which they meet the community's needs. It also encompasses practical welfare and

standards of living (for example, income, wealth, assets, environmental quality, physical health and livelihood concerns, among others). In academic circles, small-scale fisheries remain understated worldwide because the majority of researches are often guilty of evaluating them just in the terms of material dimension, and not the other dimensions (i.e., relational and subjective) which are existed in the sector and are equally important as material dimension. Indeed, social wellbeing framework could help the researchers and policy makers to better understand the challenges that fishing communities face by recognizing its objective, relational, and subjective components in an integrated way.

The relational dimension of wellbeing is being rooted in how rich a community's social capital is, which allows individuals to steer themselves within their community's social hierarchy and enter social networks. Social capital is defined by Weeratunge et al. (2014) as, "features of social organizations, such as networks, norms and trust that facilitate action and cooperation for mutual benefit" (p. 266). Having a diversity of social relationships for "dependency, obligation, support, reciprocity…and collective action in fishing communities can determine both a persons' wellbeing outcomes and fisher behavior" (Coulthard, 2012, p. 361). The relational dimension also highlights that what we value in our environment materially (material wellbeing) and how we perceive how we are doing (subjective wellbeing) depends on our relationships with others and with ideas that frame our social relations (Coulthard et al., 2011; Deneulin & McGregor, 2010; White & Ellison, 2007).

The subjective dimension of wellbeing relates to the importance of perceiving fishing as a 'way of life' and job satisfaction of fishers (Allison et al., 2012). A core concept of this dimension of wellbeing is identity, embodied as one's fears, hopes and aspirations (Weeratunge et al., 2014). Many fishers associate their occupation with their identity, taking great pride and high devotion to the fishing way of life. McGoodwin (2001) states that "the fishing occupation often confers not only important markers of self-identity and individual pride among fishers but a 'satisfaction bonus', which could not be measured on economic grounds alone" (p. 14). Most fishers perceive fishing, not only as a means to accrue income but also as an "intrinsically rewarding activity in its own right - a desirable and meaningful way of spending one's life" (McGoodwin, 2001, p. 14). The fishery is seen as a means of self-actualization, with strong occupational attachment driven by adventure and challenge. In most coastal communities like Sagar Island (study area of this research), fishing is an interwoven component of society, highly influencing cultural, economic

and political facets. Further, what is required is an approach that highlights an almost quantifiable assessment of positives that small-scale fisheries have to offer globally (Pauly, 2006; Thomson, 1980). The social wellbeing approach frames such analysis, as its theory meets these criteria because it is interested in it the diverse and multi-dimensional needs and aspirations that characterize what it is to live well for particular people in particular times and places (Agarwala et al., 2014).

2.4.2 Social Wellbeing Indicators

Wellbeing literature offers a multitude of indicators with which to measure and quantify the state of an individual's and community's wellbeing. The literature reflects a general usage of

Table 2.2 Social wellbeing indicators and examples

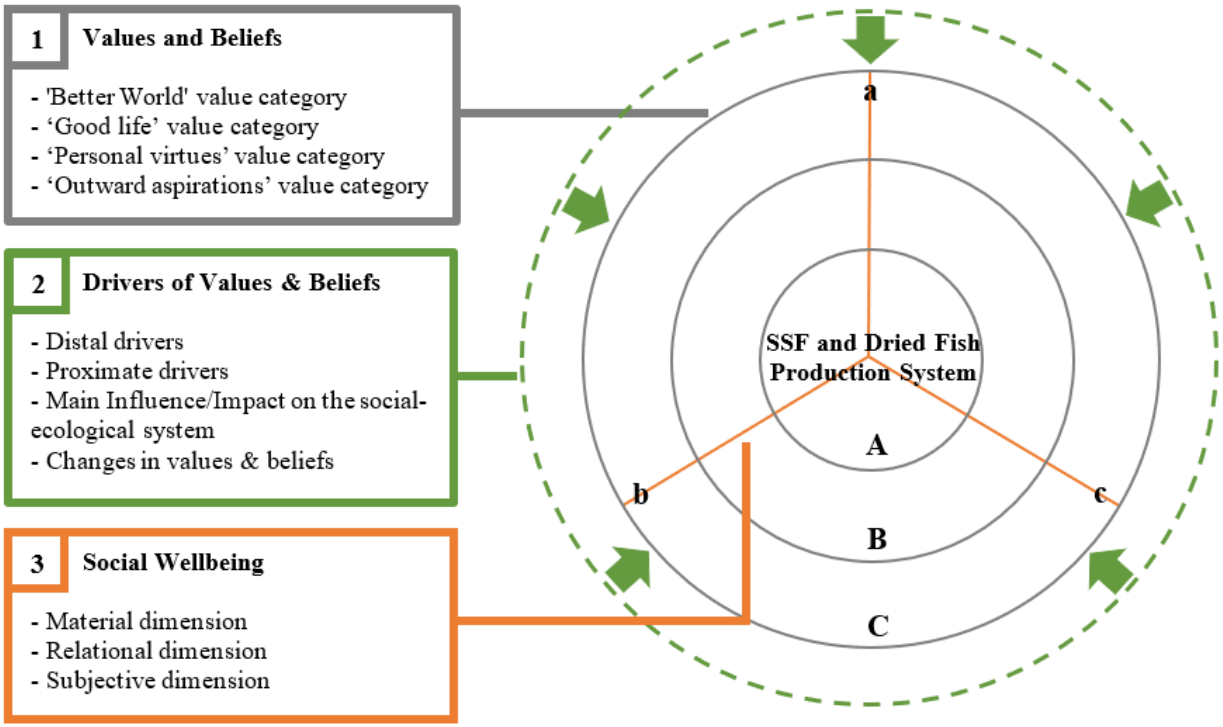
Dimensions	Indicators	Examples
Material	Raw material resources	Access to provisioning ecosystem services, species and natural materials targeted for fishing or collection
	Other material resources	Access to fishing boats and nets, income, assets, level of consumption, social welfare provision, housing quality, public infrastructure, health services, availability of food and water, sanitation, land, money, credit, shops
	Social support network	Information, goods and services, status within society, emergency access system
	Human resources	Age, life experience, source of livelihood and diversity, job security, formal and informal education, marital status, physical health
Relational	Organizational belonging	Social, political, cultural affiliations (e.g., religious groups), fisher groups (e.g., co-ops, networks), perceived position in household and in community, regional and national institutions, global markets and international institutions
	Societal infrastructure	Laws and policy, political autonomy, employment and livelihood opportunities, access to public goods, schools, colleges, clinics, hospitals, places of worship
	Social capital	Support networks, personal relationships, community and family cohesion, strength and diversity of social ties, class, religion and caste relations, equity, leadership, kinship, love and care
Subjective	Identity	Social, political, cultural identity (e.g., ideologies influenced by caste, gender, religion, race, ethnicity, age, disability), mental health, sense of place
	Perceived quality of life	Aspiration gap (i.e., people's interpretation of whether they have achieved their goals), beliefs, values, norms, satisfaction (i.e., the gap between ideal and actual reality), hopes, fears

Note. Adapted from Armitage et al. (2012); Britton & Coulthard (2013); Weeratunge et al. (2014); White (2009a).

social wellbeing as a blanket term for good social relations, a category of human wellbeing (MEA, 2005), and social welfare (see Abunge et al., 2013; England, 1998; Porter, 2012). As different communities' preferences may vary depending on the culture and society they belong, the literature argues that a single or universal objective of wellbeing should not be followed (Lee et al., 2015). For the scope of this research, relevant indicators of social wellbeing, as conceptualized by White (2009a), are indicated in Table 2.2. These indicators provide a foundation for wellbeing-related data analysis and were chosen for their relevance to small-scale fishing communities as also backed by existing literature.

2.5 Conceptual Framework

The application of a conceptual framework is useful in any field of research and is generally employed to determine what will and will not be included in the study. The conceptual framework used for the purposes of this study is depicted in Figure 2.3, visualizing the research constructs and the connections between them. The three research objectives (Box 2.1) are color-coded in the framework, represented in grey, green and orange, respectively. Values and beliefs are characterized by the main four value categories and represent the core research objective '1'. This objective tries to cover the diverse values and beliefs; and their meanings that are hidden in the small-scale fishery (SSF) and dried fish (DF) production of Sagar Island. The study considers values and beliefs of fishers/dried fish producers in all three scales (micro-, meso-, macro-scale). Research objective '2' investigates the evolution of values and beliefs and the main drivers active behind them. It explores key drivers operating at multiple scales that influence social-ecological changes, and therefore impact the values and beliefs in SSF and DF producers of the island. Finally, research objective '3' explores the connections between values and beliefs and three dimensions of social wellbeing in SSF and DF production of the island. The color-coded shapes correspond with their respective objectives, illustrating the interconnected nature of the research and how all concepts link to one another in the course of the study, from its initiation to end goal.



LEGEND:

a: Material dimension

b: Relational dimension

c: Subjective dimension

A: Values & Beliefs/Drivers/Facets of social wellbeing in micro-level of scale (Fisher/Dried fish producer individual, household)

B: Values & Beliefs/Drivers/Facets of social wellbeing in meso-level of scale (Fishing village/Community)

C: Values & Beliefs/Drivers/Facets of social wellbeing in macro-level of scale (The general public/Government)

Figure 2.3 Conceptual framework

The three research objectives of this thesis are presented in Box 2.1. The connection between values and wellbeing is not arbitrary, as the two concepts are deeply and inextricably related (Deneulin & McGregor, 2010). Small-scale fisheries are often vulnerable because fishers/dried fish producers associated with it are geographically isolated, economically deprived, politically voiceless, and are considered culturally low class (Islam, 2011; Rahman et al., 2002). Contrary to this vulnerability, fisheries are more a 'way of life' (Gatewood & McCay, 1990; Onyango, 2011) as they offer life-defining social and cultural values to the people involved (Johnson et al., 2018). It is because of this reason that many fishers choose to stay in fishing despite the livelihood uncertainty and the life risks involved in it (Pollnac & Poggie, 2008; Pollnac et al., 2001). The other point to consider is that the pursuit of a good life, or living well, is directly related to the particular values to which one subscribes. Therefore, we can conclude that the ability to live well

relies heavily upon one's socially-recognized capability to achieve something which is valued (Johnson et al., 2018). Capturing diverse values and beliefs hidden in small-scale fisheries and understanding their impacts on the social wellbeing of fishing communities is essential not only for improving the management of fisheries resource but also for securing sustainable livelihoods of fishing communities. In the following chapter, the case study context (Sagar Island, Sundarbans, India) and the methodology employed in this research are introduced in greater detail.

Box 2.1 Review of research objectives

1) Identify the diverse values and beliefs and their meanings that are hidden in the small-scale fishery (SSF) and dried fish (DF) production community groups;

2) Define the key drivers of values and beliefs and how they have affected the values and beliefs of community groups; and

3) Examine how the values and beliefs of community groups are connected to their social wellbeing (i.e., material, subjective, and relational wellbeing)

CHAPTER 3
Research Area and Methodology

3.1 Introduction

This chapter first explores the case study context in this research - Sagar Island, Sundarbans, India. Then, it defines the methodology and data collection methods employed to conduct this research, including issues of sampling and the researcher's role in the Sagar Island context. Limitations of these methods and the strategies used to address those limitations are also discussed.

3.2 Case study: Sagar Island, Sundarbans, India

The Sundarbans is situated in the largest protruding delta on this planet, created by the rivers Ganges, Brahmaputra and Meghna, with all three coming together in the Bay of Bengal. The Sundarbans is the nursery grounds for nearly 90% of the important commercial aquatic species of eastern coast of India (Chandra & Sagar, 2003). Hence, a large population living in the Sundarbans is dependent on fishery activity. The delta consists of a network of mudflats and islands created by accumulated sediment loads these rivers carry from their Himalayan headwaters. These islands are separated by innumerable rivers, creeks, and tidal waterways, making most of the land part inaccessible. Four protected areas of the delta are declared as reserved forest, receiving the recognition as a World Heritage Site, by UNESCO in 1989 (Figure 3.1). The Sundarbans, located within 21°32′ to 22°40′N and 88°05′ to 89°51′E, covers an area of approximately 10,000 km square of which 62% lies within Bangladesh and 38% in India (Islam, 2014), and forms the largest contiguous mangrove forest on earth. The region is characterized by a tropical climate with a dry season between November and April and a wet monsoonal period over the rest of the year (Ghosh et al., 2015). The total annual amount of precipitation lies between 1500 and 2000 mm. During the monsoon season, tropical cyclones and smaller tidal events regularly hit the area, causing severe flooding and wind-induced damages (Gopal & Chauhan, 2006). Seasonal mean minimum and maximum temperatures vary from 12°C to 24°C and 25°C to 35°C, respectively (Banerjee, 2002).

After agriculture, fishing is the most common means of livelihood in the Sundarbans (Danda, 2010). The total estimated number of households in the Sundarbans that list 'fishing' as one of the family occupations is 11% of the households inhabiting the area (Sánchez-Triana et al., 2014). This percentage goes up to 60-70% in areas with easy access to rivers (Sen, 2019). Climate

change-related weather events and sea-level rise are the most important drivers of out-migration, food insecurity and poverty in Indian Sundarbans (O'Donnell, 2015). The Climate Change Vulnerability Index (CCVI) 2011 rates 16 countries out of 170 countries in the World as 'extremely risky' regarding climate change impacts, and India is ranked 2nd after Bangladesh in terms of such risk (Roy & Guha, 2017). The area has been associated with high rates of out-migration and displacement. It is worth mentioning that this area is populated by some of the world's poorest people, characterized by low levels of socio-economic indicators such as per capita income, attained level of education, and food consumption per capita (Roy & Guha, 2017). Hazra et al. (2014) stated that 34% of the 4.6 million people who inhabit the islands of Indian Sundarbans live below the poverty line.

The Sundarbans acts as a buffer zone to over 60 million people living across the coastline of India and Bangladesh, whose lives, properties and infrastructure, worth billions, are protected from extreme weather events by this barrier. For instance, in May 2009, much of the momentum of cyclone Aila was absorbed by its mangroves, saving the city of Kolkata and other urban sprawls in close proximity (Payra et al., 2016). Another strategic and economic importance of the Sundarban area is derived from the Gangasagar pilgrimage, which is the second-largest congregation of humankind (after the holy Kumbha Mela in India) and takes place in Sagar Island - the meeting point of the Ganges river and the Bay of Bengal.

The case study area - Sagar Island - is located on the south-west edge of the Indian Sundarbans. Hence, it is extremely exposed to coastal flooding, storm surges and cyclones, leading to high rates of erosion and salinization (Ghosh et al., 2014). Coastal erosion has reduced the landmass of the delta block of Sagar where originally it had three inhabited islands named Sagar, Ghoramara and Lohachhara. Ghoramara Island experiences inundation in more than two-thirds of its land part while Lohachara Island was submerged in the Hooghly River in 1991 (Ghosh et al., 2014). The majority of the inhabitants of these two submerged lands had migrated to Sagar Island, contributing a sudden surge to Sagar's population (Ghosh et al., 2014). Currently, the island covers an area of 282.11 km^2 and is inhabited by 212,037 people (Census of India, 2011). Its latitudinal and longitudinal extents are from 21°36′N to 21°56′N and from 88°02′E to 88°11′E, respectively. The island is surrounded by the Hooghly River to the north and west, the Muriganga River to the east, and the Bay of Bengal to the south.

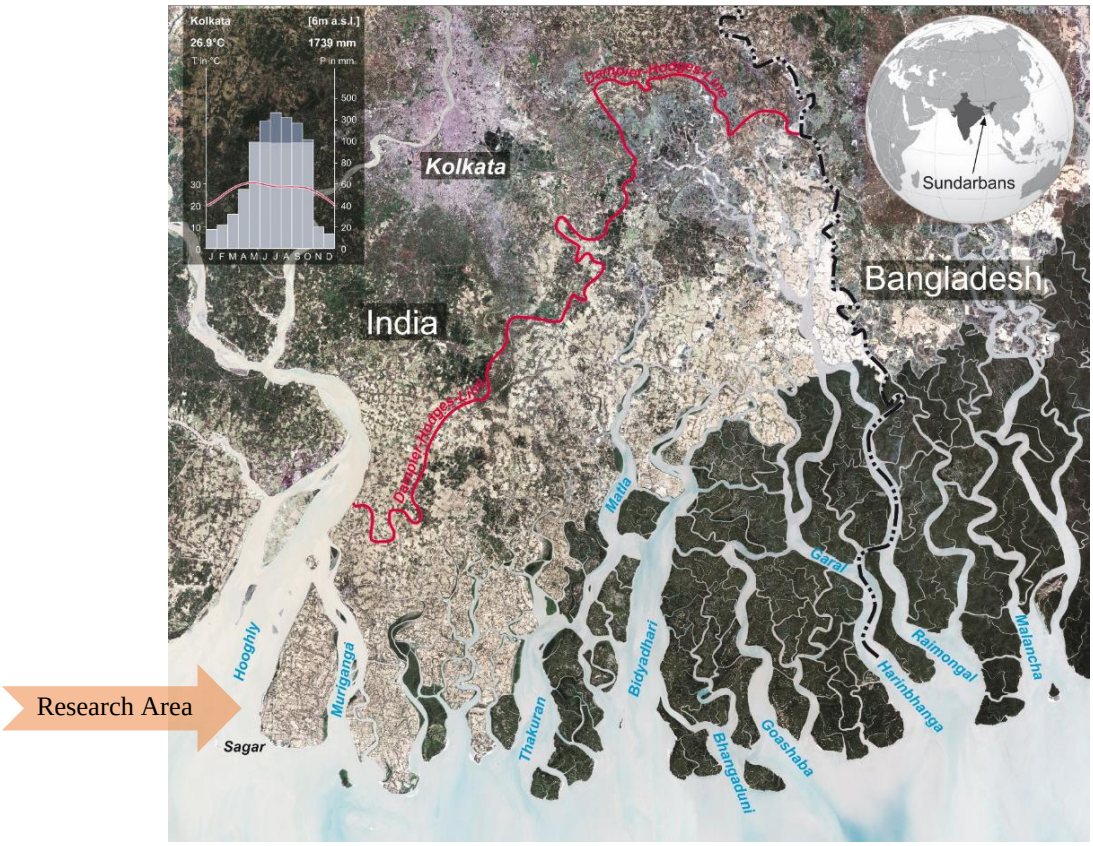


Figure 3.1 The overview of the Indian Sundarbans. Case study - Sagar Island is located on the south-west edge of the Indian Sundarbans. The mangrove forests appear dark green, and the surrounding agricultural land is yellowish-brown. Settlements appear purple. The Dampier-Hodges-Line (imaginary line drawn in 1829-1830 to mark the northern boundary of the Sundarbans delta) marks the boundary of tidal influence and roughly marks the former extent of mangrove forests. Insets show the location of the Sundarbans and a climatic diagram of Kolkata representing the climatic conditions of the Sundarbans. *Note.* Adapted from Ghosh et al. (2015).

3.3 Research Approach

The research methodology chosen for this study was largely qualitative, justified for its rigor to describe the complex human perceptions and interactions (Anderson, 2010), which was the objective of this study. This approach is defined by its "collection, analysis, and interpretation of data that are not easily reduced to numbers. These data relate to the social world and the concepts and behaviors of people within it" (Anderson, 2010, p.1). It can be argued that "qualitative research is great for addressing 'how' questions…; for understanding the world from the perspective of those studied (i.e., informants); and for examining and articulating processes" (Pratt, 2009, p. 856), which is precisely the aim of the study - to determine how values and beliefs are connected to social wellbeing of the community. Some quantitative analysis was also conducted through the

tallying of results, as will be described below.

The scientific method was inductive, deriving final inferences and conclusions from the observations made in the research field; followed a relativist ontology, one in which multiple realities or 'truths' exist which are all subject to change and what is real is shaped by context and evolves based on human experience; and a largely empiricism epistemology, in which the source of knowledge is input from sensory experience (Potter, 2016). Thus, it can be construed as a constructivist or critical theorists' paradigm, chosen over positivism due to the study being based in human virtues, interactions and experiences and recognizing that realities are relative and will be based on the respondent's perspectives.

Achievement of the research objectives entailed primary data collection in the form of semi-structured interviews, a survey, and focus group discussions carried out in the study area. In combination, these methods of data collection allowed for better understanding of local values and beliefs and their relations to social wellbeing in the community of the region. As the study focused on social actors, their values and beliefs, and the relationship between their values and social wellbeing, the research was analyzed through a descriptive research design. This research design was chosen for this study due to its ability to describe the facts and characteristics of a given population systematically and discover associations or relationships between the selected variables (Dulock, 1993) (values and beliefs, key drivers, facets of social wellbeing, and gender in this research), aligning with the objectives of the study.

3.3.1 Case Study Approach

The case study approach is defined as being "useful to employ when there is a need to obtain an in-depth appreciation of an issue, event or phenomenon of interest, in its natural, real-life context" (Crowe et al., 2011, p. 1). It allows for detailed analysis of multi-faceted issues in their natural settings. It is further defined by contemporary research issues and contexts where researcher's control is limited (Yin, 2013). The research study emphasizes the significance of issues affecting both positively and negatively the contemporary coastal communities, including fisheries resource management, community wellbeing; and encompassing values and beliefs context unable to be influenced by the researcher. The central principle of the case study approach is exploring an issue in its natural and real-world context rather than experimental design in which the researcher strives to control and manipulate variables in question. In qualitative case study-based research,

objectivity does not refer to controlling variables, but rather, an "openness [and] willingness to listen" (Strauss & Corbin, 1998), which is a crucial aspect of working with people. One of the limitations of this approach is providing little basis for generalization of results to the wider populations (not to be a representative of the wider body of similar instances) as the approach deals with only one event/group. This means that the conclusions drawn from a particular case may not be transferable to other settings.

The application of the case study method aims to capture explanatory information, and answer questions such as "how", "what" and "why," describing and exploring events in everyday contexts (Crowe et al., 2011). In the context of the small-scale fishery in Sagar Island, it focuses on "what" values and beliefs exist and are in conflict/congruence with each other, "how" values and beliefs of the community impact their wellbeing, and "why" social-ecological changes are linked to existing values and beliefs. Finally, the case study approach aligns with the constructivist standpoint, as it is built upon a social construct of reality and enables participants to share their stories (Baxter & Jack, 2008). The rapport building between researcher and respondent allows for different views of reality to be described, and for a better understanding of respondents' actions. The selected case study of Sagar Island, Sundarbans, India, has the potential to contribute to a broader understanding of values and beliefs in the small-scale fishery sector of India and other contexts as well. It provides exploratory elements to generate data for future research on values and beliefs and community wellbeing linkages, describe social-ecological changes, and document local perceptions on the fishery management and community wellbeing. The findings of this research may provide vital insights for issues concerning social-ecological changes and fishery resource governance.

3.4 Research Methods for Data Collection

There were five methods in the data collection process, summarized in Table 3.1. Each of these methods is discussed in detail in the following subsections.

Table 3.1 Overview of data collection methods

Method	Purpose
Literature Review (Sec 3.4.1)	▪ Extract existing data relevant to (1) case study context (e.g., location, policy, demographics); (2) theoretical context; (3) research questions (e.g., values and beliefs, wellbeing, social-ecological drivers) ▪ Increase familiarity with the historical background and prevalent culture in the research field ▪ Deductively develop a preliminary framework and context-specific interview and survey questions
Participant Observation (Sec 3.4.2)	▪ Engage with actors in communities ▪ Seek out potential research participants ▪ Build rapport with communities ▪ Gain a preliminary and informal understanding of the cultural context ▪ Identify important information that might be unnoticeable to community members
Semi-structured Interviews (Sec 3.4.3)	▪ Gather data on the visible and hidden reasons behind the ranking of the most (and least) esteemed values and beliefs among community members ▪ Distinguish differences in values and beliefs between male and female individuals in the community ▪ Examine connections between 'values and beliefs' and 'social wellbeing' in depth ▪ Gain direct anecdotal knowledge about how social-ecological system has changed and affected values and beliefs ▪ Define the perceptions over households' social wellbeing ▪ Providing a ground for sensitive topics which people may feel uncomfortable discussing in a focus group
Focus Group Discussions (Sec 3.4.4)	▪ Discover how male and female groups think and feel about a topic and why they hold certain values and beliefs ▪ Validate 'values and beliefs' - 'social wellbeing' connections described during interviews ▪ Validate the connections between the drivers of values and beliefs, changes and impacts of SESs described during interviews ▪ Gain suggestions and potential solutions to problems identified ▪ Promote engagement and communication between actors
Household Surveys (Sec 3.4.5)	▪ Identify the most (and least) esteemed values and belief among community members ▪ Identify the perception of community members regarding the requirements for a successful life ▪ Triangulate data from focus group discussions and semi-structured interviews

3.4.1 Literature Review

A literature review is defined as a "comprehensive study and interpretation of literature that addresses a specific topic" (Aveyard, 2010, p. 2). It was conducted to obtain a conceptual and theoretical understanding of previous research on the three areas of interest, namely: values and beliefs, community wellbeing, and drivers. The literature review surveys scholarly articles, technical reports, books and other secondary sources (e.g., diaries, videotapes, photos, letters, newspapers) for essential information prevalent to the three areas of research. It provides a theoretical baseline for me as the researcher, allowing me to become familiar with the research

and identify any gaps that I may attempt to address through my study, warranting why further work was required. By conducting the literature review, I was able to “systematically search, critique and combine the literature to demonstrate a gap in the existing research base" (Aveyard, 2010, p. 1) and understand both the research and the methods previously used to investigate the three main areas. The literature review is conducted with the help of Mendeley reference management software, chosen for its web browser and word processor integration, in which the bibliographic data of research materials were generated and organized in broad categories: SSF and DF production, values and beliefs, social-ecological changes, wellbeing, methodology, study area, gender, official reports. The same software program was also used to generate the list of references.

3.4.2 Participant Observation

During the initial data collection stage, I was engaged in several informal interactions and participant observations to gain a foundational understanding of community and cultural dynamics and to build social capital. I became accustomed to the new environment, and exposed to community life, sought out potential research participants and established an understanding of the community context and setting. I observed the process of fishing and dried fish production, the interactions among the members, and how the small-scale fishery on the island was being managed. During the process, I became acquainted with several fishers and dried fish producers of the island, and most of the observations were accompanied by casual conversations with them. It should be noted that this process would be hard and even impossible without getting help from the Secretary of the Fishermen Association who is a reliable and respectable person in the community. The observations made during fieldwork (i.e., Sep 2019) were documented in a journal, organized sequentially by date. Notes pertained to individual and group actions, notable objects (e.g., goddess of Ganges), places (e.g., the ashram of Kapil Muni), and resources (e.g., fish species) of significance, heard anecdotes, significant processes occurring in the setting (e.g., informing new rules and regulations to the community by the Fishermen Association), initial thoughts on what participants define as interesting or troubling (e.g., participants found the local wood unreliable for constructing their boats), and key emerging analytical ideas (e.g., female workers were underrepresented in decision-making).

3.4.3 Semi-structured Interviews

Interviews (i.e., structured, semi-structured, unstructured) are potent tools for the exploration of values, beliefs, behaviors, relationships, emotions, formal/informal roles, and stories (Bryman et al., 2009a). Semi-structured interviews were chosen over structured and unstructured interviews because this method provided a balance of structure and the freedom to explore emerging themes. Semi-structured interviews are largely used in the social sciences and are defined as "a qualitative data collection strategy in which the researcher asks informants a series of predetermined but open-ended questions" (Given, 2008, p. 810). They are described as a verbal exchange between the interviewer and the interviewee, unfolding in an informal and conversational manner (Clifford et al., 2016). Further, they allow for flexibility in the data collection as new topics emerge (Bolderston, 2012), while also maintaining their consistency throughout so that they may be compared (Rowley, 2012).

The semi-structured interview questionnaire was created before fieldwork commenced, and I as the researcher modified and altered it (e.g., length of questions, the complexity of terminology used) during the data collection and after receiving feedback from the first five interviewees. The interviews began with an initial discussion about the interviewee's demographic information and life in the community to build rapport. Then interview questions were used to gain a richer understanding of (1) which visible and hidden reasons are behind the ranking of the most (and least) esteemed values and beliefs; (2) how values and beliefs are different between male and female individuals; (3) the perceptions over households' social wellbeing; (4) how 'values and beliefs' are connected to 'social wellbeing'; (5) which social-ecological system has changed and how it affected values and beliefs (see Table 3.2 for interview details and Appendix A for the semi-structured interview guide). A total of 45 interviews (25 males and 20 females) were conducted in four communities in the Sagar Island: Mahisamari, Beguakhali, Gangasagar, and Dhablat, ranging from 45-90 minutes in length. All the interviews were conducted at the end of September 2019, which was the end of Hilsa season and the start of fishing and dried fish production season. Because I did not have knowledge in the common language of the community (i.e., Indian Bengali), a translator who was a post-doctoral researcher facilitated the translation and transcription of the interviews. All the interviews were recorded on a voice recorder with permission from interviewees. The audio recording of the interviews allows data to be captured more effectively, making it easier for the translator and me to focus on the interview content and

verbal prompts.

Table 3.2 Details of community, dates, and interviews

Community	Date	# of Interviewees	
		Male	Female
Gangasagar	20/09/2019 - 23/09/2019	8	7
Mahisamari	20/09/2019, 26/09/2019	5	5
Dhablat	22/09/2019	8	4
Beguakhali	24/09/2019	4	4

3.4.4 Focus Group Discussions

Focus group discussions refer to “a wide range of approaches to [empower] community members to engage in research that increases citizen power and voice in communities” (Jason et al., 2004, p. 4). In these types of discussions, the researcher “assembles a group of individuals to discuss a specific topic, aiming to draw from the complex personal experiences, beliefs, perceptions and attitudes of the participants through a moderated interaction” (Nyumba et al., 2018, p. 21). They are conducted "in an informal setting to talk about a particular topic that has been set by the researcher. The facilitator keeps the group on the topic, but is otherwise non-directive, allowing the group to explore the subject from many angles" (Clifford et al., 2016, p. 103). They differ from semi-structured interviews in that they rely on and promote interactions and engagement between the different members of the community, allowing the researcher to gather the opinions of a large number of people. Hence, the underlying intentions of this methodology align with the bottom-up, community-focused themes of this research.

I, as the researcher, with the help of the translator, played the role of the facilitator and led the discussions. Two focus group discussions were undertaken as a participatory research component, with a total of 33 people. These two discussions were conducted with two groups: (1) male fishers (boat owners and crew members) from Mayagoalinighat with 18 participants (25/09/2019) - Figure 3.2: left; (2) female dried fish producers (business owners and daily wage laborers) from Mahisamari with 15 participants (26/09/2019) - Figure 3.2: right. The reason behind having focus group discussions separately by gender (males together and females together) is that in homogenous focus groups it can be easier to create an atmosphere where everyone feels comfortable and free to speak out, without having to defend their points of view against others. In a heterogenous focus group the conversation can more easily turn into a debate by the most

dominant people in the group (male members in this scenario), and hence females might not be able to express themselves in front of male participants. Moreover, this separation will provide better ground to explore more about the difference between male and female members of the community. Using preliminary data garnered from semi-structured interviews, focus groups participants created knowledge that made it easier for me to better identify the connections between the values and beliefs, social wellbeing, and drivers of values and beliefs. Moreover, the discussions created a ground for participants to share their concerns and suggestions to the current community problems (see Appendix B for the focus group discussion guide).

Figure 3.2 Focus group discussion with male participants [left] and female participants [right].

3.4.5 Household Surveys

During the semi-structured interviews, a rapid assessment survey took place by employing a questionnaire (see Appendix C for the household survey guide) to identify emerging trends and themes. The questionnaire was translated from English to Bengali and delivered verbally to the participants during the survey because of the illiteracy in the majority of participants. The questionnaire produced a mix of data forms, including nominal data (e.g., How age) and ordinal data (e.g., ranking the range of values associated with fishing community based on their importance in terms of their contribution to the SSF and DF production of Sagar Island). This questionnaire served to: (1) collect demographic information of the community; (2) gather quantitative data on the most (and least) esteemed values and beliefs among fishing communities; (3) acquire the values and beliefs that are in conflict/congruence with each other; and (4) gather quantitative data on how fishing community perceive having a good life (i.e., community social wellbeing) in the island. The respondents for the semi-structured interviews and household

surveys were the same in this study. The study employed a novel method in its data collection as each question from the survey was followed by some semi-structured questions to better understand the embedded reasons behind the rankings. The given responses were crucial as there came some responses in which the informants have low ranked value, for instance, merely because of lack of information regarding it instead of perceiving it as an unimportant value. Further, the key beliefs of the community were acquired during these explanations.

3.5 Sampling and Recruitment

Sampling in this research was done by using snowball sampling (i.e., the process by which new participants are identified by previous participants). Sagar Island in the Sundarban region was used as a location to narrow the geospatial scope of this research. Within the broader community of Sagar Island, five districts located in the south and west coastal area of the island were approached for participation, namely Gangasagar, Mahisamari, Dhablat, Beguakhali, and Mayagoalinighat. These districts were selected because of their: (1) geographical position (Sagar Island is in the extreme southeast island of the Sundarbans and hence its south and west coasts are facing a severe threat from phenomena caused by climate change, including soil erosion, breach of embankments, loss of landmass, and rising sea levels as shown in Figure 3.3); (2) proximity to the estuary and sea (provide both estuary and marine fishing); (3) famous sacred place (the location of Gangasagar pilgrimage at the meeting point of the sacred Ganges river and the Bay of Bengal; the ashram of Kapil Muni); (4) number of immigrants (where the inhabitants of the northern submerged islands are living); (5) previously established social networks with Fishermen Association of Sagar island to facilitate me (the researcher) in sampling and giving useful information.

I interviewed fishers who practice fishing in sea, creeks and estuarine rivers with wooden boats (non-motorized boats and 2-, 4-, 6- cylinder boats) and homemade Styrofoam floating boards; dried fish producers, and employees in the local Fishermen Association. After a number of interviews, it was noticed that in Sagar Island, male members are mainly involved with fishing, and female members are mainly involved with dried fish production. Also, there are different choices male and female fishing members pursue regarding their livelihood and socialization. Therefore, both male and female groups were sampled within each district to gain a breadth of these differences in relation to their values and beliefs. Community members were recruited in consultation with the Secretary of Fishermen Association who acted as the initial informant in the

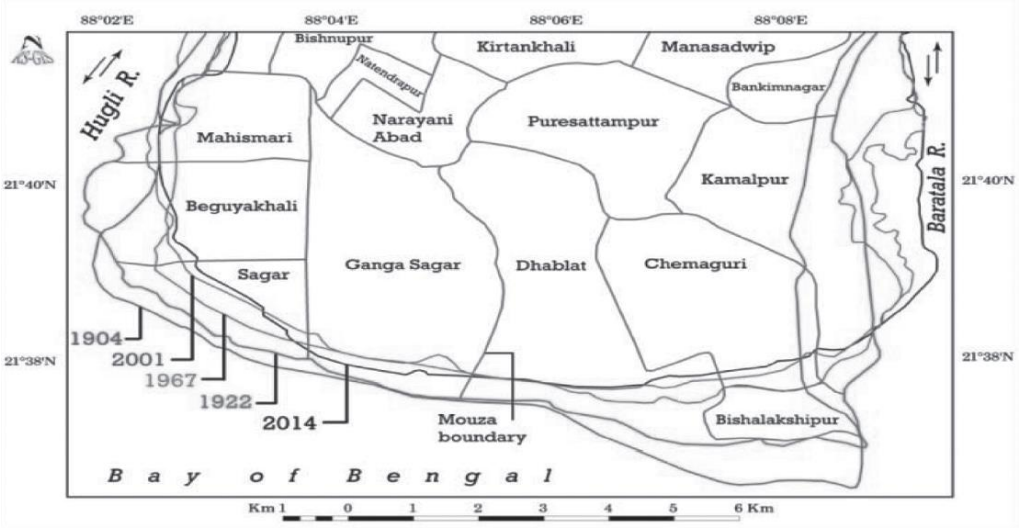


Figure 3.3 Shoreline changes of Sagar Island: 1904–2014. *Note.* Adapted from Roy & Guha (2017).

snowball sampling for connecting me to other potential key informants. Potential participants were approached by me and my translator usually in the morning (8 am-11 am) and evening (4-9 pm) hours, which seemed to be the most convenient for the community. Locations such as the cooperative fishing places (e.g., shops, cafés, restaurants) and homes were chosen according to the preference of the intended participants to recruit them for the research.

3.6 Data Analysis

This section delineates how the data results attained using the methods described above (i.e., semi-structured interviews, focus group discussions, and household surveys) were analyzed. The results of the analysis are presented in Chapters 4-6.

3.6.1 Semi-structured Interview Analysis

Semi-structured interviews have rich details and lack standardized responses. Therefore, interview data were analyzed by qualitative coding, which describes a subjective procedure to data analysis (Richards, 2005). Qualitative data coding is defined as "a way of indexing or categorizing the text in order to establish a framework of thematic ideas about it …. [it is] how you define what the data you are analyzing is about" (Gibbs, 2007, p. 1). Coding encompasses the process of labelling and identifying patterns in the data, and the relationships between them, linking them to the research objectives.

In this research, the semi-structured interview data first underwent a thematic analysis

using qualitative coding with the help of NVivo qualitative data analysis computer software. NVivo was chosen as the data management tool for this study because of its analytical power suitable for this project and its simplicity of use. The analysis process followed three steps: (1) open coding (i.e., initial coding, or descriptive coding and topic coding); (2) axial coding (i.e., focused coding, or analytical coding); and (3) selective coding (Bailey, 2007; Creswell, 2007; Richards, 2005).

Through stage one of the coding process, which entailed open coding, text from each interview transcript was organized into deductive (e.g., social wellbeing indicators categories that appear in literature) and inductive categories (e.g., different cultural facets of social wellbeing that emerged through analysis). These categories are labelled in the NVivo program as 'nodes', whereby each node represented a folder, and quotes from different transcripts comprised the contents of the folder. Quotes were presented as qualitative evidence to support the research findings. Names of the interview participants were stripped from each quote and replaced with their initial letters to anonymize the participants and their networks. Once the open coding process was complete, individual nodes were axially coded in stage two by establishing relationships between nodes (e.g., cultural service bundles linked with components of relational wellbeing). Selective coding was then conducted in the last stage to serve as a validation process, an opportunity to revise codes, and to establish codes to satisfy missing linkages.

3.6.2 Focus Group Analysis

The focus group activities were analyzed using a similar technique applied to the semi-structured interviews above. It took into account aspects of the sessions such as frequency of comments mentioned, and extensiveness and depth of the issues being discussed. The recurring themes and topics of interest were mainly the relationships between the values and beliefs, social wellbeing, and drivers of values and beliefs, and how they are being affected as a result of the changes in SESs.

3.6.3 Household Survey Analysis

The questionnaire results were quantitatively analyzed using a Microsoft Excel spreadsheet. Inferential statistics (taking data from samples and make generalizations about a population) were obtained regarding the percentage of each male and female community group holding a type of

belief or lifestyle. Moreover, inferential statistics were attained regarding ranking the most (and least) esteemed thematic values among fishing communities. The results were coded as 1, 2, and 3 directly as the rank they received (i.e., 1 implies 'not important', 2 implies 'somewhat important', and 3 implies 'very important'). For instance, it was coded as 1 if a respondent said that the 'honesty' value was not important in terms of its contribution to the SSF and DF production of Sagar Island. Then, the mean values of these codes were acquired by adding all the values together and then dividing the result by the number of respondents. The mean values further were rounded to the nearest 0.5 and used to create figures for representing the importance hierarchy among the male and female members. Descriptive statistics (describing data by visual outputs such as bar chart) were attained also regarding the perception of community members on requirements for a successful life (i.e., the number of community members that believed a specific facet of wellbeing was 'important').

3.7 Limitations

The limitations of this qualitative research are presented in Table 3.3 by categorizing them into sampling, researcher, and respondent.

Table 3.3 Limitations of this research within sampling, researcher, and respondent categories

Sampling	▪ Non-random snowball sampling methods potentially increase sampling bias (i.e., there may be a tendency towards choosing participants for characteristics such as their availability, willingness, and friendliness), sampling error (i.e., the participants may not be truly representative of the target population as a whole), and non-response error (i.e., not considering the perspectives of those who choose not to participate) (Salant & Dillman, 1994). ▪ Mayagoalinighat fishers and dried fish producers are underrepresented in the sample because of their low accessibility (they are represented in the male focus group discussion). ▪ The study duration was very short, and it was not possible to collect data from other stakeholders (e.g., middlemen, NGOs, Fishery Department of West Bengal, Central Marine Fisheries Research Institute (CMFRI), West Bengal Forest Department), and same time constrain was responsible behind not having a focus group discussion with male and female members both in one place together.

Researcher	▪ The presence of a researcher automatically results in a situational change. Therefore, a primary limitation of this research is the inability to directly measure indicators in a natural setting. ▪ The unstructured nature of interviews and focus group discussions will lead to a diversity of answers. As such, the researcher runs a risk of being inconsistent when coding responses during analysis. ▪ There is a possibility of confirmation bias (i.e., placing emphasis on what the researcher wishes to find rather than properly analyzing data) and measurement error (i.e., poor research design, improper variables measured) (Creswell, 2007). ▪ Challenges of researcher for being identified as an outsider to the community impacts the researcher's interactions with the community and the collections and analyses of data that are exaggerated by the community (i.e., some community members identified the researcher as a privileged tourist or someone in charge from the government). ▪ With a dependence on translation service to aid in language skills and cultural cues, data could be misinterpreted. ▪ Objectivity is difficult to maintain during the data collection and analysis process.
Respondent	▪ Problems exist with acquiescence bias (i.e., the tendency for participants to agree to what is being presented), social desirability bias (i.e., feeling the need to give socially desirable responses or to present oneself in a more positive light than is warranted by the facts), and inaccurate responses from lack of interest and energy (Bryman et al., 2009a). ▪ Social desirability bias is particularly prevalent in focus group scenarios, or when more than one interviewee was questioned at the same time. ▪ The respondent could develop a desire to please the interviewer rather than providing true information (Bryman et al., 2009b). ▪ Having a female interviewer and translator (as was in my case) automatically ensures an atmosphere where female respondents feel comfortable and free to speak out, but it could create an opposite effect for males. So, males may not be able to express themselves easily or may incline to provide wrong information (e.g., by a desire to please the interviewer).

3.8 Ethics

This research project received full ethics clearance from the University of Waterloo Office of Research Ethics under ORE # 41043 on June 13, 2019 (see Appendix D for ethics clearance notice).

CHAPTER 4

Values and Beliefs in Small-scale Fishery and Dried Fish Production

4.1 Introduction

Small-scale fisheries are often vulnerable because fishers/dried fish producers associated with them are geographically isolated, economically deprived, politically voiceless, and are considered culturally low class (Islam, 2011; Rahman et al., 2002). Even in academic circles, small-scale fisheries remain understated worldwide because the majority of researchers often limited to the economic aspect. In reality, fisheries go way beyond by providing important social and cultural values to the people involved (Johnson et al., 2018). It means fishing is a 'way of life' (Gatewood & McCay, 1990; Onyango, 2011), and many fishers choose to stay in fishing not for economic benefits alone but for multi-faceted reasons that lead to job and life satisfaction (Pollnac & Poggie, 2008; Pollnac et al., 2001). Capturing the social and cultural values of small-scale fisheries is essential not only for improving the management of fisheries resource but also for securing sustainable livelihoods of fishing communities (Johnson et al., 2018) (Sec 2.4.2).

In this chapter, the finding for objective one of the thesis (Box 4.1) has been presented by identifying the diverse values and beliefs and their meanings that are hidden in the small-scale fishery (SSF) and dried fish (DF) production. The chapter argues that by studying the diverse values of small-scale fishery in Sagar Island, we could understand what matters to the people and what is desirable to the targeted society.

Box 4.1 Review of research objectives

> **1) Identify the diverse values and beliefs and their meanings that are hidden in the small-scale fishery (SSF) and dried fish (DF) production community groups**;
>
> 2) Define the key drivers that have affected the values and beliefs of community groups; and
>
> 3) Examine how the values and beliefs of community groups are connected to their social wellbeing (i.e., material, subjective, and relational wellbeing)

In the next section (Sec 4.2), diverse values and beliefs within SSF and DF production, which are divided into four broader categories, namely, 'better world' (Sec 4.2.1), 'good life' (Sec 4.2.2), 'personal virtues' (Sec 4.2.3), and 'outward aspirations' (Sec 4.2.4) have been explained by their level of importance and common beliefs among the fishing members of Sagar Island. Finally, I

conclude the chapter by reviewing the key contributions of SSF and DF production of Sagar Island on the current status of values and beliefs in three main categories of fishery stakeholders (Sec 4.3). Throughout the chapter, the value scheme suggested by Song & Chuenpagdee (2015) and Song et al. (2013) has been used as the reference. This inventory of 20 distinct values (Table 4.1) reveals what the values mean among fishing communities.

Table 4.1 Twenty thematic value types in fisheries

	Types of values	Descriptive statements	Value categories
1	Ecosystem conservation	Healthy marine ecological system	Better world (what is desired for the world/broader society)
2	Peacefulness	Fishing villages without conflicts	
3	Equality	Equal fishing opportunity among fellow fishers	
4	Freedom	Freedom to decide when and where to fish	
5	Ecological knowledge	Comprehensive knowledge on marine ecosystem	
6	Wealth	High economic income from fishing work	Good life (what is desired for an individual's satisfaction)
7	Spiritual wellbeing	Religious practices and sacred rituals through contact with nature and fishing work	
8	Secure livelihoods	Secure livelihoods from fishing work	
9	Hedonism	Enjoyment and pleasure in fishery life	
10	Self-esteem	Sense of pride for working in the fishing industry	
11	Novelty	Creativity in fishing work	
12	Benevolence	Concern for the welfare of other fishing workers	Personal virtues (desired virtuous inner quality of a person)
13	Moderation	Moderate catch target	
14	Honesty	Integrity in fisheries governing system	
15	Attachment to place	Bond with the marine ecosystem and the community	Outward aspirations (desired relationship with human/object outside of self)
16	Social cohesion	Cohesion among the members of the fishing community	
17	Influence	Strong leadership in fishery management	
18	Social recognition	Greater public recognition of fishing work	
19	Tradition	Many young people taking an interest in fishing tradition	
20	Conformity	Acceptance of fishery rules and regulations	

Note. Adapted and modified from Song & Chuenpagdee (2015) and Song et al. (2013).

4.2 The Structure of Values and Beliefs in SSF and DF Production

Value theory in social science explains that values are constructed through human action while they also motivate human action (Johnson et al., 2018). Hence, we try to live consistently with our values while adjusting them according to our lived experiences (Graeber, 2001). In this section, the question is not only as to what values are attached to SSF and DF production but also to what

they mean for the small-scale fishing people. The present study intends to identify diverse common beliefs and the level of importance for every value held by male (n=25) and female (n=20) members of SSF/DF production in Sagar Island. Through this process, the relations of conflict and congruence among values and beliefs (see 'structure of values' in Schwartz, 1970) of fishing members will be revealed. According to Schwartz (1970), actions in pursuit of any value can have consequences that come in conflict with some values while are in congruence with others. In fisheries governance, having high numbers of conflicting values would not only cause the current issues in the governance to persist, but would also contribute to lower governability (Song et al., 2013).

The set of common value types (Table 4.1, above) defined by Song et al. (2013) outlines the most widely discussed or potentially important values in fisheries governance research. Song et al. (2013) further, categorized these twenty distinct thematic value types into four broader categories (see Song & Chuenpagdee, 2015; Song et al., 2013). The four categories are: (1) 'better world' which implies what is desired for the world and broader society; (2) 'good life' that includes what is desired for an individual's satisfaction; (3) 'personal virtues' which means desired virtuous inner qualities of a person and; (4) 'outward aspirations' that includes desired relationship with humans or objects outside of self.

4.2.1 'Better World' Value Category

'Better World' value category includes values that are desired for the world/broader society. They strive for the welfare of all people and for nature by improving ecosystem conservation, advocating equality, or deepening knowledge (see Schwartz, 1970). In general, the related values do not develop in society until people become aware of the scarcity of natural resources and until they encounter others outside the extended primary group (see 'universalism' value in Schwartz, 2012). People may then realize that failure to accept these others will lead to life-threatening conflict. In addition, they may realize that failure to protect the natural environment will lead to the destruction of the resources on which their lives depend (Schwartz, 2012).

Correlations between the values system and worries about societal problems support our present set of categorization (see Schwartz, 1970). Respondents indicated the extent to which they worry about poverty, hunger, intergroup conflicts especially among different groups of castes and religions, and destruction of the environment in India as well as the world at large. The importance

hierarchy of ‘better world’ value types among the fishing community of Sagar Island is represented in Figure 4.1.

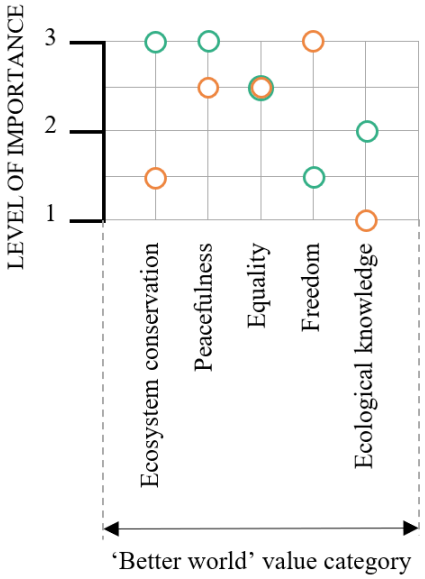


Figure 4.1 Importance hierarchy of ‘better world' value types in the small-scale fishery and dried fish production of Sagar Island based on the male [green] and female [orange] fishers and dried fish producers who judged each value (note that 1 implies ‘not important’, 2 implies ‘somewhat important’, and 3 implies ‘very important’).

Note. Data are from household surveys answered by fishers and dried fish producers of Sagar Island

LEGEND

- Male members
- Female members
- Male and Female members both

Male members of the fishing community are involved mainly with small-scale fishing rather than dried fish production. They ranked ‘ecosystem conservation’ and ‘peacefulness’ as the most important values in the ‘better world’ value category. This study has discovered that the ecosystem’s vital connections to the community’s livelihood became visible during the past 5-10 years to male members of the community rather than females upon experiencing drastic changes in the ecosystem and their income. The reasons behind it were revealed by some fishermen through statements such as “Unlike my wife, I am in direct contact with the water” and “I speak about the changes in seasonal catch with fellow fishers constantly”. It should be noted that most fishermen referred to ecosystem changes as a reason for the decline in their annual income and livelihood situation.

The male and female fishing members believed that they are suffering from lack of sufficient income throughout the year as much as they cannot afford conflict among each other (i.e., members of the community). Some of them added that if they lose ‘peacefulness’ in the village, their mental health, as well as their secure livelihood, would be in danger as they will not be able to support each other emotionally or financially during tough times. This belief led male fishers to give high rank to ‘equality’ value by referring to the fishery resources as common elements that must be accessible equally to everyone on the island. A fisherman with 24 years of fishing experience said:

> *One thing I love about this village is that we all try our best to maintain peace in it. We are mixed! From different places and different religions. But we keep this strong bond of friendship with each other because we have only each other to support in harsh moments. I am aware that in other villages in the region and even in other places in India, people are fighting over their differences which is sad.*

(Male, Fisher)

Considering male members of the fishing community are well aware of the importance of ecosystem conservation and peacefulness, they accorded low importance to the 'freedom' value. The 54% of male members (n=25) expressed that there should be rules and regulations to define when and where they need to fish; otherwise, their current situation could be even worse because fishers could end up being in conflict with each other. All of them added that the current regulations should be updated according to the recent ecosystem changes in the region because they can no longer catch sufficient fish within their fishing territory. Regulating the incessant operation of fishing trawlers, delivering allowance during fishing ban period, and accessibility to more livelihood options were the most mentioned responses. Fishers further believed that their preferences should be given priority when it comes to where and when to fish, mainly because of their minor impacts on the ecosystem in comparison with fishing trawlers.

There have been diverse views on the importance of 'ecological knowledge'. Hence, male fishers illustrated medium importance to 'ecological knowledge'. Those members who put low importance to the value of 'ecological knowledge' attributed their reason for such to their poor economic conditions such as this:

> *There will not be much of a difference if one knows everything about ecology since the knowledge will not change the desire of human being to survive. Even if we harm the ecosystem by catching small fishes, we are obliged to catch them for our survival. Besides, it is fishing trawlers that are harming ecosystem the most, and government that is not banning them. Our business will disappear in the near future if they continue like this.*

(Male, Seasonal fisher)

Female members are active mainly in fish processing (Figure 4.2) and catching shrimps and small fishes in the riverside. Therefore, they showed little emphasis on 'ecosystem conservation' and 'ecological knowledge' values according to their responses simply due to lack of knowledge and awareness regarding the topics related to the ecosystem. When it comes to women, weak inter-gender (between males and females) relationships among community members and family members have been observed during the field visits. The members who were in direct contact with the sea for fishing, mostly males, have demonstrated their dissatisfaction regarding their wives'

"lack of interests" in getting to know the real situation in the fishery. It has been found that women's lack of knowledge is derived mainly from gender issue in social deprivation rather than 'lack of interest' among females. A local secretary of the Fishermen Association describes his point of view as:

> *The average rate of education among women is very low in this locality plus women are very shy to go out and interact with the people who are coming from outside the village or from a foreign country. For example, when last year an American couple visited the place and tried to call women for a meeting in order to offer some help to them, no women came to attend the meeting. Lack of interaction is the main reason behind their unawareness. These women don't know the current status of their business and the reasons behind the recent changes.*

(Male, Local Secretary of Fishermen Association and active fisher and dried fish producer)

Figure 4.2 Female members are participating in dried fish processing. They use broom on a special net for flipping fish (Photo: Abdar Mallik).

'Freedom' is a strong desirable value among 94% of the female respondents (n=20). They stressed the importance of both 'freedom' and 'equality' by referring to the insufficient amount of fish they have for processing due to meagre catch in the sea. They have found equal fishing opportunity among fellow fishers and freedom in deciding when and where to fish as the solutions to this problem. When it comes to the 'ecosystem conservation' value among female members, only a few of them were able to explain some of the recent ecosystem changes and the necessity of conserving the ecosystem. These members mentioned that they got this information from their husbands or sons who go fishing regularly. The rest female members were unaware of any changes or the necessity of having a healthy marine ecological system.

Common beliefs of the 'better world' value category among male and female members of SSF/DF in Sagar Island have been briefed in Table 4.2. The responses of the informants have shown that the recently growing number of life loss and economic loss made them realize the need for ecosystem conservation in their fishing community. Furthermore, ecological changes were mostly tangible for those who were under the direct influence of the ecosystem changes rather than those who were not in direct contact or had hardly been informed about the changes. As a result, 'ecosystem conservation' and 'freedom' values have been found to have different importance between male and female members as one group holds certain values on average more than the other one.

Table 4.2 Common beliefs related to the 'better world' value category among male and female members of small-scale fishery and dried fish production in Sagar Island

Types of value	Common beliefs among male members of SSF and DF production	Common beliefs among female members of SSF and DF production
Ecosystem conservation	▪ Remarkable reduction in the number of fishes especially Hilsa and extinction of some for the past 5-10 years ▪ Fish are not coming near the shore anymore due to ecosystem destruction ▪ The whole ecosystem is irreversibly destroyed by the dominancy of fishing trawlers ▪ The fishing trawlers cause more damage than SSF ▪ Fishers in SSF damage fish population by using mosquito nets to catch shrimps in the riverside ▪ Weather uncertainty and shift in seasonal changes due to global warming is the biggest challenge for SSF ▪ Industrial and plastic waste, aquaculture and unwanted dead fish release pollute the water ▪ Loss of plants and trees cause land erosion in river and seaside	▪ Reduction in availability of fish per head due to an increase in the number of fishers ▪ Breakage of the overall cycle of fish reproduction is due to fishing trawlers ▪ Family members who work in the water are the source of information about ecosystem services and its changes
Peacefulness	▪ 'The economic uncertainty' and 'the need to work together in harmony' are the most important traits of the business ▪ There is no scope for religious or caste discrimination among people	▪ Everybody in the community is dealing with similar issues and fears in life ▪ Members are trying to help each other in common problems instead of having disputes
Equality	▪ The obligation of going deep into the water for finding fish is for everyone ▪ Fishery resources must be accessible equally to everyone on the island	▪ There is a high dominance of trawling boats in the area ▪ The site needs a school close to the dry fishing area so that kids stay there while

	▪ There is no proper allotment of sufficient fishing area to every boat ▪ The sea experiences the decrease in the number of local boats and an increase in the number of fishing trawlers day by day ▪ Most of local boats are short-lived due to fragile local wood ▪ There should be dedication of quota (reservation) for fishers in the recruitment of job and education	parents work on riverside during the dry fishing season ▪ Islanders need a bridge between Sagar Island and the mainland for transporting fish ▪ Members do not have enough money to repair their boats ▪ Monthly allowance for elders and 'tiger widows (*baghrobidhoba*)' should be delivered
Freedom	▪ Rules and regulations should define when and where fishers need to fish; otherwise, their current situation could deteriorate further ▪ The fishing territory of small boats is too small with low fish availability ▪ Fishing trawlers enter the fishing territory of small boats and sabotage the fish population ▪ There is a need for allowance during the fishing ban period ▪ Having freedom unlike the government or corporate employees because of not being employed by someone else for income	▪ Members need to work in any condition and any possible time for paying back the debt of local moneylender (*Aratdaar*) ▪ There should be freedom in fishing due to insufficient amount of fish for processing
Knowledge	▪ Knowledge is among those who are in direct contact with nature and having fishing experience ▪ There will not be much of a difference if a small-scale fisher knows everything about ecology ▪ Most of members are not privileged with proper education ▪ Low rate of education, shy nature and lack of interaction with outsiders make women unaware ▪ There is a need for government awareness programs to stop harming ecosystem	▪ Awareness or training programs offered by the marine department are inaccessible due to being organized on remote locations ▪ Before, there was a deficiency in the infrastructure of education in the area ▪ It is easy for women to become educated nowadays compared with the past ▪ Lack of awareness and/or disinterested about the current situation of business and livelihood due to illiteracy and lack of social interaction with family members, outsiders, and educated people

Note. Data are from semi-structured interviews, focus group discussions, and household surveys answered by small-scale fishers, dried fish producers, and members of Fishermen Association of Sagar Island.

4.2.2 'Good Life' Value Category

The values under the 'good life' category emphasize the attainment or preservation of a dominant position over people and resource within a social system, together with pleasure or sensuous gratification for oneself (see 'power' and 'hedonism' values in Schwartz, 2012). Schwartz (2012)

states that although pursuing power and achievement values such as ‘wealth’ may harm or exploit others and damage social relations, they help to motivate individuals to work for group interests. Past researchers (Coulthard et al., 2011; Deneulin & McGregor, 2010; White & Ellison, 2007) acknowledge that what a person values materially and the way he/she perceives the question of ‘how he/she is doing’ depends on his/her relationships with others and the ideas that frame this social bonding. In addition, pursuing values that are derived from pleasure and satisfaction (e.g., spiritual wellbeing) does not necessarily threaten positive social relations unlike in power values (e.g., wealth) (Schwartz, 2012).

During the field visit, it was found that the current economic situations of fishery households were determined primarily by the amount of debt they owe to local moneylender (*Aratdaar*) and their ability to pay it off. Life satisfaction of individuals is also dependent on different factors such as where do they stand in comparison to their past situations and also in comparison to the people around them. The importance hierarchy of 'good life' value types among the fishing community of Sagar Island is represented in Figure 4.3.

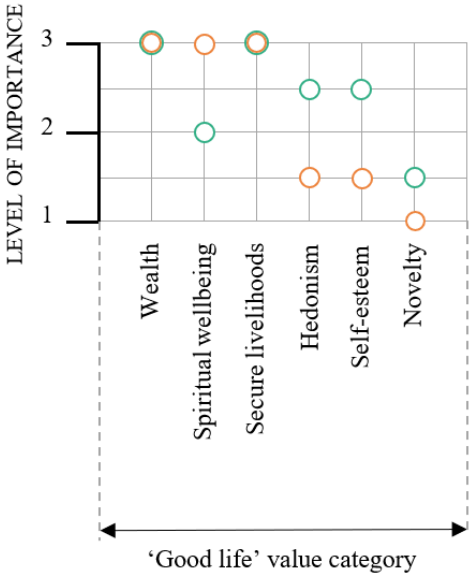


Figure 4.3 Importance hierarchy of ‘good life' value types in the small-scale fishery and dried fish production of Sagar Island based on the male [green] and female [orange] fishers and dried fish producers (note that 1 implies ‘not important’, 2 implies ‘somewhat important’, and 3 implies ‘very important’).

Note. Data are from household surveys answered by fishers and dried fish producers of Sagar Island

LEGEND

- Male members
- Female members
- Male and Female members both

In the ‘good life’ value category, ‘wealth’ and ‘secure livelihoods’ were accorded highest importance value by both male and female members of the fishing community in Sagar Island. Such preference can be gauged by respondents’ statements such as “without having it, you cannot even think about other things in life” and “more than being the most important thing for fishers, it is better to say that it is the fundamental value for everyone on earth to survive”. Also, male members stressed about the vital connection of these values to their livelihoods; an example

includes:

> *The current situation made us more financially and socially deprived than before. Most of us are in debt to local moneylenders. We need to show that we are active in the business in the aim of paying off our debts. That is why I have not sold my boat, and I cannot even think of moving to somewhere else.*

(Male, Former business owner and current monthly-paid fisher)

When it comes to 'spiritual wellbeing', religion holds a special place in the lives of male fishers of Sagar Island. Every activity in the community starting from buying new boats, going to sea in the morning or opening of the fishing season - is performed after a religious ritual, either individually or in the group. For fishers and their families, these practices provide a sense of shared risks and an acknowledgement of divine powers. Among Hindus - the majority of Sagar Island's household (Census of India, 2011) - protection, prosperity and success are expected in a reciprocal relationship with the deities based on offerings and prayers. A sense of fear of, or subservience to, these divine powers can also be observed. During the interviews, male members stated that following traditional beliefs and rituals are part of their routine activities; hence its importance is unquestionable, but they cannot perceive it as the most important value. Two fishers explained:

> *The place I work in Kerala mainly consists of Muslims. There is a belief among the fishers of Kerala that if one boat fails to catch the amount of fish other boats catch in the area, they bring some dry red chili peppers from a mosque and burn it on the boat. In here-Bengal also they bring some holy items from temples and do puja [a Hindu manner of ritual offering] on the boat. We do not see these beliefs, but we believe in them, exactly like the way we do not see the god, but we believe in Him!*

(Male, Seasonal fisher of Kerala)

> *Before the beginning of every fishing season, we repair the boats and re-color them. We start it about ten days prior to the start of the season. After boats get repaired and put in the canals, we do Ganga puja on them towards boat's head. We also do pujas at the start of every voyage. Other than that, the Fishermen Association organize big Ganga puja every year where all the fishers and their families take part together. The whole celebration goes on for 5-6 days when they arrange numerous cultural programs and social activities besides the original puja.*

(Male, Fishing business owner)

Some fishers who have specific rules and obligations in their religions were obliged to sacrifice their religious beliefs and rituals to embrace a lifestyle in accordance with their economic activities. During the discussions, it has been found that this process might create psychological obstruction - e.g., feeling guilty, stress, anxiety and depression - among those fishers. This pattern can be aligned with Schwartz (1970) value theory: actions in pursuit of values have practical,

psychological, and social consequences. One fisherman explained his mental state by referring to his religious belief below. In this example, we can see practically that choosing an action that promotes one value (e.g., vigorously pursuing wealth) may contravene or violate a competing value (e.g., sacrificing religion). Hence, the person who faces the choice may sense that such actions are psychologically dissonant.

> *I am Hindu and holding Vaishnavism [A Hindu denomination in which killing any living things, mostly animals is forbidden, and the followers are normally vegetarian]. I am in this business for 50 years now, but still, I am facing psychological obstruction of catching fish every time I go to the water because of my religion.*

(Male, Fisher and farmer)

When asked about the importance of 'spiritual wellbeing' among females, 74% of them (n=20) associated the reduction in the number of fish or the rise in accidental deaths to religious beliefs. They believed that a fisherman killing a mermaid in the Odisha state of India made deities furious and has led to the decline in the catch. Seeking refuge and blessing for life's protection and economic prosperity by wearing *Maduli* or *Tabeez* (objects which are believed to have magic powers for the sake of protection or bringing luck) was practiced mostly among the women whose husbands were working in the sea. In general, females gave higher importance to 'spiritual wellbeing' than males.

When asked about the 'hedonism', male members declared the relatively high importance of 'hedonism' value in fishery livelihood, but only 45% of them (n=25) felt complete enjoyment and pleasure towards fishing. The respondents gave explanations for their feelings by phrases such as "addiction of fishing", "socializing with others", "very laborious job", "causing severe health problems", "hatred toward the water", and "feeling compulsion towards continuing it". The reasons behind this enjoyment among fishers were briefed in Box 4.2 (the sequence does not reflect priority). On the other side, female members perceive 'hedonism' value as an almost unimportant value in the fishery. Almost all of them indicated that they could not comment on 'hedonism' value as they have been active in dried fish production out of compulsion. Although they could not give an answer on how 'hedonism' value would (not-)matter in their career, they indicated some of their health symptoms because of fish processing activities.

Box 4.2 Reasons for holding enjoyment and pleasure feelings in fishing; stated by the fishing community

1) Having an addiction to fishing and going into the sea
2) The possibility of securing a bounty catch in one of the voyages to gain a sudden profit
3) Getting to know new people with similar hobbies and concerns
4) Holding a job that feeds the family and enables kids to continue their education
5) Working with other family members in the same job
6) Working independently in the job without having an employer

When it comes to the 'self-esteem' value, male fishers confirmed that it has relatively high importance in fishery through statements similar to the ones in 'hedonism' value (e.g., proud of providing food and education for family members). Some fishermen believed that in order to survive in such a harsh profession, one should derive strength from the positive aspects and feel proud. On the other side, female respondents mentioned that they are grateful for having a source of income, as they can contribute to the economy of the family and be able to socialize with outsiders, but they do not put high importance on holding 'self-esteem' value through their job because they do not feel having the sense of pride due to the 'compulsion aspect' of their job. Furthermore, they stated that their social status is enhanced in comparison to their previous generation, but they still feel socially deprived because of not getting proper education during their childhood.

The 'Novelty' value garnered little importance among male and female members. Although male members mentioned a few alternative methods for fishing like using Styrofoam board (*shol*) (Figure 4.4), both males and females stated that there is no scope for novelty and innovative thinking in the fishery. The common beliefs of the 'good life' value category among male and female members of SSF/DF production in Sagar Island have been briefed in Table 4.3. The responses of the informants have shown that values and beliefs related to 'spiritual wellbeing', 'hedonism', and 'self-esteem' hold different levels of importance for male and female fishing members.

Fig 4.4 Using Styrofoam board (*Shol*) for fishing. A small motor is attached to the bottom part of the board for riding it by overcoming the waves coming toward the shore. A long rope holds the board from the shore and prevents it from getting lost inside the water (Photo: Sevil Berenji).

Table 4.3 Common beliefs related to the 'good life' value category among male and female members of small-scale fishery and dried fish production in Sagar Island

Type of value	Common beliefs among male members of SSF and DF production	Common beliefs among female members of SSF and DF production
Wealth	▪ High economic uncertainty because of unavailability of fish and hence reduction in dried fish production ▪ Economic loss and life risks have increased recently ▪ Some fishers and their family members prefer going on separate boats to increase the chance of profit ▪ Fisher's inability to quit the business because a debt to a local moneylender still exists (*Aratdaar*) ▪ It is a must to search for alternative or part-time jobs ▪ It has been hard to catch fish even with a smaller mesh size ▪ Some fishers shift from having a family business to monthly labor works because of their inability to afford the investment cost needed for fishing	▪ High competition among fishers because of the high number of fishers and low availability of fish per head ▪ Fishers marginally earn the livelihood ▪ Killing the mermaid affects the wealth ▪ Economic status has improved than before

Spiritual wellbeing	▪ Performing *Puja* before each voyage on a boat is a must ▪ Psychological obstruction to catching fish because of actions that could contradict their religion ▪ Enjoying life's blessings despite economic hardships ▪ Worshipping *Ganga Maa* and wearing *Maduli* or *Tabeez* protect the community ▪ Holding religious beliefs like bad luck resulting from killing a mermaid ▪ Need for spiritual help to relieve tensions of the business ▪ Having trust in 'Fate'- '*bhagyo*'	▪ Worshipping *Ganga Maa*, wearing *Maduli* or *Tabeez* to protect husbands and sons working in the sea ▪ Praying to *Ganga Maa* for blessings of safety and good fortune ▪ The story of a mermaid is real, and the community had a big *puja* for it ▪ Lightning strikes only black people in the sea ▪ Sacrificing food to buy gemstones and *Madulis*
Secure livelihoods	▪ Fishers handle livelihood marginally ▪ Relying on the business for the livelihood of upcoming years ▪ Not going on the same boat with family members in order to secure a source of income ▪ Having alternative small-scale businesses (e.g., inland aquaculture, growing paddy and vegetables) or labor jobs (e.g., construction and digging soil) to secure income ▪ Quitting family business and starting labor jobs to avoid going into more debt ▪ There are high tension and uncertainty in life due to the economic risks in fishing	▪ Women who participate in dry fishing have marginal income ▪ Catching fish and shrimps on small boats in the riverside helps livelihood marginally ▪ Daily labor jobs on different government projects through MGNREGA (Mahatma Gandhi National Rural Employment Guarantee Act) has been a good opportunity for many ▪ Lack of any viable job alternative in the region is a big problem ▪ Increasing life risks in fishers because of random cyclones and thunderstorms ▪ Women become worried when they are not aware of the health of family members working in the sea, as small boats do not have GPS and wireless connections or cellphone connections deep in the sea ▪ There is a need for a monthly allowance for elders from the government ▪ Losing the family business can cause psychological disorders
Hedonism	▪ Developed a feeling of fear and hatred towards the water as it takes a lot of fisher lives ▪ Enjoying fishing as a profession and going into the water ▪ Being afraid that life risk will interrupt the continuation of the business ▪ Happy to be in the same business with family members ▪ Suffering in guilt knowing that catching animals (fishing) is outside of the tenets of the religion	▪ Developing a liking towards the job after entering it ▪ Psychological satisfaction for contributing to the income of the family ▪ Very laborious task of fish drying and long sun exposure during it cause dehydration, headache, back pain and hand blisters ▪ Feeling of accomplishment in learning something easy ▪ Feeling compulsion toward continuing it

	▪ Avoid going to the sea for fishing and hiring others instead ▪ Admiring the direct supply of food from their career ▪ Happiness when catching a large number of fish ▪ Fishery brings eyesight and hearing problems, malnutrition and low blood pressure	▪ Being extremely interested in dried fish production because of being involved in it since childhood ▪ Enjoying the chance to meet others and share lives ▪ Finding it thrilling because of the possibility of earning a lot of money in one catch ▪ No women would have been interested in pursuing it if there were no economic challenges in their households
Self-esteem	▪ Proud of providing food and education for family members ▪ Not being empowered through proper education to be able to look for alternative jobs ▪ Proud of one's wife helping with the business ▪ Self-dependence among women has increased recently because of moving outside for work requirements ▪ Women are having a better understanding of their rights in society and family than before ▪ Working independently in the job without having an employer brings a feeling of pride	▪ Socially deprived for having not gotten a proper education ▪ Social status more enhanced than the previous generation who used to sit in the corner of the house throughout the year while not even going out for shopping ▪ Getting the courage to interact with the outside world by entering the business ▪ Proud of contributing to family income ▪ More self-dependent than before
Novelty	▪ Not providing opportunities to be creative in the business ▪ Not going on the same boat with family members to reduce the risk of life loss and economic loss ▪ Having alternative small-scale businesses or labor works in and out of the Island ▪ Using mosquito nets in fishing ▪ Using family members to save on the extra labor cost ▪ Using Styrofoam board (*Shol*) for fishing	▪ No scope for creative thinking while processing the fish ▪ Just thinking about the process and nothing more ▪ Women working in social services dealing with pregnant women and children (i.e., *Anganwadi*: a type of rural childcare center) are more creative when it comes to providing better education and health ▪ Using the concrete embankment for drying fish makes the drying process easier

Note. Data are from semi-structured interviews, focus group discussions, and household surveys answered by small-scale fishers, dried fish producers, and members of Fishermen Association of Sagar Island.

4.2.3 'Personal Virtues' Value Category

The 'Personal virtues' value category is composed of values that are derived from preserving and enhancing the welfare of those with whom one is in frequent personal contact, within the family and other primary groups (see 'benevolence' value in Schwartz, 2012). According to Schwartz

(2012), the high importance of values related to ‘personal virtues’ derives from the centrality of positive and cooperative social relations in the family where the initial and continuing value acquisition of an individual takes place. Values in this category promote the desired righteousness of a person by striving for benevolence, moderation, or honesty. ‘Better world’ value category and ‘personal virtues’ value category both have the tendency of paying attention to the welfare of others, but ‘personal virtues’ values concern the welfare of the in-group whereas ‘better world’ values concern the welfare of all - outside the primary group. The importance hierarchy of 'personal virtues' value types among the fishing community of Sagar Island is represented in Figure 4.5.

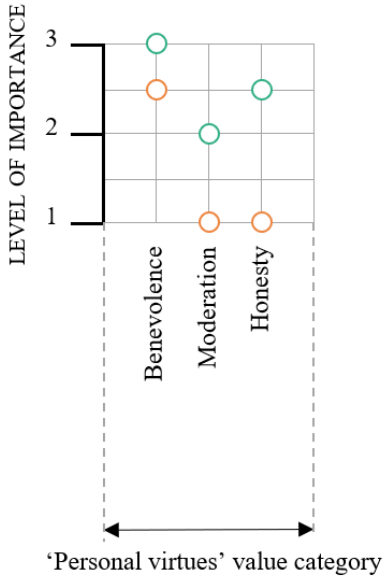


Figure 4.5 Importance hierarchy of ‘personal virtues' value types in the small-scale fishery and dried fish production of Sagar Island based on the male [green] and female [orange] fishers and dried fish producers who judged each value (note that 1 implies ‘not important’, 2 implies ‘somewhat important’, and 3 implies ‘very important’).

Note. Data are from household surveys answered by fishers and dried fish producers of Sagar Island

LEGEND

- Male members
- Female members
- Male and Female members both

Among the ‘personal virtues’ value category, ‘benevolence’ value is perceived as a highly important value among male and female members. During the interview, male members explained the events related to rescuing the lives of fellow fishers or helping each other financially. On the other side, female members stated the importance of emotional and financial supports among the community members. Speaking about ‘moderation’ and ‘honesty’ values, male members declared relatively high importance to them in fishery livelihood by mentioning the damages caused by fishing trawlers and small-scale fishers when they disobey the regulations (e.g., using mosquito nets). Other common beliefs of the ‘personal virtues’ value category among male and female members of small-scale fishery and dried fish production in Sagar Island are shown in Table 4.4.

Table 4.4 Common beliefs related to the 'personal virtues' value category among male and female members of small-scale fishery and dried fish production in Sagar Island

Type of value	Common beliefs among male members of SSF and DF production	Common beliefs among female members of SSF and DF production
Benevolence	▪ There is no possibility of continuing the business without each other's help ▪ Rescuing by fellow fishers when the boat gets flipped ▪ Informing each other about urgent situations ▪ Helping each other emotionally and financially ▪ Wives not being interested in knowing the real economic situation and hardships in the fishing business	▪ Discussing and sharing social and financial issues with co-workers and neighbors is important ▪ Psychological relief of feeling attached and concerned toward each other's lives
Moderation	▪ Not enough catch for a normal livelihood ▪ Being always in debt to local moneylenders (*Aratdaar*) is frustrating and makes fishers disobey the regulations ▪ Fishing trawlers cause more damage than SSF	▪ Not enough catch for dry fish business ▪ Fish drying machine is abandoned due to scarcity of raw material (fish)
Honesty	▪ Illegal fishing nets with smaller mesh size than 90 mm are sold and used in Hilsa season which leads to the catching of immature Hilsa ▪ Using mosquito nets to catch shrimps in the riverside leads to catching other unwanted small fishes ▪ Need financial support from government esp. during the banned periods to ensure better compliance ▪ Compulsion to go to the ocean in spite of adverse weather alerts due to economic necessities	▪ Messy process of drying fish on sand because of not being allowed to dry on concrete embankments (*Chataal*s) ▪ The lands used for drying fish will be usurped by private firms ▪ Being unable to use boats because of the ineffective dredging arrangement made by governments.

Note. Data are from semi-structured interviews, focus group discussions, and household surveys answered by small-scale fishers, dried fish producers, and members of the Fishermen Association of Sagar Island.

Unlike male members, the female respondents have indicated a lower importance to 'moderation' and 'honesty' values. They believed that they are catching a moderate amount of fish anyways because of less availability of fish in the sea; therefore, there is no use of taking 'moderation' value as an important value because that is the new normal. When it comes to integrity in the fisheries governing system ('honesty' value), females were not fully aware of the fishery rules and regulations in the region to make anything out of the value 'honesty'. They stated that they had been merely informed by their employers or family members that they are banned by the

government to perform fish processing on concrete embankments along the shore because of the damages caused by the use of chemicals required.

4.2.4 'Outward Aspirations' Value Category

The values dedicated to the 'outward aspirations' category signifies desired relationship with outer beings that guide interactions with fellow humans or objects outside of self. They are derived from restraining actions and inclinations that might disrupt and undermine group functioning by violating social expectations and traditions (see 'conformity' and 'tradition' values in Schwartz, 2012). Groups everywhere develop some practices, symbols, ideas, and beliefs that represent shared experience and fate in them. These traditions symbolize the group's solidarity, express its uniqueness, and contribute to its survival (Durkheim, 1912/1954; Parsons, 1951). During field work, it has been found that the current problems in the income and debt of fishing community have been one of the main drivers for the individuals to continue the fishing tradition and stay attached to the place. Moreover, these challenges have led the community to subordinate the potential religious or caste discriminations and have built high social cohesion and unity within community members. The importance hierarchy of 'outward aspirations' value types among the fishing community of Sagar Island is represented in Figure 4.6.

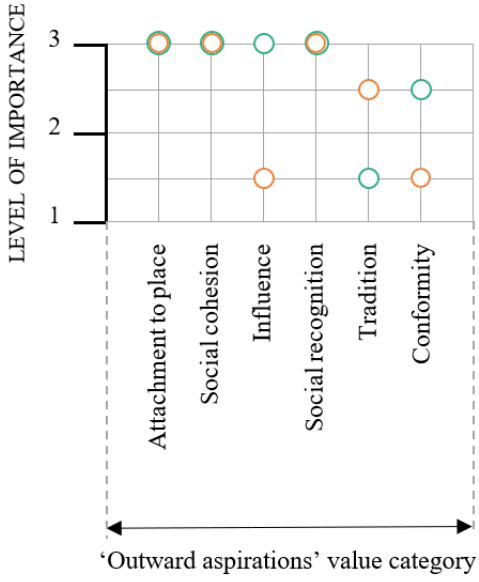


Figure 4.6 Importance hierarchy of 'outward aspirations' value types in the small-scale fishery and dried fish production of Sagar Island based on the male [green] and female [orange] fishers and dried fish producers who judged each value (note that 1 implies 'not important', 2 implies 'somewhat important', and 3 implies 'very important').

Note. Data are from household surveys answered by fishers and dried fish producers of Sagar Island

LEGEND

- Male members
- Female members
- Male and Female members both

'Attachment to place', 'social cohesion' and 'social recognition' values were judged to be the highest in terms of importance among both male and female fishing members of the Island. The top status of these values can be exemplified by respondents' explanations such as "this is the main

factor of fishery survival in this place" and "this is the most wanted thing for all of us". Participant observations and semi-structured interviews reveal that fishery of the island has been a 'character of the community' and that all other practices, ideas, identities, values and beliefs take shape based on it. As Brookfield et al. (2005) conclude, "fishing is the glue that holds the community together" and "the community understands and makes sense of the world from a perspective that is garnered from years of involvement with the fishing industry" (p. 56). Therefore, no wonder why members in the island see fishery as an inseparable part of their lives and demand greater public recognition for fishing work. The importance hierarchy shows the 'attachment to place' value as one of the most important values as a contributing factor to the fishery of the island. Jacob et al. (2001) suggest that strong attachments to fishing support the sense of belongingness in a region. This would be one reason as to why members perceive 'social cohesion' as an extremely important value. High importance towards 'social cohesion' gets reflected through the existing harmony within the community among the followers of different faiths.

Throughout the Sundarbans' history, Muslims have been respectful to *Maa Ganga* - a Hindu goddess (Figure 4.7: left), and same way Hindus have shown theirs towards *Bonbibi*'s Muslim parentage (Figure 4.7: right). The rich tradition of syncretism (the combination of different religions, cultures, or ideas) has a long history in many parts of India, and Bengal is no exception to it (Chacraverti, 2014). However, the fact that the Sundarbans' syncretism has been successful in achieving the union among its subjects is even more interesting. Through the interviews and discussions in the field, it has been found that the community's economic uncertainties, challenges and problems have led them towards positives such as strong union and solidarity. As mentioned previously in Section 4.2.1, they have found that to overcome the current challenges, they need each other's support. A fisherman's explanation regarding the importance of high social cohesion in the fishery is as follows:

> *In this business [fishing], the economic uncertainty and the need to work together are the most important traits. So, there is no scope for religious discrimination among co-workers from different religions. We are facing the same difficulties during fishing. We do not get any special help from the government. Of course, we need to help each other!*

(Male, Former fisher and current dried fish producer)

Figure 4.7 The idols of *Ganga Maa* (goddess of Ganges) [left] and *Bonbibi* (goddess of the forest) [right] (Photo: Sevil Berenji).

There is a remarkable difference in prevalence of the 'influence' value between male and female members. Male members ranked 'influence' as one of the most important values in the fishery by explaining the essentiality of leadership in fishery management. The majority of females did not perceive the high importance of 'influence' value because most of them stated that sense of leadership could not be an important part of their fishery activity as they can be paid without any leadership role (most of female informants are daily wage laborers). Male members believed that strong leadership and a decision-making process should be well managed both in society and in households. These kinds of gender differences (e.g., excluding women from meaningful participation) are the outcome of the prevailing patriarchal and patrilineal structures, institutions and practices (that hold patriarchal rules, norms and perceptions) in Sundarbans where the activities are mainly controlled by men and the properties are mainly owned by men. This mechanism makes the women second-class citizens, submerges the social leadership potential in women and leads to inconsistent values among male and female members of a society.

It was observed that being a business owner or a crew member does not change the perception of males in the importance of the 'influence' value. Crew members explained the direct impact of leadership in fishery management on their income as they are paid according to the amount of catch, rather than in the form of the daily or monthly wage. Business owners articulated

a clear sense of leadership. One fishing business owner explained:

> *Although I consult with my wife and elder son in decision making, I am the one who takes the decision at the end. Males manage this business mostly, and women like my wife and daughter-in-law help the business. Their help provides extra safeguard to the financial situation of the family as the money required for hiring labor for fish processing gets saved.*

(Male, Fishing and DF production business owner)

The constant dangers to assets and lives mainly due to sudden changes in weather conditions and flourishing industrial fishing in the area have changed people's belief regarding the future of the fishery and the importance of transferring their fishing skills to the next generation. Male fishers stated that the number of fishers had increased recently; therefore, the fishery in the region is suffering from the high number of fishers and a reduced pool of catch. As a result, male fishers do not give high importance to the 'tradition' value because of an insecure future for younger generations when it comes to the fishery. This could imply that the tradition of transferring the family business from one generation to the next is losing the centrality that may have existed sometime in the past among the fishing community. Among male respondents (n=25), 60% of them did not want their kids to continue the business mainly because of high life risk and economic uncertainty. Only 23% of them, mostly family business owners, wanted their next generation to continue the business, and 17% declared that they are open to whatever their kids prefer. On the other hand, 'tradition' was strongly desirable for female members. They stated that involvement in dried fish production has made them socialize more with society and has further enhanced their chance of getting a proper education. It shows that dried fish production in the island has indeed broken up some patriarchal traditions in the society. Female members illustrated their high rank to the 'tradition' value by stating that many young women are taking an interest in tradition of post-fishing activity through statements such as:

> *Our social status has improved a lot compared to the generation of our mothers and grandmothers. Earlier, there was no chance of getting the education for women, and they used to sit at the corner of the house throughout the year. But now we can go outside and participate in dried fish production. This also gives us an opportunity for social interaction with the outside world. Therefore, young women get the interest and courage to start this profession.*

(Female, Dried fish producer)

Table 4.5 Common beliefs related to the 'outward aspirations' value category among male and female members of small-scale fishery and dried fish production in Sagar Island

Type of value	Common beliefs among male members of SSF and DF production	Common beliefs among female members of SSF and DF production
Attachment to place	▪ Not being able to leave the business without paying off the debt to local moneylenders (*aratdaar*) ▪ Stuck with the profession due to a lack of viable job alternatives or land for farming ▪ No other skills to shift business or location ▪ Affecting the next generation because of ongoing debt ▪ The island is the motherland and part of one's identity ▪ Business owners are responsible for the livelihood of hired workers and their families ▪ "Boats are like agricultural lands for us" ▪ "No other addiction more powerful than fishing"	▪ Attachment to the place where neighbors and co-workers are living and working ▪ Not being able to change land and profession because of a lack of education ▪ Having in the blood to continue the profession and stay in the motherland ▪ The profession is a way of life for fishers ▪ Responsibility to paying off the debt to local moneylender (*aratdaar*) attaches a person to the place
Social cohesion	▪ Stay connected with community members as a family despite caste and religious differences ▪ Standing beside each other during an emergency as members would when worshipping	▪ Learning the business from co-workers is precious ▪ Harmonious relation with co-workers while sharing family and work-related issues with them is an important aspect ▪ Helping each other during an adverse situation ▪ There is no discrimination among each other
Influence	▪ Learning the techniques of managing the business since childhood from the parents ▪ Not interested in having fishing trawlers as it is a big amount of responsibility and it negatively impacts the environment ▪ Being responsible for paying hired workers fairly and taking care of their families ▪ Women are not brave enough yet to accompany husbands on boats ▪ In the future, women will take the leading role of fishing as a result of getting more experience in the business day by day	▪ Harder for women to go fishing due to physical features ▪ Taking the lead in hiring women labors to work on dry fishing is satisfactory ▪ There is a fear of going to the water ▪ Significant leadership role among women in worshipping *Bonbibi*

Social recognition	▪ Fishers lack the ability for socializing with the outside world because of that lack of social and educational skills ▪ "We are like a colony which is almost non-existent to other classes of society. Our existence does not matter to others." ▪ Coast guards deny SOS signals of boats when the waves are more than 3m high ▪ Issuing biometric i-card for coastal residents after many coastal residents went missing in 1999 super-cyclone of Odisha ▪ Issuing marine fishers i-card from the ministry of agriculture for those going deep into the sea for fishing	▪ Lacking the social ability to interact with outsiders ▪ "If the economic condition does not change, no other social and mental changes are going to be possible."
Tradition	▪ Learning the techniques during childhood from parents ▪ The business is a family tradition ▪ Not being able to find any job in other sectors in spite of being educated ▪ The compulsion of getting into the profession due to economic reasons ▪ Everyone can decide freely to choose any profession after getting a proper education ▪ There is a decent life guarantee for next generations in this business ▪ Uncertainty in the future of the business	▪ Hard to follow the business for a younger generation due to severe life and health risks ▪ Unable to choose a different career path due to not being educated ▪ Being trained for many years in the family and community makes it a family business ▪ Involving in DF production makes younger women to become more socialized and educated
Conformity	▪ Reviewing regulations by considering the community's needs and ideas for better responses to rapid changes ▪ Inquiry regarding stopping the practice of fishing trawlers or at least implementing limits in time or speed or area of operation ▪ The availability of fish was worse before and many fishers abandoned fishing because there was no 61-day ban period ▪ Requests for the officials to directly supply the government aid to the fishers via the local Fishermen Association instead of passing through *Panchayat* which results in an unnecessary delay ▪ Government officials do not realize the actual problems since they don't go directly to the ocean for fishing	▪ There is a demand for allowance during the off-season/fishing ban period ▪ Few platforms for drying up the fish, restrooms on the riverside, and a fish market could be established along the riverbank ▪ Banning concrete embankment for drying fish makes the fish processing messier and harder

Note. Data are from semi-structured interviews, focus group discussions, and household surveys answered by small-scale fishers, dried fish producers, and members of Fishermen Association of Sagar Island.

‘Personal virtues’ and ‘outward aspirations’ value categories both promote cooperative and supportive social relations. However, ‘personal virtues’ value category provides an internalized motivational base for such behavior whereas ‘outward aspirations’ value category promotes cooperation (Schwartz, 2012). Table 4.5 exposes the common beliefs of the ‘outward aspirations’ value category among male and female members of small-scale fishery and dried fish production in Sagar Island.

4.3 Contributions of SSF and DF Production to Status of Values and Beliefs

Fishing has long been a key industry in the Sundarbans and a prominent part of Sagar Island’s history. However, a general downward trend in catch volume in recent years has raised concerns about the sustainability of the small-scale fishery. We can no longer ignore the contributions this fishery makes to the values and beliefs in different fishery stakeholder categories. The differences in values and beliefs of stakeholder groups, as well as variation within groups, are some of the crucial impediments in resource conservation planning and implementation processes (Dietz et al., 2003; Vennix, 1999; Wondolleck & Yaffee, 2000). Table 4.6 shows how each corresponding group has received certain benefits from the fishery (growth of values and beliefs), as well as simultaneous compromises been made (erosion of values and beliefs).

In this section, an analytical study of positive and negative contributions of Sagar Island’s small-scale fishery (SSF) and dried fish (DF) production to values and beliefs have been articulated. This approach displays SSF and DF production contributing from multiple angles, namely, ‘objective’, ‘subjective’ and ‘relational’ dimensions that are stemmed from the social wellbeing approach (see Coulthard et al., 2011). Moreover, this approach links the diverse contributions with the notion of diverse social values derived from a value inventory compiled in Song et al. (2013). Consequently, the diverse contributions of SSF and DF production in the social-ecological system of the island can be systematically understood through three major actor groups. Listed in the order of increasing social scale, the categories include fishers and dried fish producers themselves, the fishing village/wider community in which fishery and dried fish production are enclosed, and the greater society to which fishery and dried fish production draw an overarching cultural or political connection (i.e., regional or national government or the general public of the country).

Table 4.6 Contributions of SSF and DF production to values and beliefs of fishers/dried fish producers, fishing community, and the greater society (Deemed positive '+' to the growth of relevant values and beliefs of the corresponding group, and negative '−' to the erosion of relevant values and beliefs of the corresponding group) in the case of Sagar Island

Dimensions of Values	Fishers/Dried fish producers		Fishing village/Community		The general public/Government	
	Relevant values	**SSF & DF contributions**	**Relevant values**	**SSF & DF contributions**	**Relevant values**	**SSF & DF contributions**
Objective	**GL:** Economic wealth, Livelihood	Crucial livelihood support for fishers and dried fish producers (+,−); Insignificant source of income for crew members and daily laborers (−); High market price of Hilsa fish (+); Low ability to pay off the debt to moneylenders (−); Low quality and the low market price of boats (−); Low accessibility to rescue alert technology in small boats (−)	**GL:** Community-wide economic wealth, Livelihood	High economic and nutritional values staying in the island and reaching non-fisher residents (+); Decrease in the amount of catch per person because of the increase in the number of industrial fishing trawlers (−); Weak access to other lands and main markets (−); Undefined space for fish processing (−); Not being entitled to quota (reservation) because of not being among Scheduled Castes and Scheduled Tribes (−)	**GL:** Macro-level wealth (export or industry value) **BW:** (scientific) Knowledge	India is the second/third largest fish producer in the world (+); Fish production of West Bengal state is ranked first nationally (+); Low number of scientific studies on small-scale fishery and dried fish production of the region (−)
Subjective	**PV:** Identity, Moderation **GL:** Achievement, Spiritual/religious value, Hedonism, Self-	Fishery perceived as a business activity embedded in the wider community than an individual business (+,−); A multitude of feelings for fishing work such as (dis-)satisfaction, pride and hope observed in	**OA:** Tradition, Cultural sustainability, Attachment to place	Dried fish production is seen as a nuisance in the village especially with a preservative chemical smell and messiness caused by sand (−); History of holy Ganges river forming part of community identity (+);	**GL:** Pleasure, Hedonism, Novelty	Consumption moderately or highly enjoyed by the West Bengali people (+); Usually taken as a delicacy and treat (+)

	actualization **BW:** Freedom	fishers and dried fish producers (+,−); Evolving diverse faiths such as developing of trust in 'Fate' – '*bhagyo*' (+,−)		A multitude of feelings and reasons for (not)belonging to the place (+,−); Feeling of socially deprived and marginalization from wider society (−)		
Relational	**OA:** Conformity, Obedience, Affection **PV:** Benevolence	Building camaraderie and sharing of information exists among fishers but either inoperative or limited to intimate circles (+,−); Sympathy for fellow fishers going bankrupt together with anxiety for the future conditions of the fishery (−)	**OA:** Social cohesion, Sense of belonging **BW:** Equality, (local ecological) Knowledge	Creates strong momentum in bringing the community together (+); Separation for a long time from the village for fishing purpose cooperative further limits connectedness with the village life (−); High social cohesion in the community without caste and religious discrimination (+); Low ecological knowledge of the community especially in women (−)	**OA:** Social recognition, Public image, Influence, Social power, Security, Social order **BW:** Peacefulness	Perceived as a sector declining and somewhat irrelevant in the wider cultural and religious discourses and in the policy circle (−); Government recognizes its role in supporting coastal villages and infrastructure, although weak in practice (+,−); Weak cooperation among fishers and fishery organizations (−); Strong relationship between Fishermen Association and fishers for ensuring the wellbeing of fishers (+)

Note. **BW**: Better World value category; **GL:** Good life value category; **PV:** Personal Virtues value category; **OA:** Outward Aspirations value category

Data are from semi-structured interviews, focused group discussions, and household surveys from small-scale fishers, dried fish producers, and members of Fishermen Association of Sagar Island.

The findings of the analysis have been summarized and displayed in Table 4.6, above. The content of each dimension should not be seen as a strict association, as each contribution will also have connections to the other dimensions of wellbeing. The list shows the potential of the social wellbeing framework to address issues of values and beliefs that are not just social and cultural in nature but relate to other disciplines as well.

4.3.1 Objective Dimension

The objective dimension typically includes an economic or livelihood option derived from fishery and dried fish production. 'Knowledge' value that appears in the form of scientific knowledge related to the fishery or dried fish production can also be considered a part of the objective values as it carries essential information for the broader society. However, local ecological knowledge could be of value to a fishing community in terms of promoting relational ties between community members (Johnson et al., 2018). Fishing in India is a major and lucrative industry in its coastal states. Considering the amount of money involved and fishers' high dependence on the fishery of Sagar Island for their livelihoods, the effect of a poor fishing season may potentially be too much to overcome, forcing some fishers to exit the fishery itself. The prevailing view is that small-scale fishing business is nearing collapse with perhaps just enough resources left for the survival of the current generation. One fisher aptly explained:

> *We are small-scale businesspeople. If fish, especially Hilsa, shows such poor frequency in one season like this year, we would face massive pressure in cash flow because of our inability to pay off our debts to local moneylenders. Just think how we are suffering by considering that we have difficulty in paying off our debts even when the season brings us a good amount of fish.*

(Male, Fishing business owner)

Reported deteriorations in the objective dimension of fishery's contributions, as shown in the above table for individuals as well as community, are the result of insufficient income and lack of access (transportation) to main markets. These deterioration processes have reverberated into decreased access to store-bought foods, construction materials and financial capital for initiating livelihood diversification. Also, they have trapped the majority of the respondents (95%, n=45) into debt to local moneylenders. If we focus on the positive side, however, the lack of decent connectivity of the islanders with the mainland has ensured that most of the fishing products rich in nutritional value will stay within the island, benefitting even non-fisher residents (Figure 4.8). Such processes have resulted in the re-shaping of values in the objective dimension, modifying

people's needs, desires and aspirations.

Figure 4.8 Small shrimps and fishes caught in the riverside mostly by mosquito nets, get separated and sold to local people regularly (Photo: Sevil Berenji).

4.3.2 Subjective Dimension

Subjective dimension embodies the actors' own perceptions and how they feel about the fishing and dried fish production. Fishing and dried fish production in Sagar Island is generally structured and seen as something embedded in the wider community rather than being an individual business activity. For instance, fishers negotiate the terms of fishing directly with fellow fishers and the Fishermen Association instead of going directly to the government.

One key measure of related values in this dimension for fishers and dried fish producers would be self-actualization in their work (e.g., job satisfaction as one of its more specific forms); that is, how they internally find merit in their occupation in a manner that adds to their subjective wellbeing. Varying degrees of approval and hope for the fishing work were observed from the interviewees' responses. One owner of a small boat in his late 40s with 25-years' experience in fishing shared a pessimistic and helpless view:

> *I do not want my grandkids to come into this profession because of the life risk and the amount of labor that is required. I want them to get a proper education and choose their own separate profession. But then I am also not sure if they will be able to apply their choices considering the number of debts we have to the local moneylender. I think it will take at least three generations to pay it back completely.*

(Male, Fisher)

On the other hand, a positive and hopeful version about working in the fishery was voiced by

another owner of a fishing unit in his mid-20s:

> *I think there is no other addiction more powerful than fishing. There is always hope of getting more fish. Even if we catch only one fish for a day, there is the hope of getting more the next day. Look! One-time good catch means 5 to 10 lakhs (INR) of value, and sometimes it goes up to 25 lakhs (INR) [~USD 7,000 – 25,000].*

(Male, Fisher in Kerala and Sagar Island)

Another important facet of the fish and dried fish value chain is its consumption by the general public. By incorporating the 'pleasure' value, this dimension acknowledges one notable contribution of the fishery and dried fish production towards the overall consumer audience. Fish has a special place in Bengali culture and cuisine from old ages. Fish especially Rohu (*Rui*), Hilsa (*Ilish*) and Pomfret (*Pomfret*) are sought-after foodstuff in West Bengal (Figure 4.9).

The constant threat posed to assets and lives because of continuous exposure to sudden weather changes and cyclones had strengthened people's need to seek divine protection. One interesting aspect of the Sundarbans' gods and goddesses is that these deities are not the regular godheads of India. They are the specific deities of people who are highly natural resource-dependent: boat builders, woodcutters, honey gatherers, cultivators, and fishers. In fact, battling with the uncertainties and unexpected events in a harsh nature of the Sundarbans has been so overwhelming for them that it has led to the creation of completely localized deities to whom they could seek psychological refuge during difficult times.

The shared experience of fishers/dried fish producers regarding the decline in the number of catch and its impact on livelihood is likely to have produced new values and beliefs in them. For instance, during interviews and casual conversations, the fishers and dried fish producers never referred to the religious element in their lives unless in response to a specific query. This could imply that the traditional rituals and beliefs are losing the centrality that the fishing community may have enjoyed some time in the past (Chacraverti, 2014). They have started to believe that divine powers cannot change their fate.

An interesting aspect of local belief I find is the two versions of trust they put in their 'Fate' - '*bhagyo*' as some fishers call it (literally meaning 'fate' in Bengali). As for some fishers, fish catching and protection against hazards are a matter of '*bhagyo*' (a belief that a person's whole life is dependent on his/her fate, whether good or bad). While other batch of believers emphasized that they continue to pray to gods and goddesses, especially *Ganga Maa* for the sake of being blessed with good fortune.

Figure 4.9 Typical Bengali fish meal served in a local restaurant of Sagar Island; containing rice, shredded and fried potatoes (*aalu*), boiled vegetables, crackers (*papadum*), legume soup (*dal*), and fried fish (*machh bhaja*) or fish curry (*machher jhol*) (Photo: Sevil Berenji).

4.3.3 Relational Dimension

Relational dimension pays attention to the contributions made through social relationships and interactions with others. Coastal places are the hotspots where natural and human processes intersect through the physical manifestations of fishing and the cultural meanings, practices and emotions linked to marine environments. In other words, fishing is a transformational activity generating relational networks linking marine and terrestrial environments (Johnson et al., 2018).

Small-scale fishers and dried fish producers in Sagar Island have long been organizing themselves to nurture obedience to social norms and unification, as well as to provide support for each other by concentrating on existing mutual problems rather than potential religious or caste discriminations. More formally, the Fishermen Association in the village (Figure 4.10) has been one of the main vehicles raising the prevalence of a collective mode of the fishing operation. The association having fishers and dried fish producers as its main members is open to every fishery household of Sagar Island. It works as a medium between fishers and the government representatives in addition to organizing cultural programs and religious ceremonies for the community.

Situating the Sagar Island fishery in the context of the greater India society, fisheries in India are generally perceived as a sector that is improving. However, among the primary industries, the small-scale fishery sector appears to occupy the lowest rung of the social ladder due in part to

the Indian caste system and other to the perception of harshness and lack of sophistication in the nature of fishing. At the same time, a persistent but inconspicuous government mandate on supporting small-scale fisheries is being maintained - rhetorically and materially. As a result, social deprivation caused by a lack of sufficient social recognition can be clearly seen among the fishers and dried fish producers. A male fisher in his late 50s described the situation by using a metaphor:

> *I think that we [fishing community] are like a colony which is almost non-existent to other classes of the society. Our existence does not matter to others.*

(Male, fisher and dried fish producer)

It has been noticed that in spite of the reduced availability of fish in the region, less income has created the strong sense of benevolence and momentum in bringing the community together by easing out caste considerations and religious differences. It has been reported that sharing religious rituals in the same physical space leads to a feeling of solidarity among community members. On the other side, deteriorating mental health, which includes anxiety and depression among individuals, has been observed in the regions associated with the scarcity of local resources.

Figure 4.10 Poster dedicated to 'Fishermen Association of Sagar Island' with the depiction of Goddess of Ganges (*Ganga Maa*) is used during the local meetings (Photo: Sevil Berenji).

4.4 Chapter Summary and Conclusion

In this chapter, the value scheme suggested by Song & Chuenpagdee (2015) and Song et al. (2013) has been used as the reference for evaluating values and beliefs among the fishing community of Sagar Island. Data collected from semi-structured interviews, focused group discussions, and household surveys indicate that a wide range of values and beliefs are important in the Island. Fishers and dried fish producers ranked the importance and stated their perceived meaning of

twenty distinct values by revealing the dynamics of conflict and congruence among the values (Sec 4.2). The findings reveal the perceived contribution of values and beliefs to the SSF and DF production of Sagar Island. Wealth, secure livelihood, attachment to place, social cohesion, and social recognition have been found to be the most important values among male and female fishing members. It has been interesting to perceive that increasing life and economic risks in the island cause high social cohesion among fishing members, rather than leading to social marginalization because of the difference in caste and religious identities.

Schwartz (1970) states that universalism and benevolence values such as 'ecosystem conservation' contradicts with power and hedonism values such as 'wealth'. The fishing community, especially male members, perceive the high importance of both values in the fishery of the region. Therefore, these two values could conflict with each other as seeking dominance for self (e.g., power values) would tend to obstruct actions aimed at granting equality to others (e.g., universalism values). The responses of the informants have shown that the recently growing number of life loss and economic loss made them realize the need of ecosystem conservation in their fishing community. We should be aware that this incompatibility of values could contribute to lower governability in the fishery resource of the region.

A comprehensive table has been introduced through which the diverse potential contributions (positive and negative) of SSF and DF production on values and beliefs in three stakeholder groups can be systematically understood (Sec 4.3). We found out that while small-scale fishery could also be of positive value to the community through the 'social cohesion' and 'sense of belonging' it motivates, it is possible that fishery could negatively affect the community by invoking individual competition. The lesson here is that perhaps careful attention to all three types of contributions and diverse values and beliefs would be a better strategy to deal with the complex reality of the society (Johnson et al., 2018). Although objective contributions are invariably important to securing sustainable livelihoods of fishing communities, so are the subjective and relational ones.

CHAPTER 5

Key Drivers of Value and Beliefs in Small-scale Fishery and Dried Fish Production

5.1 Introduction

Having discussed some of the collectively held values and beliefs and their meanings in chapter 4, this chapter presents the findings for objective two of the present thesis (Box 5.1) by exploring the evolution of values and beliefs. This analysis requires defining the key drivers and crucial changes in social-ecological system of Sagar Island that would impact values and beliefs (Sec 5.2). These relationships are vital in understanding how values and beliefs are shaped among small-scale fishers and dried fish producers of Sagar Island.

Box 5.1 Review of research objectives

> 1) Identify the diverse values and beliefs and their meanings that are hidden in the small-scale fishery (SSF) and dried fish (DF) production community groups;
>
> **2) Define the key drivers that have affected the values and beliefs of community groups**; and
>
> 3) Examine how the values and beliefs of community groups are connected to their social wellbeing (i.e., material, subjective, and relational wellbeing)

The information gained from the discussions and secondary sources of information are used to understand how a small-scale fishery in the social-ecological system (SES) of the Indian Sundarbans has been influenced by drivers at multiple levels, resulting in a range of impacts that affect the values and beliefs of fishers and dried fish producers (Sec 5.3). The social-ecological system of the Indian Sundarbans and the communities falling under its direct influence are under pressure from multiple drivers of change and these drivers are threatening the whole survival of SES system. Aggregation of multi-level and diverse distal drivers (fundamental factors) could cause proximate drivers (actions at the local level) to be represented during the social-ecological regime shift of a place. The proximate drivers would leave a positive or negative impact on the SES and affect the values and beliefs that existed in the system (Figure 5.1). Also, as values underpin decisions and behavior (Satterfield, 2001), there is potential for exploring the role of human values and beliefs as a driver of change within an SES or as an influence on known drivers.

This is consistent with the view that in a SES, human systems and ecological systems are inextricably linked: people rely upon resources provided by ecosystems, and people's decisions and behaviors influence ecosystems in return (Chapin et al., 2009).

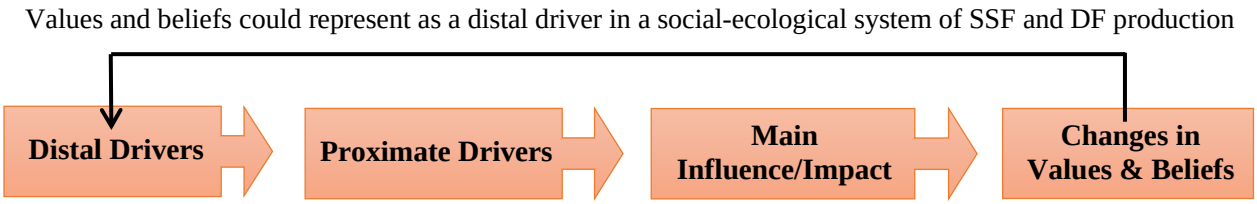


Figure 5.1 Linkages among distal and proximate drivers and the impact on the values and beliefs

The Sundarban region is one of the most impoverished and most isolated areas of both India and Bangladesh. A combination of natural and social factors has created a circle of poverty that is difficult to escape. In the interviews conducted, most fishers and DF producers complained of the lower amount of fish caught. However, the reasons they attribute to this are many and diverse, including the entry of fishing trawlers, which sometimes violate territorial waters. There is a belief among the fishers in the Indian Sundarbans that the quality of water, wind direction, and seasonal changes have also caused the migration and/or extinction of some varieties of fishes, especially Hilsa.

5.2 Distal and Proximate Key Drivers of Values and Beliefs

Béné et al. (2007) point out that poverty among fishery-dependent communities is not necessarily related to the resources or catch amounts, but instead is a product of various factors such as inadequate services, low levels of education, and political awareness. During the field work, the secretary of the Fishermen Association explained that the social-ecological system in the Sundarbans has experienced a gradual but significant shock over the last two decades with the arrival of fishing trawlers in the Bay of Bengal region from neighboring countries like Malaysia, Thailand and India itself. The intervention brought dramatic changes to the overall social-ecological balance of the island. While the fishing trawlers became an instant driver of change, their effects were multiplied by the recent environmental changes.

Sagar Island is currently experiencing significant environmental and social changes caused by a variety of multi-level drivers. Social-economic and political practices that operated through the impact of multiple drivers at different scales have extended and deepened the risks and

consequences of poverty in the area. Social-ecological systems start to show signs of collapse when the existing rules, norms, value systems, and terms of interaction between people and within the ecosystem become dysfunctional (Nayak et al., 2014). The drivers may be natural or human-induced factors that directly or indirectly cause a change in the system (MEA, 2005), the outcomes of which may be positive or negative depending on the drivers themselves and how they display in values and beliefs. Nayak and Berkes (2014) declare that the effects of drivers are a two-way process. In essence, global drivers impact the sustainability of local and regional social-ecological systems. At the same time, sustainability at a global scale also gets affected by changes at the level of local and regional social-ecological systems.

The values and beliefs in the island are influenced by distal and proximate drivers operating at multiple scales. To better understand and analyze values and beliefs, it is crucial to differentiate the sources and outcomes of drivers in SES. As shown in Table 5.1, each of the proximate drivers of SE regime shifts may be influenced by a combination of distal drivers at different scales in the social, institutional, economic, political, and ecological arenas, while also contributing to an equally diverse set of impacts. Drivers determine when and how social-ecological systems become vulnerable (Nayak & Armitage, 2018) to impact values and beliefs. The chapter uses proximate drivers (actions at the local level) and underlying distal drivers (fundamental factors) to explain the various social-ecological regime shifts in the island and their role on values and beliefs among the community. It is important to note that the values and beliefs that are impacted within a SES under a proximate driver should not be necessarily limited to the ones represented in Table 5.1.

Sagar Island draws attention to several key factors and processes that have influenced the social-ecological system, and hence impacted values and beliefs in the region. For instance, factors influencing shifts in the systems have included policy (e.g., fishery conservation approaches in the Sundarbans), market (e.g., price of fish), technology (e.g., the arrival of fishing trawlers), and economy (e.g., the export of seafood) as key distal drivers of change. The diverse distal drivers have impacted the proximate drivers of SES regime shifts which have brought various impacts in the system itself. This system includes both the social subsystem (e.g., access, use and property rights regime, livelihoods, institutions and cultural identity) and ecological subsystem (e.g., salinity regime, water quality, food webs, species composition and habitats). The impacts of the drivers and the resulting changes have led to many social concerns and questions about equity and justice issues. For instance, lower class and economically marginalized fishers in Sagar Island have

Table 5.1 Multi-level distal drivers and proximate drivers of social-ecological regime shifts in SSF and DF production of a place with their associated values and beliefs

Distal Drivers and Their Scale/Level	Proximate Drivers	Main Influence/Impact	Relevant Values
Local: Economic, Social structures; **Regional:** Economic, Social structures; **State/ National/ Global:** Market	Economic exclusion (Sec 5.3.1)	Economic (livelihoods); Institutional (decision-making); Political (disempowerment, identity); Ecological (human-environment disconnection); Social (human-human disconnection)	**Obj:** Economic wealth, Livelihood, Community-wide economic wealth, Livelihood, Macro-level wealth (export or industry value), (scientific) Knowledge **Rel:** Conformity, Obedience, Affection, Benevolence, Social cohesion, Sense of belonging, (local ecological) Knowledge
Local: Social stratification & norms; **Regional:** Social stratification & norms	Social marginalization (Sec 5.3.2)	Social (inequity, injustice, human-human disconnection); Political (disempowerment, identity); Institutional (decision-making)	**Sub:** Identity, Moderation, Achievement, Freedom, Spiritual/religious value, Hedonism, Self-actualization, Tradition, Cultural sustainability, Attachment to place, Pleasure, Hedonism, Novelty **Rel:** Conformity, Obedience, Affection, Benevolence, Social cohesion, Sense of belonging, (local ecological) Knowledge, Social recognition, Public image, Influence, Social power, Security, Peacefulness, Social order
Local: Economic, Social structure; **Regional:** Economic, Social structure; **State/ National/ Global:** Market	Class exploitation (Sec 5.3.3)	Economic (inequity, profit, occupational displacement); Social (divisions and rigid stratification); Ecological (pressure on existing resource and overexploitation); Political (identity, the emergence of the ruling class, human rights)	**Obj:** Economic wealth, Livelihood, Community-wide economic wealth, Livelihood, Macro-level wealth (export or industry value), (scientific) Knowledge **Sub:** Tradition, Cultural sustainability, Attachment to place **Rel:** Conformity, Obedience, Affection, Benevolence, Social cohesion, Sense of belonging, (local ecological) Knowledge, Social recognition, Public image, Influence, Social power, Security, Peacefulness, Social order
Local: Politics & power structures; **Regional:** Politics & power structures; **State/ National/ Global:** Politics & power structures	Political disempowerment (Sec 5.3.4)	Political (disenfranchisement, disempowerment, identity); Institutional (decision-making, political voice and platform); Cultural (loss of identity); Social (disintegration and conflicts)	**Sub:** Identity, Moderation, Achievement, Freedom, Spiritual/religious value, Hedonism, Self-actualization, Tradition, Cultural sustainability, Attachment to place, Pleasure, Hedonism, Novelty **Rel:** Conformity, Obedience, Affection, Benevolence, Social cohesion, Sense of belonging, (local ecological) Knowledge, Social recognition, Public image, Influence, Social power, Security, Peacefulness, Social order

Local: Management practices; **Regional:** Management practices; **State/ National/ Global:** Market, Climate State, Policies	Environmental change (Sec 5.3.5)	Ecological (resource degradation, human-environment disconnection); economic (decline in productivity and fisher income); Cultural (loss of environment as cultural capital); Political (politics of conservation and development, identity, power)	**Obj:** Macro-level wealth (export or industry value), (scientific) Knowledge **Rel:** Conformity, Obedience, Affection, Benevolence, Social cohesion, Sense of belonging, (local ecological) Knowledge, Social recognition, Public image, Influence, Social power, Security, Peacefulness, Social order
Local: Management practices, Social norms, Institutional rules; **Regional:** Management practices, Social norms, Institutional rules; **State/ National/ Global:** Market, Climate, Policies	Ecological marginalization (Sec 5.3.6)	Ecological (environmental justice, human-environment disconnection, identity); Social (inequity, injustice, human-human disconnection); Political (disempowerment, identity); Institutional (decision-making); Cultural (identity)	**Sub:** Tradition, Cultural sustainability, Attachment to place **Rel:** Conformity, Obedience, Affection, Benevolence, Social cohesion, Sense of belonging, (local ecological) Knowledge, Social recognition, Public image, Influence, Social power, Security, Peacefulness, Social order
Local: Politics & power structures, Social stratification & norms; **Regional:** Politics & power structures, Social stratification & norms; **State/ National/ Global:** Politics & power structures	Loss of identity (Sec 5.3.7)	Social (inequity, injustice, human-human disconnection); Political (disempowerment, identity); Institutional (decision-making); Cultural (identity)	**Sub:** Identity, Moderation, Achievement, Freedom, Spiritual/religious value, Hedonism, Self-actualization, Tradition, Cultural sustainability, Attachment to place **Rel:** Conformity, Obedience, Affection, Benevolence, Social cohesion, Sense of belonging, (local ecological) Knowledge, Social recognition, Public image, Influence, Social power, Security, Peacefulness, Social order
Local: Economic & production, Conflicts & contestations; **Regional:** Economic & production, Conflicts & contestation; **State/ National/ Global:** Market, Governance policies	Fishers' disconnection from resource and other fishers (Sec 5.3.8)	Ecological (human-environment disconnection); Social (human-human disconnection); Political (loss of access, rights, entitlements, knowledge and ownership)	**Obj:** Community-wide economic wealth, Livelihood, Macro-level wealth (export or industry value), (scientific) Knowledge **Sub:** Tradition, Cultural sustainability, Attachment to place **Rel:** Social cohesion, Sense of belonging, (local ecological) Knowledge, Social recognition, Public image, Influence, Social power, Security, Peacefulness, Social order

Note. '**Obj**' implies 'Objective' values, '**Sub**' implies 'Subjective' values, and '**Rel**' implies 'Relational' values. Adapted and modified from Béné (2003) & Nayak et al. (2014).

faced ‘economic exclusion’ while high-class non-fishers like local moneylenders have received the benefits of SES change.

5.3 Impacts of Key Drivers on Values and Beliefs

The typology developed by Béné (2003) and Nayak et al. (2014) provides the basis for a rich analysis of existing and potential marginalization and poverty drivers in the island based on eight inter-related proximate key drivers of values and beliefs, including economic exclusion, social marginalization, class exploitation, political disempowerment, environmental change, ecological marginalization, loss of identity, and fishers’ disconnection from resource and his fellow fishers. In each following section, I have shown that each proximate driver of social-ecological regime shift has been impacted by a combination of distal drivers, and has made a diverse set of impacts on values and beliefs of Sagar Island.

5.3.1 Economic Exclusion

Economic exclusion is defined as a “process which leads to the leaving out from a particular economic activity of certain individuals due to their economic/financial inability to access the factor of production necessary to enter and/or operate this activity” (Nayak et al., 2014, p. 8). There are different access restrictions when it comes to fishing in the Indian Sundarbans depending upon the particular area. Even though Sagar Island does not fall under the category of restrictive protected areas as it is a part of transition area of Sundarban Biosphere Reserve (SBR) (Figure 5.2), most of the fishers and dried fish producers are faced with restrictions of their access to the market economy. There are three types of access restrictions operating in Sagar Island. The first is a result of the creation of marine and protected coastal areas within the Sundarbans region. Nayak et al. (2014) declare that restricting fisher’s access to fishing territories and resources is a way of limiting their access to the market economy. The decline in overall fish stocks and also the catch per unit effort has resulted in meagre earnings for the fishers and therefore compelling those to fish in prohibited areas sometimes even near the Indo-Bangladesh border.

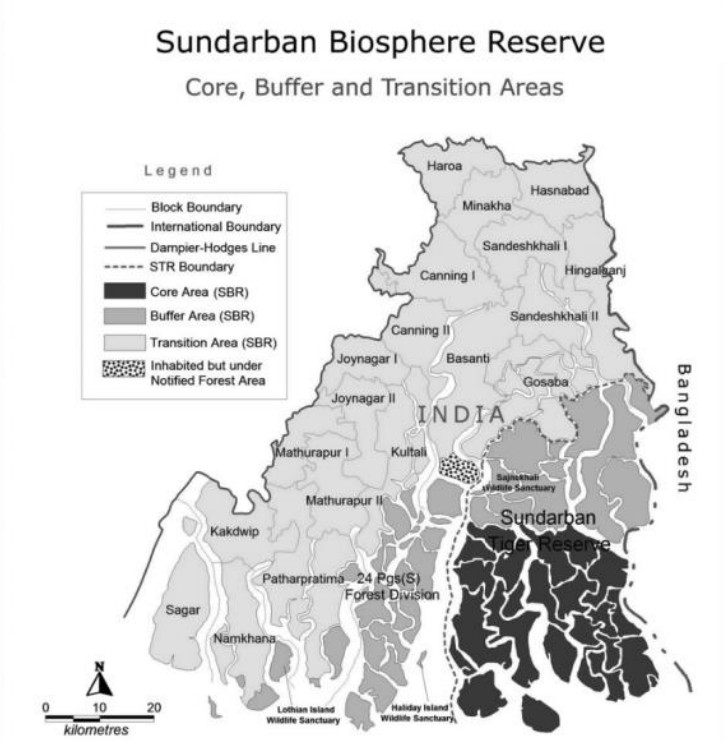


Figure 5.2 The Sundarbans Biosphere Reserve (SBR) is divided into core, buffer and transition areas for resource management. No human activities are allowed in the core area. It includes part of the Sundarbans Tiger Reserve (STR). Fishing and honey collection are allowed with permits in the buffer zone. The transition area is densely settled by 4.4 million people, mostly farmers and fishers. *Note.* Adapted from West Bengal Forest Department and World Wide Fund for Nature (WWF), India; Cartography by Kar & Ghosh.

The second restriction is a result of the creation of the debt system between local fishers and moneylenders (*Aratdaar*). These fishers who are in debt to the local moneylenders not only have to pay off their loans at high-interest rates but also are forced to sell their catch at a lower price to the moneylender. The third type of restriction is a consequence of competition with industrial fisheries. Most small-scale fishers and dried fish producers believe that the industrial fishing done with trawlers (Figure 5.3) is the leading cause for the depletion of fish stocks. Trawlers have emerged as the biggest menace in the list of anthropogenic disturbances in the Sundarbans during the last two decades. Besides polluting the aquatic environment by employing a 120-370 horsepower engine and consuming ~40 litres of oil in an hour, the industrial fisheries have been steadily intruding on traditional small-scale fishing areas in search for higher catches, therefore, inflicting possible damages to fish stocks and marine habitats. The trawlers also drag big-sized trawl net along the ocean-bottom destroying on-bottom habitat life.

Figure 5.3 Several fishing trawlers working in the sea can be seen on a clear day from the shore of Sagar Island (Photo: Sevil Berenji).

5.3.2 Social marginalization

Social marginalization is defined as a "social process which leads to the denial of the marginalization command over a resource, service or commodities for certain actors based on social criteria such as caste, gender, or ethnic origin" (Nayak et al., 2014, p. 8). In the Indian Sundarbans Delta (ISD), caste and religious identities are not a determining factor of access to resources and opportunities as also verified by a WWF-India (2011) report. Both river and sea fish are considered as 'commons' and 'collectable' by everyone. The proximity of different religions, castes and indigenous and immigrant households in the region point towards the existence of shared cultural and livelihood practices. Also, even though small-scale fishery sector appears to occupy the lowest rung of the social ladder due in part to the Indian caste system and lack of sophistication in the nature of fishing work, none of the informants belonged to the Indian categories of Scheduled Castes (SCs), Scheduled Tribes (STs) and Other Backward Castes (OBCs). As a result, despite being at the lowest rung of marginalization, they are not entitled to certain privileges by the government, such as the reservation (reservation or quota in India is a system of affirmative action that provides representation for historically and currently disadvantaged groups in Indian society in education, employment and politics) of employment or education opportunities.

While situating the Sagar Island fishery in the context of the Indian food industry, fisheries in India are generally perceived as a sector that is ever-expanding and therefore should act as an

ideal livelihood option for fishers. In contrast, the reality is that the fishing communities of the island live in harsh and demanding conditions. In the Sundarbans, the villages are in remote areas, with minimal access to education and health facilities. The accessibility of the island from the mainland, including the market spots, is only possible through waterways by mechanized or non-motorized boats. The remoteness and transportation constraints in most of the villages are two of the factors for the poor development of the region. The underdeveloped situation of the area acts as economic, social, and political drivers in SES by undermining the potentials of the region which can eventually cause social marginalization of the fishery households. Social marginalization and the sense of being left behind from the rest of the society can lead to the possibility of migration within the community in the hope of finding better opportunities which pushes them further towards social marginalization.

5.3.3 Class Exploitation

Class exploitation is defined as a "situation where a higher class is perceived as being in the position of extracting surplus labor from a (lower) working class, or where this 'lower' class is considered as not receiving its 'fair share' of the benefits created by an economic activity" (Nayak et al., 2014, p. 8). With fish and dried fish market being globalized, the existing combinations of class dynamics, along with other changes in Sagar Island, have aggravated the process of marginalization among community members. During the field visit, it has been found that 95 per cent of the informant households (n=45) are interacting with local moneylenders (*Aratdaar*) as they have taken short-term loans from them as a coping strategy. These households not only have to pay off their debts with a very high-interest rate (~60 per cent/year) but also stay obliged to sell their products only to the moneylender (*Aratdaar*) itself at 50 per cent reduced rates from the market price. The ratio between household income and the size of the loans shows that the economically-poor fisher and dried fish producer families will continue to stay trapped in the vicious cycle of indebtedness for years and maybe for coming generations as well. This process, which has been active for the past five decades on the island according to the informants, accelerates the economic exploitation of the fishers and dried fish producers already dealing with poverty and marginalization.

The trade (fish to money) between fishers/dried fish producers and the local moneylenders and middlemen is highly skewed to the disadvantage of the former. These middlemen work as an

intermediary between fishers and the market because most fishers of the Sundarbans do not have access to sufficient ice to preserve their catch or the means to transport them to fish markets themselves. In the past, there used to be only one to two layers of intermediaries (*fode*) involved between small-scale fishers/dried fish producers and fish market. But now there are at least four to five middlemen involved. Consequently, this process makes the fishers and dried fish producers highly vulnerable as their overall earning lessens, or stays unchanged, despite the increase in their cost of living. A fisherman describes the market situation of fishery products of the island as follows:

> *Nowadays, there are four to five middlemen involved between the fishes and the eventual buyer, which eats up most of our profits. Sometimes we get paid four times less than the final selling price of our products. Our dried fish productions get sold even in the farther regions like Assam and Siliguri.*

(Male, Fisher and dried fish business owner)

5.3.4 Political Disempowerment

Political disempowerment is defined as "situations where actors are 'left out' from participation and/or decision-making processes leading to low/poor opportunities to control and govern their own command over resources. This may result in reduction or even denying of access and use of the resources. The initial barriers are due to asymmetrical power relationships based on social stratification" (Nayak et al., 2014, p. 8). Béné and Friend (2011) argue that the issue of poverty in fish-dependent communities cannot be limited to a simple correlation between income poverty and fishery dependence. Instead, poverty in fishing communities often links to a wide range of social-institutional factors other than income, including land ownership, debt, access to health, education and financial capital (discussed in previous sections of this chapter), and marginalization from political decision-making.

The prevailing model of resource management in India is top-down, with centralized decision-making (Ghosh et al., 2018). In the Sundarbans, the creation and management of marine and coastal areas happen mostly without the participation of resource users, especially small-scale fishers. Surveys and interviews conducted during the study showed that owing to the efforts of Fishermen Association, all-male informants in SSF and DF production were at least aware about the existing rules and regulations of marine and coastal areas in their region. In contrast, for females, the same number fell to just 4%. In fact, the existing predominantly patriarchal and patrilineal system in society of Sundarbans has pushed women toward the lack of awareness and

social deprivation which eventually leads to an almost complete absence of women from the efforts of resource management at local levels. And when it comes to political disempowerment, it is common in both men and women. Male members link their political disempowerment to their low levels of education. But there are other factors also responsible, such as geographically distant location of Sagar Island from the capital city of the state, Kolkata, where most policy decisions take place.

Small-scale fishers of Sagar Island have learned and are open for further learning from anyone who is in a position to guide and advise them. Unfortunately, the reverse is not true, as no system allows systematic learning from them as a community and puts value to their opinion and experiences in the governance of the Sundarbans area (Chacraverti, 2014; Jalais, 2010). One of the factors could be the topography of southern part of Sagar Island which is literally 'on the move', with relatively frequent disappearance of land on the one side, and the deposition of silt and appearance of new islands on the other. This has forced hundreds of islanders to immigrate and seek refuge elsewhere. This particular phenomenon and increasing environmental degradation are often presented as excuses for the lack of efforts from those in power to improve the wellbeing of the islanders, with programs such as strengthening health care services and building roads or forming a political or administrative system that consults with locals about the rights and obligations of resource-management (Jalais, 2010).

As fishing is considered a male-dominant profession in the Sundarbans region primarily, the administration interacts mainly with the men. The informants revealed that several women on the island have been left to survive on their own after their men suffered accidental deaths while fishing. Management plans from the policymakers do not take into consideration such impacts on the lives of women in the community leading to their social marginalization. However, many fishermen of the islands do mention that at the family level they do consult their women during the decision-making process.

The Sundarbans is observing an increasing number of regulations and closed seasons within the permitted fishing area every year. The seizure of the boats and nets, imposition of fines or even arresting of fishers by officials are significant concerns for the Sundarbans fishery households. The actual threats for the fragile ecosystem of the region are derived from the pollution caused by developmental activities, including industrial activities and sewage discharged from the mainland. The existing conservation policies and the diverse regulations carried out by the West

Bengal state are by no means constructive - not for the people nor for the environment. Therefore, the region continues to be exploited by development plans and companies who never pay any fees to utilize the Sundarbans resources. Lack of political empowerment among the fishing community made them suffer silently and hoping for better luck in the catch for next time around.

5.3.5 Environmental Change

Environmental changes are defined as "both known and unexpected changes in the human-dependent environment and its associated resources due to direct and indirect influence of multi-level drivers" (Nayak et al., 2014, p. 8). The case studies provided in Nayak et al. (2014) show that the degradation of the natural system brings poverty to a community. The connection between poverty and the resource or natural environment is a strong one in Sagar Island. The existing economic or income poverty and its related dimensions such as food insecurity among the small-scale fishers and DF producers of the island are directly linked to the loss of fish productivity and access to natural resources. The impacts of environmental changes are likely to be uneven in marginalized societies, which further intensify the vulnerability levels in resource-dependent groups, particularly, the poorest (Nayak et al., 2014). These impacts have significant implications in the processes of discrimination and poverty in a society.

Climate change is a crucial problem not only in the Sundarbans area but also globally. Climate change is quite detrimental to human settlements and livelihood and hence comes as one of the critical drivers of migration, food insecurity and poverty in the Indian Sundarbans. Climate change-related weather events and sea-level rise in the Indian Sundarbans has induced a lot of migration (Roy & Guha, 2017). To assess the effects of climate change, it is necessary to list and measure different indicators of climate change in this area. The residents of the Sundarbans area are threatened consistently and increasingly by climate change and local environmental shifts. The existing ecosystem has witnessed a lot of disturbances like sea-level rise, changes in sea surface temperature, frequent and intense cyclones, and lastly rising air temperature and fluctuating rainfall patterns (Mitra et al., 2009; Mousavi et al., 2011; Pethick & Orford, 2013). A super cyclone Aila hit the Indian Sundarbans in May 2009 and had a disastrous impact on the land, destroying the assets possessed by the poor including boats, lands and facilities used for fish processing.

Key policy actors of the Sundarbans at both the state and district level lack clarity and awareness about the local impacts of global climate change in coastal areas, and the coping systems

used by the islanders (Abdullah, 2014). The uncertainty in the resource management results in the manifestation of long-term impacts of climate change, neglecting other key drivers such as socio-economic changes caused by unsustainable and unscientific policies, including land leasing and land transformation based on business requirements (Abdullah, 2014). These drivers of change might have direct and indirect impacts on the marginalization of small-scale fishing communities and their lack of recourse to social justice.

The maritime focus of Sagar Island livelihoods renders them particularly susceptible to the impacts of climate change. In the longer run, increased frequency, intensity and unpredictability of weather phenomena like thunderstorms and cyclones in the region would impact fishing patterns and may cause irreparable damages to housing and property in the area.

5.3.5.1 Sea-level Rise and Coastal Erosion

The Sundarbans is under a continuous threat of severe erosion and complete submergence due to sea-level rise and increasing cyclonic activities. In Sagar Island between 2002 and 2009, the relative means sea-level rise at 12 mm/year is much higher to the 3.14 mm/year in the previous decade (Hazra et al., 2010). Even the global average stands at 3.27 mm/year between 1993 and 2010. The rise in sea-level of Sagar Island is mainly due to subsidence of delta land (Chand et al., 2012) which presents a severe threat to the island during pre and post-monsoon phase when most of the cyclones take place.

Sagar Island is one of the most erosion-prone zones of the Sundarban region. The western bank of the island is known for experiencing high erosion, but now the southern bank and south-eastern banks are also eroding rapidly (Chand et al., 2012) as shown in Figure 5.4. The island is shrinking slowly, and it seems that the whole island will be underwater soon, just like Lohachara island (a neighboring island). Frequent erosions and flooding have devastated households by causing loss of human lives, decrease in landholdings, damage to properties, and lands becoming unproductive for aquaculture and agriculture due to the rise in soil salinity. The informants who have lived their entire lives on Sagar Island have stated that the island is being washed away, bit by bit, in front of their eyes. As a result, fish drying-related activities that are mainly carried out along the shore have been affected enormously because of the loss of space due to coastal erosion.

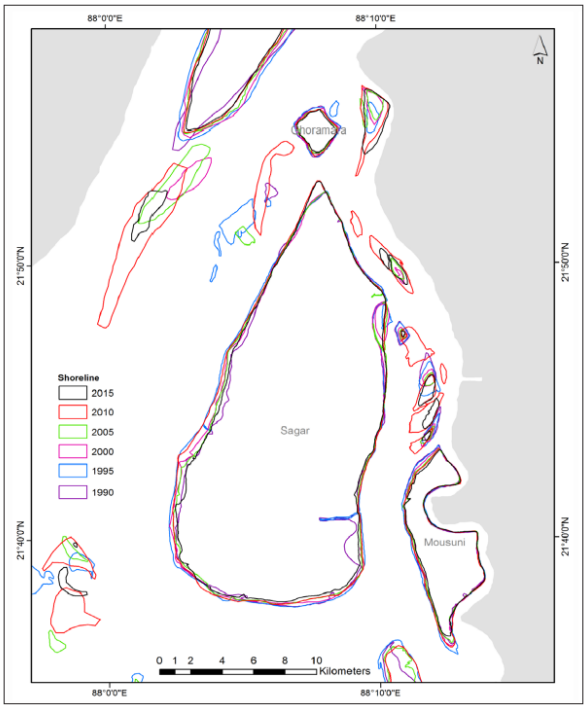


Figure 5.4 Morphological change analysis to identify the extent of erosion in Sagar Island and its peripheral island between 1990 and 2015. *Note.* Adapted from Hajra & Ghosh (2016).

Some parts of the Sagar islands are low lying, which means that any rise in sea level has a direct impact on the residents and their livelihoods. The inhabited island is protected by man-made concrete embankments against the ingression of saline water into the villages, and this makes livelihood activities such as fish processing and aquaculture possible in the communities.

5.3.5.2 Siltation and Subsequent Island Formation

The Sundarbans area goes through constant sedimentation in coastal parts, riverbeds, and canal beds. Local fishers suspect deposition of the coastal zone and subsequent island formation through accumulated silt as one of the critical factors for recent lack of fish gathering. According to local fishers, no mature-sized fish gathering is found nowadays surrounding the sand heads near the island leading to fishers travelling for long hours to find a good catch in remote areas. Additionally, these silt-formed islands are also causing boats to flip or get stuck, which increases the life risks among fishers further. The siltation of riverbeds by waterborne particles decreases the water-carrying capacities of rivers and canals, causing the river and canal floor to rise above all or most high tide levels. As a result, boats that are parked in the rivers and canals can get stuck in the silt (Figure 5.5) and become hard to use for the fishers.

Figure 5.5 Small-scale fishing boats are stuck in the canals as the result of sedimentation in the river and canal beds (Photo: Sevil Berenji).

5.3.5.3 Changes in Weather and Cyclone Activity

The small-scale fishery in the Sundarban region is heavily dependent on annual monsoon and therefore is exposed to the risks caused by weather variations. Hence the damage to human lives as well as livestock every year suggests that the dangers of climate change and extreme weather events are real. The data indicates that the poor are affected by cyclones more than others in terms of dwelling related destruction as they are often forced to live in more vulnerable areas and that they tend to have nondurable houses (O'Donnell, 2015). Many of the deadliest tropical cyclones of India during the last few decades have occurred in the Bay of Bengal, including Super Cyclone Sidr in 2007 and Cyclone Aila in 2009 (Webster & Webster, 2011) causing severe damages to the residents of the Sundarbans area. Fishers have reported experiencing more unpredictable changes in weather than they had previously been accustomed to. Such unpredictable weather could cause massive loss of life and livelihood, leading to large-scale migration among indigenous communities. For example, DF production can be easily affected because of unseasonal rains destroying huge quantities of fish lying open for drying.

5.3.5.4 Pollution in Coastal and Estuarine Water

Frequent oil leakages and regular washing of increasing numbers of petrol-operated fishing trawlers and vessels are causing water pollution near local sand heads. Local fishers also acknowledge it as one another vital factor for the recent decline in the number of catches. Other

than this, the rapid discharge of industrialization and urbanization wastes coming through the Hooghly river at the west side of Sagar Island is polluting Hooghly-Matla estuarine and coastal water in the Sundarbans (Sinha, 1998). Also, Sagar Island that is surrounded by Hoogly and Muriganga river is a famous Hindu pilgrim place (Gangasagar). Every year on the day of Makar Sankranti in mid-January, thousands of Hindus gather to celebrate 'Gangasagar Mela' by taking a holy dip at the confluence of the Ganges river and the sea and offer puja (ceremonial worship) in the ashram of Kapil Muni (Figure 5.6). Some members of the Fishermen Association referred to this event and the tourist and devotees it attracted as one of the significant factors for the pollution of both land and water, as is described in the following account:

> *The Gangasagar Mela benefits the region temporarily by creating a lot of temporary jobs and livelihood opportunities but also causes huge amount of degradation to environment each year. The amount of garbage being left after the rituals and celebration are over is very disturbing.*

(Male, Secretary of Fishermen Association and former fisherman)

Figure 5.6 The famous ashram of Kapil Muni in Sagar Island (Photo: Sevil Berenji).

5.3.6 Ecological Marginalization

Ecological marginalization is defined as a "process which leads to the denial of the command over a resource, service or commodities for certain actors based on ecological criteria such as type of ecosystem, status of degradation, level of impact from drivers" (Nayak et al., 2014, p. 8). Nayak et al. (2014) expanded Béné's conceptualization of marginalization, which was based on social criteria, to include ecological criteria by declaring that social factors cannot merely cause marginalization. The average marginalization and poverty of a society should not be seen merely

as a state of being, but rather as a process of instability and disempowerment over time (Nayak et al., 2014). This process in Sagar Island results in its small-scale fishers losing control over fishery resources because of being under the influence of interrelated and multidimensional drivers.

The challenges posed by conventional fishery conservation approaches are several. Firstly, there is no scientific study of fish stock management within the Sundarbans region as the fishery-related officials such as Fisheries Department of West Bengal, and Central Marine Fisheries Research Institute (CMFRI) are not involved in, or rather not allowed by the Forest Department to get involved in, doing a stock assessment because of some internal political reasons (Sen & Pattanaik, 2017).

The second challenge is that the fish banning season has not been updated by officials based on current conservation requirements. The timetable shown in Table 5.2 demonstrates the fishing, dried fish production, Hilsa fishing, and fishing ban period in Sagar Island. According to the fishers and dried fish producers, fishing and dried fish production take place from September to mid-February. Mid-October to mid-December is generally considered a peak period for fish catching and drying. In contrast, mid-December to mid-February is considered a lean period for the activity. The peak and lean periods for undertaking the dried fish operation largely depend on the fishing season itself. The quality of the dried fish can also only be achieved by ensuring maximum exposure of sunlight and minimum moisture content in the air. Therefore, if any unexpected change in weather condition (e.g., heavy rain) happens during the fish processing, a large percentage of the profit is lost, which could further push the fishery households under extreme poverty.

In the interviews conducted, fishers stated that Hilsa (*Ilish*) fish, which is the single most important species of the Sundarbans, is mostly caught during Monsoon season as there should be sufficient rain and eastern wind for attracting them from Bangladesh towards the Sagar Island. As demonstrated through the table, the fishing period of Hilsa, which is generally from the start of June to the end of August in Sagar Island, conflicts partially with government's fishing ban period. While interacting with the fishers of Sagar Island, it came to light that the year data of this research was collected (2019) conventional lean period for Hilsa has been the only period it was available for fishing. Fishers identified insufficient rain and the random direction of the wind as the main factors behind the decreasing number of Hilsa fish in 2019 Monsoon season. All the challenges mentioned above make the livelihood of the fishers extremely difficult, often leading them to

violate the norms and regulations more than they would otherwise have done.

Table 5.2 A helpful table and process depiction of fishing, dried fish production, Hilsa fishing and fishing-ban period in Sagar Island by referring to the common lunar calendar

Traditional Season in Bengal	*Grishshô* (Summer)		*Bôrsha* (Wet season/Monsoon)		*Shôrôd* (Autumn)		*Hemanta* (Dry season)		*Sheet* (Winter)		*Bôsôntô* (Spring)	
Month name (Sanskrit, Hindu Vikrami lunar)	*Vaisākha*	*Jyeshta*	*Āshāda*	*Shraavana*	*Bhādra*	*Ashwina*	*Kartika*	*Agrahayana*	*Pausha*	Māgha	Phālguna	*Chaitra*
Month name (Gregorian calendar)	Apr – May	May – Jun	Jun – Jul	Jul – Aug	Aug – Sep	Sep – Oct	Oct – Nov	Nov – Dec	Dec – Jan	Jan – Feb	Feb – Mar	Mar – Apr
Fishing & Dry Fish Production Season					A1	A1, A2	A2	A2, A3	A2, A3, A4	A2, A4		
Hilsa Fishing Season				B1	B1	B1, B2						
Fishing Ban Period	C1	C1	C1	C1, C2	C2							

For the year data of this research was collected (2019), the lowest catch period of Hilsa season became the only period that fishers of Sagar Island caught Hilsa

Introducing new fish ban period has forced fishers to not get involved in fishing for continuing 5 months in rivers and canals

Note. **A1:** Preparation for the fishing & dried fish production season; **A2:** Fishing & dried fish production season; **A3:** Highest catch period; **A4:** Lowest catch period
B1: Hilsa season; **B2:** Highest Hilsa catch period; **B3:** Lowest Hilsa catch period
C1: Fishing ban period; **C2:** New (2019) two-month fishing ban period in rivers and canals
Data are from semi-structured interviews and focused group discussions with small-scale fishers and dried fish producers of Sagar Island.

5.3.7 Loss of Identity

Poverty can be closely linked to individual and community identity in fisher societies (Hapke & Ayyankeril, 2004; Neis et al., 2005; Power, 2005). The small-scale fishery has been perceived as a reliable source of livelihood among coastal communities as it has been consistently passed from one generation to the next for centuries. Although during the field discussions, it has been found that unlike their parents, most of the current small-scale fishers are not interested in passing it on to their next generation as the satisfaction derived by the fishers from their livelihood (fishing) is gradually being replaced by a deep sense of desperation and misfortune.

For many fishers and dried fish producers of Sagar Island, the fishery and fishing activities, in general, are central components of their lives. Not only does fishing constitute a significant component of the local economy but also has been among the main drivers allowing people, especially women, in the community to reduce their sense of isolation and poverty in general. It signifies that the identity of fishery workers understood through fishing as a 'way of life' (Gatewood & McCay, 1990; McGoodwin 2001; Onyango, 2011), and workers' perceptions are influenced by the social and cultural worlds which they inhabit (Narayan et al., 2000).

In Sagar Island, occupational identity supersedes any ascribed identities like caste and religion, and makes them irrelevant. In other words, people associate their identities to traditional livelihood practices while further relying on the recognition of customary rights as a tool of legitimization. In fact, the ongoing adversity has made community subordinate potential religious or caste discriminations that exist in other parts of India. This mechanism has helped them build high social cohesion and unity among each other. Therefore, some factors such as climate change impacts not only fishing productivity but also the occupational structure and self-identity of the fishers and dried fish producers.

The evidence gathered from the field visits suggests that in Sagar Island, cyclones and the destruction they cause is leading community members towards more of temporary migration. As a result, some members of the households, mainly men, are forced to leave fishing to find more reliable livelihood options in other places. With most of them ending as daily wage laborers in fishing or construction sector, the traditional notion of local 'fishing community' and 'fisher family' gets weakened. This migration is mostly towards Kerala, Hyderabad, Tamil Nadu, Mumbai, and Delhi regions. Although this diversification of income sources helps fishery households in combating the deteriorating financial condition, it also presents specific identity and

security concerns for the migrants and their families back home. One of the fishers stated his side of the story like this:

> *We are the folks of fishing. We do not know anything else other than it. Nobody has come forward to give us training for alternative livelihoods. I go to Kerala every year during the fishing ban period as there are more job opportunities with better payments.*

(Male, Part-time fisher in Sagar Island and daily wage laborer in Kerala)

The diverse but interlinked regime shifts in Sagar Island have led fishers and dried fish producers to feel marginalized and alienated from their place of work. Many changes that have happened until now seem to be altering the link between fishing and place, and are outside of people's control. For instance, fishing trawlers have generated a massive amount of hatred among the local fishers and dried fish producers for many reasons already mentioned.

Further, like in other case studies (see Nayak et al., 2014), the presence of fish signifies 'power' for the fishers of Sagar Island in a way that if there is no fish, there remains no power and also no plate to serve the family. Fish here symbolizes the political, ecological, and cultural identities of small-scale fishers/DF producers of Sagar Island. These identities are interlinked, rather than being separate entities, and are woven in every part of the entire 'fish chain'.

5.3.8 Human-environment Disconnection

The destruction may cause a human-environment disconnection in the physical, economic, political, and psychological bond between people and their environment (Nayak et al., 2014). In Sagar Island, a complete human-environment disconnection had not yet taken place but is likely to occur if the trend continues. In case it happens, it will only give rise to more vulnerability in resource-dependent communities. As a result, the gradual loss of fishing-based livelihoods, a high number of subsequent out-migration, and loss of environmental knowledge and a sense of stewardship among the small-scale fishers/dried fish producers will be perceived and will adversely affect the human wellbeing (Nayak & Berkes, 2012). Loss of fishing-based livelihoods among the small-scale fishers of the island has been observed as a driver of physical and emotional disconnection of the fishers from their fishing environment. Although, some fishers have shifted their occupation from self-employed to laborers in the fishing business, the sense of detachment from the environment has started to grow with the realization that fishing is no longer something they can rely upon, and in the long run such belief threatens the whole survival of the fishery in the island. Direct access to environmental resources encourages a strong bond through the

physical, psychological, economic, and political relationships between people and their environment and among each other, which eventually leads to strong environmental knowledge and a sense of stewardship.

5.3.8.1 Reading the Water

The fishers can read the water they fish in. They can see the currents, eddies, and possible areas of risks and dangers. They can detect the fish shoals by the change in the pattern of waves atop them and in the color of the water.

The Sundarban delta has been going under progradation (growth of a river delta farther out into the sea over time) by the continuous barrage of silt. Underwater silt deposits and spreads outwards from the coast, thereby turning the coast of Bengal full of underwater silt-banks. They are generally less problematic for the light *Dingi* boats (the most familiar small boats in Bengal area). However, they can be dangerous for the slightly larger and heavier boats, especially when fully loaded. Fishers can detect a hidden silt-bank by observing the patterns of waves around it. However, the same technique could not be used when it is dark or when the weather is stormy. Although fishers get the general idea even before the release of the official forecast from the meteorological department, by predicting the pattern of the storm from the highs of waves, most of the time the notice period proves too small for them to be able to return to the shore safely.

5.3.8.2 Awareness and Knowledge of Resources, and the Management Thereof

In terms of knowledge, level of awareness, and values and beliefs, there is some difference between those who are in direct contact with the water by fishing in it or merely working on the boats and those who are in indirect contact with the water by working in pre- and post- fishing jobs. Among those who are in indirect contact with the water like dried fish producers, differences in knowledge, level of awareness, and values and beliefs are also defined and depend on several factors - for example, the relationship of them with those who fish in the water or their engagement in fishing-related official jobs. During the interviews, most male fishers were keenly aware of the resource crisis confronting them. They see the catch per unit effort, and the overall catch is declining. They also realize that certain species have become unavailable or very rare. They mentioned Hilsa (*Ilish*; scientific name: *Tenualosa ilisha*) fish as having become exceedingly rare. During the interviews, fishers and dried fish producers were asked regarding what they felt were the reasons for the

declining catch, and species are becoming unavailable or rare. The reasons mentioned by fishers and dried fish producers are represented in Box 5.2 (the sequence does not reflect priority).

Most dried fish producers (mostly women) were not fully aware of any change in the number of catch or weather conditions in the water. Some female respondents did hear about the massive decline in the number of fish from their husbands, but still, they were unable to assign a reason for it. A few women also shared the contrary view of observing an increase in the number of catch in recent years. During the interviews, it was noticed that most of the male fishers were not satisfied from their current communication experience with their wives and were complaining about their wives' disinterest in listening to what they have been dealing with every day. Moreover, the women, who had jobs other than dried fish production like teaching in public school or leading a local self-help group or representing women in the Fishermen Association, had remarkable knowledge and awareness regarding the current situation of the fishing business in the region. As a result, it has been concluded that the major reasons behind the unawareness of women regarding the changes happening around them could be their illiteracy, limited experience with the fishing environment, and limited communication with the members of their household as well as a fishing community. These gender differences originated from the predominantly patriarchal and patrilineal system in society of Sundarbans where the activities are mainly controlled by men, while women are second-class citizens.

In Sagar Island, it is mostly the male members of a household who go for fishing either on their own boats or as contracted fishers on someone else's. In contrast, female members engage with post-harvest activities such as dried fish production. A few fishers acknowledged that in the small creeks of the villages located in the eastern side of the Indian Sundarbans, the fishing is done mainly by women on *Dingi* boats (the most familiar small boats in Bengal area). They added that they were also willing that their women would become brave and venture out in fishing business like those women.

Box 5.2 Different reasons behind the decline in the catch and species according to small-scale fishers and dried fish producers of Sagar Island

1) Trawlers and mechanized boats repeatedly forage the coastal waters and rivers while looking for big-sized fish. After large-scale hauling, they separate big- and small-sized catches from each other and throw back small ones that are dead or dying. This leads not merely to a noticeable reduction of catch, but consequent harm for fish populations.

2) Trawlers and other mechanized boats have instruments that could detect fish shoals underwater, leading them to make massive hauls that leave the waters devoid of fish. Therefore, these trawlers and large mechanized boats cause a greater impact on fish population than a mere increase in the numbers of small-scale fishing.

3) Fishing trawlers harm the sensitive seafloor habitats by dragging heavy and large gear across the seabed.

4) Reckless religious tourism has devastating effects on Sagar Island. As the number of tourists increases, more pollutants such as discarded plastic is left in the water and onshore. It decreases the amount of fish and impacts spawning grounds.

5) Religious beliefs like the killing of a mermaid in the Odisha state of India by a fisherman led to a decline in the catch. There is a belief that killing a mermaid could cause anger in deities.

6) Certain nets occasionally used by small-scale fisher, especially in the riverside, also end up harming the fish population by damaging the regeneration process of fish as well as interrupting the growth of fully matured fish. For example, mosquito nets (nets of minuscule mesh size), mostly used in collecting shrimps, cause the scooping up of fish eggs, larvae, and fingerlings which later on gets thrown back dead.

7) Most of the fish species are spawned in the coastal waters. So, an increase in the number of fishers and overfishing in the coastal waters also leads to a decline in fish population in the rivers.

8) Urban and industrial wastes and agricultural pesticides get into the rivers and the sea in the form of waste disposal and cause a decline in the fish population.

9) Excessive sedimentation in the coastal area and subsequent island formation (silt islands) push away mature-sized fish gathering around the sand heads near the island.

10) Unpredictable flows of wind and shifts in weather patterns, such as insufficient rain and an absence of Eastern winds in Monson season necessary for catching Hilsa (*Ilish*) fish, affect the population of fish enormously.

11) Continuously decreasing mangrove population and cyclones cause land erosion in the river and seasides. As a result, the areas dedicated to dried fish production get washed away.

5.4 Chapter Summary and Conclusion

In this chapter, the information gained from the discussions and secondary sources has been used to define distal and proximate key drivers of values and beliefs (Sec 5.2), and the impacts of these key drivers on values and beliefs (Sec 5.3). The typology introduced by Béné (2003) and Nayak et al. (2014) has been used to understand how a combination of distal drivers has impacted each proximate driver of a social-ecological regime shift, and how the regime shift contributes to a diverse set of values and beliefs in Sagar Island.

In Sagar Island, poverty and impoverishment are the outcome of changes in the ecological subsystem (e.g., habitat destruction, sudden weather changes, and water quality) and gradually affects the social subsystem through the loss of fish productivity, fisher livelihoods, local institutions, and livelihood diversification. Economic and political restrictions such as pressure from industrial fishing, denial of access to the fair market through the establishment of local moneylending and intermediary channels, and reduced access to the fishing area through the extension of fishing ban periods, has paved the way for further marginalization of the local fishing community and for changes in values and beliefs.

Substantial changes in livelihoods, institutions, and culture, along with social, economic, and political practices that are under the influence of multiple drivers could extend and deepen the risks and consequences of poverty in an area (Nayak et al., 2014). When the existing rules, norms, value systems, and terms of interaction between people and with the ecosystem become dysfunctional, values and beliefs start to deteriorate as the SE system starts collapsing. In the case of Sagar Island, some livelihood adaptation such as travelling to remote areas like Kerala for working as daily wage laborers has limited the increase in poverty among the fishery households.

CHAPTER 6

The Connections Between Values and Beliefs and Social Wellbeing in Small-Scale Fishery and Dried Fish Production

6.1 Introduction

The notions of social wellbeing are built socially and culturally while being rooted in a particular time and place (Atkinson et al., 2012). Therefore, it is critical not to assume a single or universal approach for social wellbeing, but to investigate how wellbeing is understood by the people who are the subjects of research (White & Blackmore, 2016). The use of natural resources shapes people's values and beliefs as they seek to achieve their notion of 'what it means to live well in a certain social-ecological context' (see Coulthard et al., 2011). Moreover, the ability to live well depends upon the degree to which one has the capability (material, relational, and subjective capabilities) to achieve something which is valued and believed (Johnson et al., 2018). Therefore, it is important to find out what the fishing and dried fish communities mean by their well-being. In this chapter, the connections between 'values and beliefs' and 'social wellbeing' of small-scale fishers and dried fish producers of Sagar Island is examined. This foundational understanding of social wellbeing sets the context to analyze objective three of this thesis (Box 6.1).

Box 6.1 Review of research objectives

> 1) Identify the diverse values and beliefs and their meanings that are hidden in the small-scale fishery (SSF) and dried fish (DF) production community groups;
>
> 2) Define the key drivers of values and beliefs and how they have affected the values and beliefs of community groups; and
>
> **3) Examine how the values and beliefs of community groups are connected to their social wellbeing (i.e., material, subjective, and relational wellbeing)**

The following section unpacks different dimensions and facets of the social wellbeing framework to analyze some of the values and beliefs that are considered to have improved or deteriorated the quality of life of the fishing community. In other words, these dimensions define what people consider as contributors to quality of life and the ways in which they strive to achieve them. Social wellbeing has three dimensions: (1) material wellbeing (i.e., economic situation, the tangible material of life, physical environment) (Sec 6.2); (2) relational wellbeing (i.e., social and political

situation, social interactions and the norms that govern society) (Sec 6.3); and (3) subjective wellbeing (i.e., psychological situation, cultural values, ideologies, beliefs and people's perceptions of their situation) (Sec 6.4) (White, 2009b).

The aggregation of different facets of a "life well lived" is particularly useful for understanding the three dimensions (material, relational, subjective) of social wellbeing (Armitage et al., 2012). The types of research methods employed to tease out the impacts of specific and individual facets of social wellbeing include participant observations, semi-structured interviews and focus group discussions. While questioning the informants about their wellbeing during the semi-structured interview process, I framed the questions in such a way that it allowed fishery households of the island to understand the hidden meaning of wellbeing. Questions were categorized into three main groups: 'what they have' (i.e., material wellbeing), 'what they are able to gain or achieve through relationships with others'(i.e., relational wellbeing), and 'how they feel about their possessions and achievements (i.e., subjective wellbeing).

As explained in Chapter 4, value theory in social science explains that values are constructed through human action while they also motivate human action (Johnson et al., 2018). Hence, we try to live consistently with our values while adjusting them according to our lived experiences (Graeber, 2001). A list of diverse social values derived from a value inventory

Table 6.1 Dimensions and facets of social wellbeing and their relevant values

Wellbeing Dimensions (White, 2009b)	**Facets** (Coulthard et al., 2011; Weeratunge et al., 2014; White, 2009b)	**Relevant Values** (Song & Chuenpagdee, 2015 ; Song et al., 2013)
Material (Sec 6.2)	Livelihood diversity (Sec 6.2.1) Assets (Sec 6.2.2)	Economic wealth, Livelihood, (scientific) Knowledge
Relational (Sec 6.3)	Local community (Sec 6.3.1) Close circle other than family (Sec 6.3.2) Family and Household (Sec 6.3.3)	Conformity, Obedience, Affection, Benevolence, Social cohesion, Sense of belonging, (local ecological) Knowledge, Social recognition, Public image, Influence, Social power, Security, Peacefulness, Social order
Subjective (Sec 6.4)	Self-identity (Sec 6.4.1) Collective Identity (Sec 6.4.2) Satisfaction (Sec 6.4.3) Autonomy (Sec 6.4.4)	Identity, Moderation, Achievement, Freedom, Spiritual/religious value, Hedonism, Self-actualization, Tradition, Cultural sustainability, Attachment to place, Pleasure, Hedonism, Novelty

compiled in Song et al. (2013) corresponds with each dimension of wellbeing. The different dimensions and facets of a social wellbeing approach and the relevant values in the small-scale fishery are illustrated in Table 6.1, above. The categorization of each dimension should not be seen as a strict association, as each dimension will also have connections to the other dimensions of wellbeing.

6.2 Material Wellbeing

The material dimension of wellbeing encompasses material assets, welfare and standards of living that a person and their household require to meet their needs and to live well (White, 2010). In the context of Sagar Island and its small-scale fishery, material wellbeing was disaggregated into two components for analysis based on the results of coded semi-structured interview data, and the references I relied upon include Weeratunge et al., 2014 and White, 2009b:

1) Livelihood diversity
    a) Primary and alternative livelihoods options
    b) Education
    c) Physical health
2) Assets
    a) Fishing boat and net
    b) Other assets (e.g., shelter, van, motorbike)

After reviewing the responses to the question on 'top three requirements of a successful life', money, education, and reliable job emerged as the three most important picks chosen by the informants (n=45) (Figure 6.1). Material wellbeing stood at the top among requirements of a successful life according to the informants - as many fishers declared, "If the economic condition does not improve, no social and mental wellness can be possible". This suggests that most of the fishery households on the island are trapped in poverty. These findings align with the theory stated by Graham (2011): "for very poor people, the relationship between income and social wellbeing is much stronger than it is for wealthier people" (p. 17). Throughout discussions, most respondents stated that despite an increase in the selling price of their catch, their overall earnings have decreased or remained stagnant in comparison to previous years. Therefore, their material wellbeing has not improved. Some of the important factors they attribute for this are: more people are now engaged in fishing, the higher investment cost of fishing, rise in the cost of living,

seasonality of the profession, irrational interest rates charged by local moneylenders, inherent poverty, and low availability of a reliable alternate source of employment. When it comes to material wellbeing among male and female members of the community, the majority of female informants mentioned that they give the income gained from dried fish production to their husbands. Indeed, much of the systematic gender differences in material well-being are due to the composition of social, economic, and political hierarchies in the society. Rafferty (2013) states that "social norms, cultural traditions, patriarchal attitudes and ideology, gender stereotypes and discrimination … are at the root of gender based social inequalities that benefit men and boys [over women and girls]" (p. 7). It is important to mention that the growth and erosion of values and beliefs in objective dimension of SSF and DF production represented in section 4.3.1 are directly linked with the growth and erosion of material wellbeing among the fishing community members of the island.

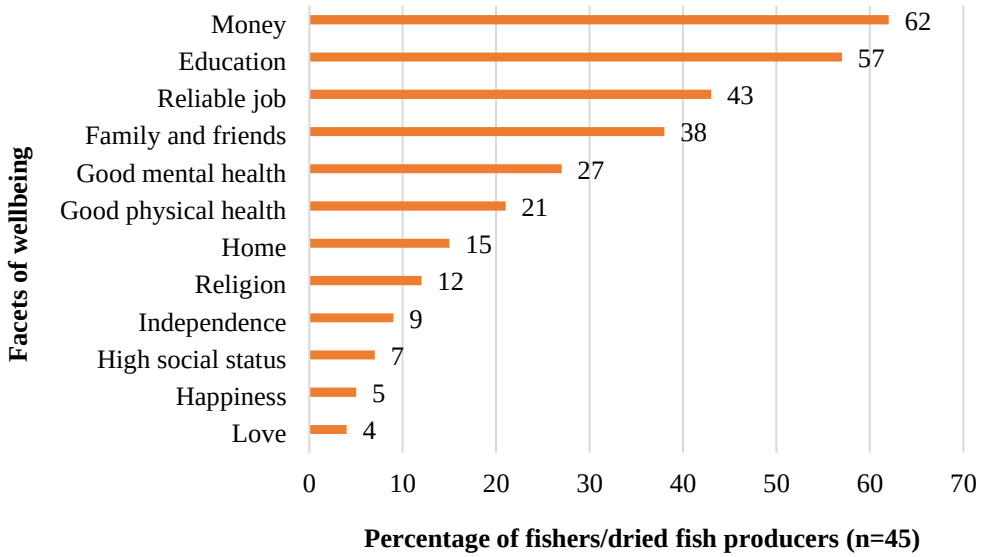


Figure 6.1 Top three requirements for a successful life as chosen by fishers/dried fish producers in Sagar Island

6.2.1 Livelihood Diversity

Wellbeing is very much based on the structure and improvements of livelihood approaches (for examples of livelihood approaches refer to Allison & Ellis, 2001; Carney, 2003; de Haan & Zoomers, 2005; Hoon & Hyden, 2003; Scoones, 2009). Livelihood is an all-encompassing term that describes "people's economic activity as a complex mix of priorities, strategies, influences, activities and alliances [drawing] over a range of material and social resources" (White, 2009b, p.

3). Likewise, Ellis (2000, p. 10) defines livelihood as "the assets (natural, physical, human, financial and social capital), the activities, and the access to these (mediated by institutions and social relations) and a combination of these three determines the living attained by an individual or household". For this research, the considered parameters of livelihood will be the activities (e.g., primary, alternatives) and resources (e.g., education, physical health) people use to pursue material wellbeing. In Sagar Island, community members expressed the following livelihood factors as of particular importance:

a) Primary and alternative livelihoods activities;
b) Education; and
c) Physical health.

These livelihood factors are discussed in the following sections.

6.2.1.1 Primary and Alternative Livelihoods Activities

Fishing and dried fish production is the primary livelihood activities of the informants in Sagar Island. Seventy-six per cent of the interview respondents (n=45) stated that fishing makes up more than 50% of their monthly income. Multiple fishers reflected on the importance of fishery in their lives through statements such as "We do not have any other skills other than fishing" or "We do not have land for agriculture". Therefore, for many fishers, livelihood is deeply bound to the existence and survival of coastal-marine ecosystem services (e.g., fish, shrimp and other sea life). While fish may be the main source of income for most fishers, weather conditions and catch amount (Chap. 5) can also be quite unpredictable. A Secretary of Fishermen Association of Sagar Island narrated his experience:

> *I still do fishing to make money, but I depend less on it as I have another source of income [from being a secretary]. My wife is also associated with dry fishing business, mainly because of economic needs. Most fishers of this island go searching for another source of income besides fishing. It is very difficult if you solely depend on the sea.*

(Male, Local Secretary of Fishermen Association and active fisher and dried fish producer)

During the off-season when fish availability is low, the majority of fishers on the island go searching for whatever temporary jobs they can find. During the interviews, 82% of the respondents (n=45) stated that they are engaged with multiple alternative livelihood activities to cope with the livelihood crisis (Figure 6.2). Some of these alternative activities include construction (e.g., masonry construction work, soil digging; for individuals/private sectors or

government projects through MGNREGA - Mahatma Gandhi National Rural Employment Guarantee Act), farming, official employment (e.g., working for Fishermen Association, teaching at school), and service work (e.g., shopkeeping, rickshaw driving, restaurant work, betel-leaf harvesting). Many people in Sagar Island are also shifting temporarily to their place of work, in case it is far off from the island. They migrate mainly to states such as Kerala, Tamil Nadu, Mumbai, and Delhi. In Chapter 5, the positive outcome (i.e., coping mechanism for worsening financial condition) and negative outcome (i.e., identity and security concerns) of such outmigration has been explained for the migrant and their family members who stay back.

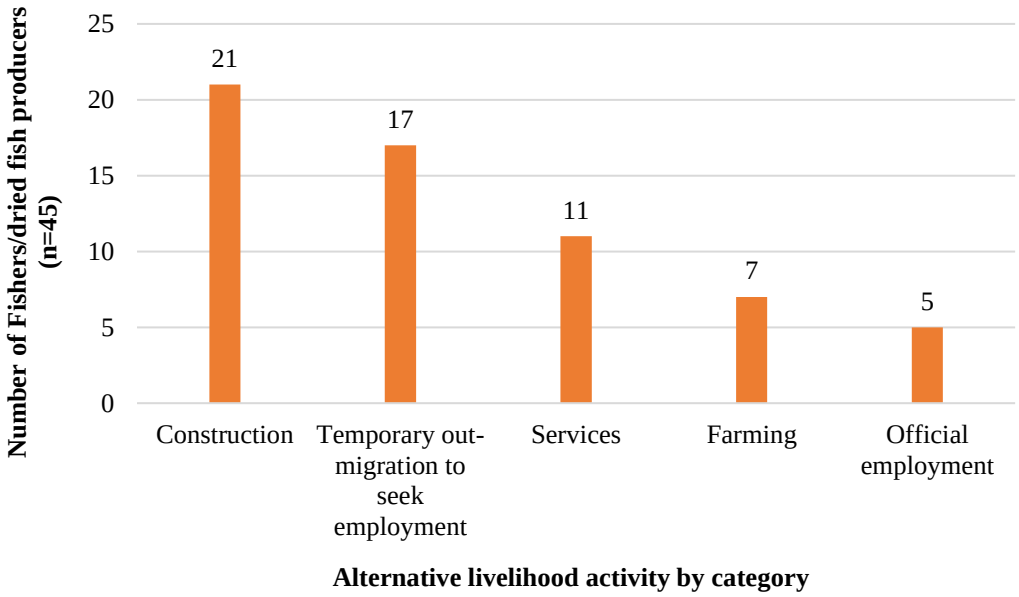


Figure 6.2 Alternative livelihood activities for fishers/dried fish producers in Sagar Island

Previous studies (Daw et al., 2012; Johnson et al., 2013; Katikiro, 2016) have identified the benefits of fishers' livelihood diversification on marine conservation: provision of successful "fishery exits" (i.e., abandoning fishing as a primary livelihood activity). However, there are challenges preventing access to alternative livelihoods in small-scale fishing communities, such as the absence of transitional funding and support programs, as is the case in Sagar Island. This results in worsening the current situation of the island and the inequitable distribution of benefits among households (e.g., middlemen could take advantage of households as resources such as market are not easily accessible to fishers). Researchers argue that in order to turn livelihood diversification into a success, a systematic and bottom-up approach must be followed, both in policy and in practice (IMM, 2008; Salagrama & Koriya, 2008).

6.2.1.2 Education

When questioned about the top three requirements of a successful life, 'Education' was chosen by 57% of the respondent fishers (n=45) as the second most important requirement (Figure 6.1). However, many current fishers and their families remain locked in a cycle of poverty which forces them to abandon formal education, mostly through high levels of dropouts from school:

> *Because I did not have the privilege to go to school [due to financial constraints], I cannot think about changing my place or profession anymore. I do not like the compulsion my generation has to bear because of lack of education. So, I work as hard as possible in order to ensure my children don't suffer the same fate. I strongly believe that education gives you the opportunity to choose the profession of your own liking.*

(Female, Dried fish producer)

Stories like these reflect how most fishers/dried fish producers see the lack of education as a barrier between them and the rest of the mainland society when it comes to livelihood diversification and stability of life. It was quite evident from the interviews that most fishermen do not want their children to follow fishing and instead they encourage children to get proper education. Indeed, the material circumstances of the community shape their beliefs regarding the importance of education in having a successful life. A review of the beliefs belong to fishers/dried fish producers on the importance of education is depicted in Box 6.2. These comments illustrate that people recognize how education offers hope for future generations.

Box 6.2 Review of the beliefs among fishers/dried fish producers on the importance of education

Education enables a person to:

1) Choose a better profession willingly instead of being compelled to work in a laborious job like fishing from early ages;
2) Gain socialization skills to get in touch with all kinds of people, mostly outside of the community;
3) Express feelings and concerns with confidence in front of other people;
4) Connect with educated people to learn new knowledge and skills from them; and
5) Get to know the rights that a person holds in the society

6.2.1.3 Physical Health

The nature of fishing and the uncertainty of the coastal-marine environment (e.g., strong waves, sudden thunderstorms, etc.) produce many occupational hazards. Marine fishing has been indicated as an inherently dangerous occupation by some researchers (Novalbos et al., 2008; Percin

et al., 2012; Udolisa et al., 2013; Zytoon, 2012). Common injuries that are reported by the small-scale fishers of the island include eye problems from the sun and sea glare, hearing issues caused by the sound of water waves and boat motors, skin problems from exposure to salty water, and respiratory illness from the smoke of boat engine. Fishers have also reported higher cases of accidental injuries (bone fractures, bruises, and finger amputations) and life losses since now they are forced to go deeper into the sea to find sufficient amount of catch. Dried fish producers have experienced skin problems from exposure to salty water and chemicals used during fish processing. Dried fish producers also complained about respiratory problems from unhealthy gas emitted through rotten fish.

Regardless of occupation, good physical health is considered important for everybody, as summarized by one fisher, "not having good health leads to not having income". In addition, unavailability of a professional doctor has been mentioned by the fishers as one of the main health-related concerns of the region. Increasing cases of sickness and accidental injuries have led some fishers to quit the profession in the absence of a proper healthcare system. A fisherman has explained the past and current condition as:

> *Earlier during dried fish seasons, the government used to facilitate the boats and riversides with first-aid arrangements. Also, they used to arrange temporary doctors for the four months [dried fish season]. But now the government has completely withdrawn the facility since those doctors were not medically certified and there was a risk of someone being given the wrong treatment. As a result, we are not getting any treatment at all, as the government does not want to pay for proper doctors. This problem is going on for the past ten years.*

(Male, Fishing business owner)

6.2.2 Assets

Climate change-induced sea-level rise, changing rainfall patterns, and changes in the frequency and intensity of extreme weather events (Sec 5.3.5) have had significant impacts on the islanders in the Sundarbans (WWF, 2010). At the household level, both short and long-term impacts of natural hazards vary depending on the socio-economic status of the affected community, with the poorer strata of the society tending to carry the major share of the burden (Mazumdar et al., 2014). The World Bank (2001) reported that loss of assets could push poor households into chronic poverty as they do not have the necessary income to rebuild houses, replace assets, and cope with negative health outcomes. Regarding the tangible material possessions needed for a good life, the informants reported the following items:

a) Fishing boat and net; and

b) Other assets (e.g., shelter, van, motorbike).

These key assets of the Sagar Island fishers/dried fish producers are described next.

6.2.2.1 Fishing Boat and Net

In Sagar Island, fishers use a variety of equipment, boats, and different types of nets (Table 6.2). However, regardless of the fishing method, the importance of a reliable and powerful fishing boat is widely recognized:

> *Many of the fishermen had abandoned their boats and started to work for those who own better quality boats. Cheaper boats are made out of local timber which is very fragile and lasts up to 2 years, and most of the fisher cannot afford repairmen cost. On the other hand, boat built out of high-quality woods lasts up to 20-30 years. But very few of us can afford such boats.*

(Male, Fishing business owner)

For small-scale fishers, quality of their boat's engine can be a matter of life and death, as described by a male fisher: "If one doesn't have a good engine and it stops working at the middle of the sea, the person will drift away and lose his life". Also, for the fishers, owning a multi-cylinder boat would mean the ability to fish "in the deep". So, what a good quality multi-cylinder boat offers is the opportunity to catch more and fish deeper. It is this added level of financial security (large catch through better boat) that motivates fishers to dream of owning larger multi-cylinder boats. Buying boats and nets are the most stated reasons for obtaining credit from local moneylenders among fishing households of the island.

Table 6.2 Different boat and net types used by the small-scale fishers of Sagar Island

Boat Type	Non-motorized boats especially *Dingi* boats
	Motorized Boats (2-, 4-, 6- cylinder boats)
	Using homemade Styrofoam floating board (*shol*) as a boat
Net Type	Gillnet (*Chhandi*)
	Fixed Bagnet (*Behundi*)
	Drag Shore Seine (*Berjal*)
	Shore stake nets (*Chowrpata*)
	Throw net (*Khalpata*)

Note. Data are from semi-structured interviews and focus group discussions answered by small-scale fishers, dried fish producers, and members of Fishermen Association of Sagar Island.

Results from the surveys revealed that among the surveyed fishing households (n=45) thirty-four have one small boat of 1-4 cylinders capacity [currently active and inactive boats], 5 have two small boats [all active boats], and 3 have large boats of 6-cylinder capacity [all active boats]. Owning a boat on the island does not mean that the owner necessarily is running a fishing business. During the interviews, many participants stated that they alone could not afford the cost of one particular fishing voyage; therefore, they share their boats among family members to offset the cost. Further, fishing is primarily a combined effort, with two to three fishers working together (CARICOM, 2000). In the case of boats with four or less than four-cylinder capacity, the captain of the boat (i.e., the owner) takes 50% share from the profit, and the remaining share is divided among rest of the members. But in the case of 6-cylinder boats, the captain of the boat takes 60% of the share.

6.2.2.2 Other Assets

In Sagar Island, other than one respondent, everyone had their own place of living. But most of these houses were either temporary or poorly constructed. It has been observed that in Indian culture, the kind of house one owns is an important reflector of one's status in society. Therefore, not getting any tangible assistance for better house construction was fishers' second most common grievance after direct monetary help. Few of the respondents did own vehicles like a rickshaw, van, bicycle or motorcycle. The chance of someone owning one of these vehicles was directly proportional to their income.

6.3 Relational Wellbeing

Relational wellbeing refers to the relationships people have and value for living a good life (White & Ellison, 2007). Similar to many other societies, relationships permeate Bengali life in numerous ways (e.g., social, cultural, religious interactions). In many situations, the financial exchange between community members can become crucial for coming out of economic deprivation temporarily. Therefore, maintaining a diversity of networks is crucial. Some of the islanders did acknowledge the same: *"*We all accept that continuing life and fishing business without having a good relationship with each other is impossible. So, building relationships is very important*".* In fact, when surveyed, respondents indicated that having family and friends was one of the topmost requirements for a successful life (Figure 6.1, above). It is important to mention that the growth

and erosion of values and beliefs in relational dimension of SSF and DF production represented in section 4.3.3 are directly linked with the growth and erosion of relational wellbeing among the fishing community members of the island.

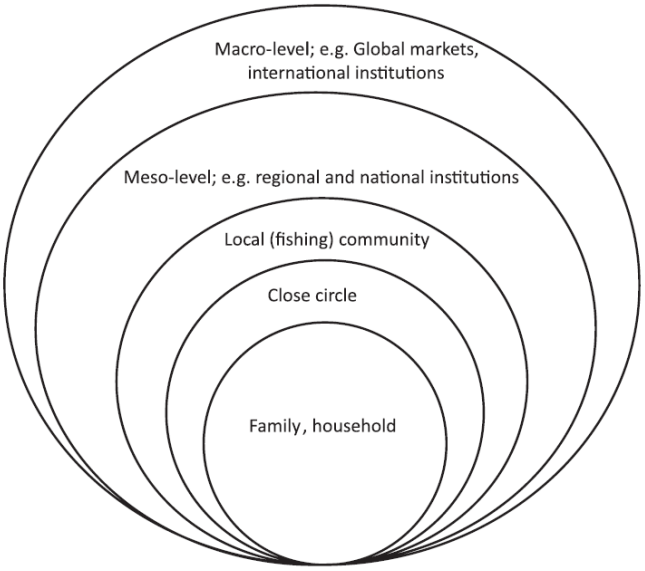


Figure 6.3 The "relational landscape" of relational wellbeing. *Note.* Adapted from Britton & Coulthard (2013).

In this part of the chapter, three aspects (e.g., the types of groups that people identify with) of relational wellbeing are disaggregated into the following sub-sections (Britton & Coulthard, 2013):

1) Local community;
2) Close circle other than family; and
3) Family and household.

These sub-sections describe social relationships, starting from the community level based on the "relational landscape" defined by Britton and Coulthard (2013) (Figure 6.3, above).

6.3.1 Local Community

Relationships among fishing community members influence access to material, and non-material benefits people derive from each other. Understanding the positive and negative contributions associated with the existing relational dimension in a fishing community requires tracing the relations that have been shaped within small-scale fishery, including the interactions amongst community members, boat owners, crews and middlemen (Table 6.3). Some informal rules (e.g., rules regarding sharing catch: Sec 6.1.2) are followed when the captain of the boat (i.e., the owner)

and crew share the catch based on mutual understanding and pre-defined norms.

Table 6.3 Relational dimension of wellbeing among fishing community members of Sagar Island

Relational dimension	Positive contributions to fishing community	Negative contributions to fishing community
Community members	Development of social cohesion values by offering help/lending money to the needy members; Feeling of being a member in 'a single-family'	Erosion of social cohesion values due to the inability of helping each other because of the decrease in fish catch/income; Feeling sympathy for those going bankrupt
Boat owners and crews	Development of sharing culture and reciprocity values; Possibility for income generation through sharing of boats and fishing equipment with those who do not own them	The emergence of social hierarchies; High possibility of going bankrupt for boat owners because of not sharing the boat expenses with crews
Middlemen	Possibility for income generation during various stages of fish trade between fishers and market; Support to acquire necessary supplies for keeping the catch fresh (e.g., ice, storage, vehicle)	Middlemen are perceived to take advantage of fishers by paying low prices for the catch; Increase in the number of people involved in the fish trade process (middlemen) results in fishers getting lower prices for the catch

Note. Data are from semi-structured interviews and focus group discussions answered by small-scale fishers, dried fish producers, and members of Fishermen Association of Sagar Island**.**

Within a community, one individual can belong to multiple organizations and networks such as religious groups, clubs, sports, political parties, gangs, and action groups (White, 2009a). Membership in these groups may depend on multiple criteria, including demographic and psychographic factors. For example, one fisherman described the crossover of employment opportunities provided by a religious network:

> *I met someone during Ganga Puja annual carnival a few years ago. It is during our friendship I came to know about the fishing business in Kerala. When he noticed that I am looking for a job and also willing to shift there temporarily, he introduced me to his fisher friend in Kerala. From then on, I move to Kerala every fishing seasons for work.*

(Male, Fisher in Kerala and Sagar Island)

McKenzie-Mohr (n.d.) mentioned that "behavior change is most effectively achieved through initiatives delivered at the community level" (p. 3). For example, the Fishermen Association of Sagar Island by organizing various knowledge and skill development activities has initiated such change among its members and general fishing community. During the focus group discussion with male fishers, it was revealed that in the past, they wanted to form their own fishing society to

better represent their needs but lacked the know-how and organizational skills to initiate the process. The 'Fishermen Association of Sagar Island' has taken this responsibility very seriously, as its activities include informing the fishing community about new rules and regulations, distributing some supplies (e.g., fishing nets, cycles, motor vans, fish storage boxes) every year through local *panchayat* (local self-government of villages in rural India) to needy households, conveying the needs and expectations of fishers to larger institutions such as governments and NGOs, and organizing religious fairs which help build a feeling of solidarity among community members (Sec 4.3.3). As such, identification of community groups and the relational wellbeing they indicate could lead to an improved management of fisheries resource.

6.3.2 Close Circle Other Than Family

Social circles of community members other than their own family are complex, overlapping, and multi-faceted. The majority of community members noted that in spite of their differences, they all try to stay as one family. Such a tendency is reflected when they refer to each other with titles such as 'brother', 'uncle', and 'sister' without having any blood ties. Sharing of the common fishery resources along with sentiments, values, and beliefs attached to it makes it easier for them to work and cooperate with each other. Marginalization and economic difficulties act as the glue in constructing a strong bond among community members. These days an uncertainty has crept in regarding what could happen to these relationships if the already poor material wellbeing gets worsened.

6.3.3 Family and Household

People's diverse relationships are a key contributor to quality of life. The same was reflected with 38% of the surveyed informants (n=45) choosing 'family and friends' as one of their three top requirements for leading a successful life (Figure 6.1, above). Information gathered from the interviews shows that family cohesion is a crucial aspect of livelihood security in fishery households of the island. The first and foremost coping shield against livelihood adversity arrives in the form of family cooperation. Further, when the father grows old, usually his son takes over his position while offering the father some easy inland job like making or mending nets. Therefore, fishing makes it hard to put distinction between family and business. Within such communities, fishing becomes a family affair, where family members work together to achieve

common goals.

The reduction in the fishery households' income was often compensated by an increased role for women in livelihood strategies. Women in the Sagar Island supplement the household income by catching small fish and shrimps in nearby rivers and participating in dried fish production. Also, this movement has made the 'family business' concept of fishery become more tangible. In Sagar Island, 72% of the respondent fishermen (n=25) fish alongside other family members, while 90% of the female respondents active in dried fish production (n=20) have at least one fisherman in their households.

6.4 Subjective Wellbeing

Subjective wellbeing reflects how one perceives the world, and therefore is a thread through all aspects of life - including both material and relational wellbeing. For instance, while a quantity of money is objective, satisfaction attained with this money is entirely subjective. It is good to mention that the growth and erosion of values and beliefs in subjective dimension of SSF and DF production represented in section 4.3.2 are directly linked with the growth and erosion of subjective wellbeing among the fishing community members of the island. The importance of subjective wellbeing is recognized by White (2009b) as the apex of social wellbeing. In this section, the following components of subjective wellbeing in Sagar Island are examined:

1) Self-identity;
2) Collective Identity;
3) Satisfaction; and
4) Autonomy.

These components were selected based on the results of the interview analysis and were later cross-referenced with the literature on social wellbeing (Weeratunge et al., 2014; White, 2009a).

6.4.1 Self-Identity

Social identity (i.e., the characteristics of one's identity in a social context) is normally a component of relational wellbeing. However, self-identity (i.e., continuous awareness of who you are) is also integral to understanding how people perceive and experience life (Ellemers et al., 2002; White, 2009b). Research of Weeratunge et al. (2014) illustrates that even in the presence of other livelihoods, fishing comprises the core of a fisher's identity. Fishing is not just

a matter of what fishers do but also forms the substance for who they are. Fishing has been passed on through generations in most fishing households of the island. Inheriting the profession and knowledge of fishing hugely impacts the identity of people involved - as some fishers declared, "It [fishing] has been in our blood". Keeping such perceptions in mind, the outcome of a day's work can have a huge impact on social and self-perception. One fisher described feelings of pride after catching a good amount of fish through these words:

> *Still, I feel overwhelmed every time I catch a good amount of fish. More importantly, it is a sign that I will not have trouble supporting my kids in getting an education. It makes me proud!*

Further, experiences collected over the years can leave an impression for life. One fisher shared a story of a near-death experience:

> *My boat has been flipped on several occasions during my fishing career, but one time there was no boat around to rescue me. I stayed in the water for hours and was ready to even die. Eventually, few boats did arrive and rescued me, but I stopped going to the waters from that time. I abandoned fishing.*

Subsequently, while the degree of influence and sentiment may vary, the sea acts as a major reflector of self-identity. Therefore, the transition from the primary occupation of fishing to new livelihoods may require more than just the choices available, as it may require strategies to mitigate the devastating impacts of identity loss (Sec 5.3.7).

6.4.2 Collective Identity

During a discussion about the components of a 'good life', many interview participants brought up aspects of collective identity: "If one member of a community is afflicted with pain, other members will also remain uneasy." In Sagar Island, the concept of 'collective identity' involves a substantial part of a person's individual identity, as each member's sense of belongingness to the community is high. Collective identity here is not only proof of 'social cohesion' value among individuals but also a tool to mitigate the current economic crisis among fishery households. A dried fish producer explained her point of view as:

> *I usually stay connected with my neighbors without considering the existing caste and religious diversity. We are aware that in other parts of India, these differences are creating lots of conflicts. We all are like a family and I think it is a huge positive in our community. I helped my neighbor to pay her debt last month and I know someone will help me when I will need such.*

(Female, Dried fish producer)

For some community members, religion is an important pillar of virtue that impacts their decision-making process and relational wellbeing. For Hindus - the majority of Sagar Island's household (Census of India, 2011) - the virtue of generosity as an outcome of collective identity has been practiced for ages in the form of offerings made to deities with the expectations of getting protection, prosperity and success (Sec 4.2.2). The belief behind this reciprocal relationship is reflected through community's desire to help other members in the expectation of getting help from them in the times of their need - as stated by a fisher, "You need to help to get helped".

6.4.3 Satisfaction

Previous researches have illustrated that life satisfaction and wellbeing are interlinked, with some authors using subjective wellbeing and life satisfaction synonymously. For example, Copestake and Camfield (2009) define subjective wellbeing as "personal satisfaction with the achievement of life goals" (p. 5). Other authors, such as Weeratunge et al. (2014), incorporate satisfaction as a facet of subjective wellbeing. It is important to keep in mind that satisfaction is just an important component of subjective wellbeing and not the only one (there are other components such as autonomy, identity, etc.). When asked about whether fishing provided the life they desired, only 42% of fishers/dried fish producers (n=45) responded affirmatively. Also, during interviews, participants from the community indicated several regrets in their lives. For some fishers, one of these regrets included not being able to attend school (Sec 6.2.1.2) or being denied a childhood: "I was forced to provide money before I could play". Thus, the interview data regarding values and beliefs highlighted congruency with the majority of fishers indicating that they were not satisfied with their lives in general. Hence, it can be concluded that satisfaction is gradually being replaced by a deep sense of desperation and misfortune. It could be one reason behind the fact that unlike their parents, most of the current small-scale fishers are not interested in passing fishery on to their next generation (Sec 5.3.7).

6.4.4 Autonomy

The importance of autonomy and independence for fishers' wellbeing has been explored in some researches (see Britton & Coulthard, 2013; Trimble & Johnson, 2013; Weeratunge et al., 2014). Small-scale fishers lead independent lives since they are usually self-employed. However, we have seen that income from fishing is highly unstable and unpredictable, depending on factors

such as weather, catch amount, etc. There are diverse views among fishing communities of Sagar Island on the benefits of autonomy in fishing. In the island, official jobs (e.g., office work in Fishermen Association, teaching etc.) seem to be comforting for those involved in it: “I am much more comfortable in my current job [Secretary of Fishermen Association]. I am happy that I am involved in a secured job where I am sure I will get my monthly wages, no matter what happens”; versus the juxtaposed view of “There is no boss in fishing. I’m self-employed, and I am happy because I am not getting orders from someone else” from the fishers. Many fishers enjoy fishing because of this autonomy factor: “I’m self-employed and if I want to stay home for a day or two, I can. I don’t have anybody to schedule my own time”.

6.5 Chapter Summary and Conclusion

In this chapter, the three dimensions of social wellbeing are examined: (1) material wellbeing (e.g., livelihood diversity, assets, access to primary resources) (Sec 6.2); (2) relational wellbeing (e.g., social relations, fisher institutions) (Sec 6.3); and (3) subjective wellbeing (e.g., self-identity, living right, satisfaction, autonomy) (Sec 6.4). The review suggests that the fishing community’s priorities on the ‘requirements for a successful life’ (Figure 6.1, above) are aligned with their defined importance hierarchy of values and beliefs that is depicted through chapter 4. Monetary-related requirements are observed to be top priorities for satisfactory quality of life among the fishing community. Throughout the different facets of social wellbeing we have seen that wellbeing of fishers/dried fish producers depends to a large extent on the circumstances of the fishery and fishing community they are part of, their relationships to them, and how they feel about them.

CHAPTER 7
Conclusion

7.1 Introduction

The small-scale fishery in the Sundarbans has not received the research attention it deserves considering the important contribution that it makes to nutrition, food security, sustainable livelihoods, and poverty alleviation. Effective management of fisheries resource along with secured and sustainable livelihoods of fishing households requires an understanding of individual and collective values, beliefs, attitudes, expectations, and needs to guide through planning decision making. This thesis presents an empirical investigation of the diverse values and beliefs hidden in small-scale fishery and dried fish production of Sagar Island by focusing on their connections with social wellbeing of the fishing community. In this chapter, a summary of key findings, discussions, and areas for future research is presented. The discussion includes three objectives of this thesis, a summary of relevant points from chapters and some of the key figures. Finally, I conclude this chapter with a review of the gaps and opportunities for future research related to the area of the study.

7.2 Objective One

Identifying the diverse values and beliefs and their meanings that are hidden in the small-scale fishery (SSF) and dried fish (DF) production community groups

In recent times, a growing number of life loss and economic loss experienced in SSF and DF production have made community members realize the need for ecosystem conservation. The importance of 'ecosystem conservation' and 'ecological knowledge' is quite evident among those who are under the direct influence of it or have been informed about the changes. Also, there is a huge difference between how male and female members value ecosystem conservation. The findings suggest that the related values start developing in a society when fishing members realize that failure to protect the natural environment will lead to the destruction of the resources on which their lives depend. While male members are fully aware of the ecosystem conservation and its vital connection to their livelihoods, most of the females were unsure about the recent changes in the ecosystem and the urgent need for its conservation. This contrasting scenario is a reflection of broader societal issues involving gender in Sagar Island. Lack of knowledge and awareness among

women regarding the environment and the associated causes originated from the low average rate of literacy, lack of socialization with others outside of their households, and in some cases lack of proper relationships within the households. Further, these factors can also explain the reason behind almost no role in the decision-making process within and outside of the households.

While assessing the level of importance to values and associated beliefs, both male and female fishing members in Sagar Island acknowledged 'peacefulness', 'equality', and 'benevolence' as the values of high importance. The necessity of having emotional and financial supports from within the community also showed significant importance for members, as was acknowledged in more than 90% of interviews. Some of the benefits provided by these supports include the ability to borrow money, food security, enjoyment from community socialization, and psychological reliance of being rescued in the case of an accident in the water while fishing. Male and female members gave high rank to 'equality' by referring to the fishery resources as commons which must be accessible equally to everyone on the island. These members have realized that failure to accept and treat properly those outside the extended primary group (outsiders) will lead to life-threatening conflicts.

While assessing 'moderation', 'honesty', and 'conformity' values, female members put low importance to these values in fishery, contrary to their male counterparts. The interviews suggested high awareness among male members regarding the impact of 'catch amount' and of following the fisheries governing system on the overall survival of SSF and the coastal economy itself. Hence, male members gave high priority to 'moderation', 'honesty', and 'conformity' and low priority to 'freedom' value. Some of the male fishers were also aware of the low impact of the small-scale fishery on the ecosystem in comparison to fishing trawlers. On the other hand, female members lacked the awareness regarding the environment and the possible damages caused by over-intensive fishing or non-compliance of the fisheries governing system. Females did identify equal fishing opportunity among fellow fishers and freedom in deciding when and where to fish as the solutions to meagre catch in the sea. The lack of awareness among the female members is originated from the predominantly patriarchal and patrilineal system in the society of Sundarbans that causes low average rate of literacy and high social deprivation appears among females.

When it comes to 'spiritual wellbeing', the male members perceive the following of traditional beliefs and rituals as part of their routine activities. Every activity in the community, from buying new boats, going to sea in the morning, or opening the fishing season - is performed

after a religious ritual, either individually or in the group. Hence the importance of 'spiritual wellbeing' value is unquestionable, but male members do not perceive it as the most important value in the fishery. Fishers who fail to follow certain traditions or rituals as prescribed in their religion due to their preference for a lifestyle, in accordance with their economic activities, face psychological obstruction (e.g., feeling guilty, stress, anxiety and depression). This shows that choosing an action that promotes one value (e.g., vigorously pursuing wealth) may contravene or violate a competing value (sacrificing religion) and have practical, psychological, and social consequences.

It is interesting to observe that 74% of female members (n=20) associated the reduction in the number of fish or the rise in accidental deaths to religious beliefs. This is a key finding in order to understand how people rationalize the events for which they have no logical explanation. Further, seeking refuge and blessing for life's protection and economic prosperity by wearing specific items is found to be practiced mostly among those female members whose husbands were going out to sea. Such tendency among female members can be a reflection of perceiving deities as manifestations of power - to protect, destroy, or prohibit - rather than of sacredness for the sake of spiritual elevation.

Speaking about 'hedonism' as a value that is derived from pleasure and satisfaction, male members attached relatively high importance to it in fisheries, whereas for females it stood insignificant as their involvement in dried fish production came more out of economic compulsion. Only forty-five per cent of the male members (n=25) and a very small number of females felt complete enjoyment and pleasure towards fishing. In most of the cases, dissatisfaction grew due to factors such as instability of income, fear of losing life and physical health, and compulsion towards continuing the occupation (fishing). At the same time, the majority of both male and female members did acknowledge the biggest contributions of their professions to their lives, which is creating strong momentum in bringing the community together.

Coming to the value of 'self-esteem', the findings derived from male members suggest that fishery in the island does not only bring pride to most of them (e.g., proud of working independently without having an employer) but it also acts as a defense mechanism to balance out the harsh nature of the profession. On the other hand, female respondents mentioned that they are grateful for having an additional source of income in dried fish production, but at the same time, they do not put high importance on this value. It shows that despite enhancement in women's

social status in the community because of their involvement in DF production, the impact of social deprivation is long-lasting enough to not let women perceive the profession as a source of self-esteem or hedonism. The existing predominantly patriarchal and patrilineal system in the society of Sundarbans, where the activities are mainly controlled by men and social deprivation is high among women, has caused erosion in different values among women. As a result, there is a remarkable difference prevalent in 'influence' value between male and female members. Unlike males, the majority of females did not demonstrate having a sense of leadership or a crucial role in the decision-making process. On the other side, male members believed that the decision-making process should be managed by them only, both in society and in households, to achieve a good life.

In assessing values among the fishing community, the vital importance of 'wealth' and 'secure livelihoods' values were acknowledged by all of the interviewees, both male and female. The amount of debt to local moneylenders (*Aratdaar*) and ability to pay it off was noted as a determining factor of the economic situation among fishing households. Likewise, the debt and its associated contract acted as undesirable glue holding the fishers/dried fish producers attached to the profession and the place. These findings suggest that all the activities, relations, and emotions prevalent within the community are controlled directly or indirectly by the sudden changes in the economic situation of the households. For example, lack of life satisfaction and deterioration of mental health were noticed much more among those who had lost their family business and recently became daily wage laborers than those who have been daily wage laborers right from the beginning. It implies that the adaptation to sudden economic changes is harder financially and mentally in the households that are used to having a good economic status.

Participant observations and semi-structured interviews reveal that fishery of the island has been a 'character of the community' and that all other practices, ideas, identities, values and beliefs are shaped based on it. Moreover, it is interesting to note that the community's current economic uncertainties, challenges, and problems have led its members towards positives such as strong union and solidarity. The community has realized that to overcome the current challenges they need each other's support. Also, the challenges have been some of the main drivers for the individuals to continue the fishing tradition and stay attached to the place. It suggests that the fishery acts like a glue that holds the community together and the communities' whole perception towards the rest of the world flows through their inter-generational involvement with the fishery.

Therefore, the fishery has become an inseparable part of their lives which demands greater public recognition.

The high importance of 'attachment to place', 'social cohesion', and 'social recognition' values among fishing communities suggests the sense of belongingness in the island and high inclination towards community-based unity. It gets reflected through the lack of conflicts among followers of different faiths and grows through the rich tradition of syncretism (the combination of different religions, cultures, or ideas). Cutthroat competition caused by the arrival of industrial fishing and an increased number of small-scale fishers, in a livelihood already infamous for its harsh weather conditions, has dented people's belief regarding the future of SSF and DF production. As a result, male fishers do not give high importance to 'tradition' value because of an insecure future when it comes to passing fishery on to the next generation. This implies that the tradition of transferring the family business from one generation to the next is losing the centrality that may have existed sometime in the past among the fishing communities. On the other hand, 'tradition' was strongly desirable for female members as they believed that involvement in DF production has made them socialize better and given them more opportunity for proper education, stating that many young women are taking an interest in tradition of post-fishing activity. The inventory of 20 distinct value types studied in this research and the importance hierarchy of them among male and female fishing members is depicted in Figure 7.1.

The undermentioned set of value types are suggested by Song & Chuenpagdee, 2015 and Song et al., 2013 as the most widely discussed or potentially important values in fisheries governance research. As shown below in Figure 7.1, Song et al. (2013) have categorized these twenty distinct thematic value types into four broader categories, namely, (1) 'better world' which implies what is desired for the world and broader society; (2) 'good life' which includes what is desired for an individual's satisfaction; (3) 'personal virtues' which means desired virtuous inner qualities of a person and; (4) 'outward aspirations' which includes desired relationships with humans or objects outside of self. This categorization is according to desired virtues of society and inner self. The initial values schemes introduced by Schwartz (1990, 1992, 1994) analyze these human values according to their value clusters (e.g., universalism, power - Sec 2.3.1) to identify the possible social conflicts and congruence among values. Hence, Schwartz (1992, 2006) formed a circular structure (Figure 2.1 in Sec 2.3.1) to show while the adjacent value types are in congruence (jointly preferred), values on the respective opposite side of the circle are in conflict.

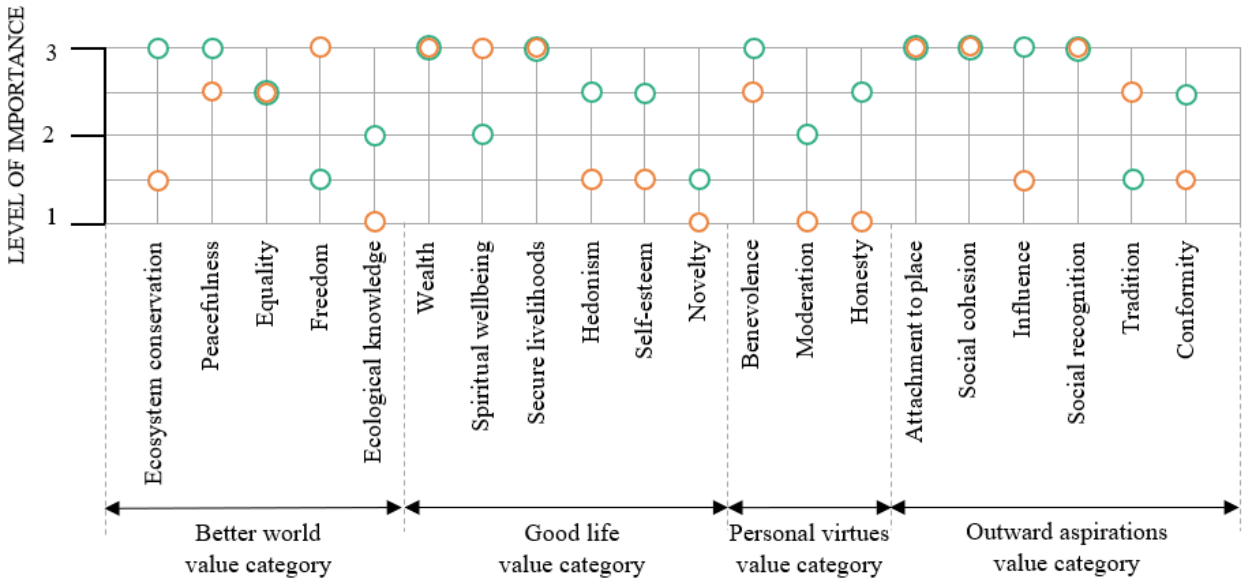


Figure 7.1 Importance hierarchy of diverse values in the small-scale fishery and dried fish production of Sagar Island based on the male [green] and female [orange] fishers and dried fish producers who judged each value (note that 1 implies 'not important', 2 implies 'somewhat important', and 3 implies 'very important').

Note. Data are from household surveys answered by fishers and dried fish producers of Sagar Island

LEGEND

Male members

Female members

Male and Female members both

In this research, I tried to define the conflicts and congruences among values and beliefs of male/female members of the fishing community in Sagar Island by using Song et al.'s values inventory and prototypical model of Schwartz's value structure (Figure 7.2; Figure 7.3). As explained before (Sec 2.3.1), actions in pursuit of any value can have practical, psychological, and social consequences that come in conflict with some values, while are in congruence with others. In fisheries governance, having high numbers of conflicting values would not only make the current issues in the governance persist, but would also contribute to lower governability. Therefore, conflicting values in any of the abovementioned value categories (e.g., better world value category) would force the value holders to deal with social conflicts in that specific virtue of society or inner self (e.g., desired virtues for the world/broader society).

The structures of values among male members of the fishing community in Sagar Island and multiple interactions within it (Figure 7.2) demonstrate that the values in the self-

transcendence side (e.g., ecological conservation, peacefulness) are in congruence with each other, but are in social conflict with values in the self-enhancement side (e.g., wealth, influence). Male members need to assign high value either to the protection of the welfare of all people and for nature (self-transcendence side), or to the dominance over people and resources (self-enhancement side) to avoid being faced with possible psychological and social consequences while dealing with their preferences in these values. As a result, seeking dominance for self (e.g., influence) would tend to obstruct actions aimed at granting equality to others (e.g., peacefulness) or vice versa.

Further, 'tradition' value among males comes in conflict with its adjacent values ('social cohesion' and 'conformity'). I have already mentioned in previous chapters how social cohesion and conformity have always been on the rise when it comes to Sagar Island's small-scale fishers and dried fish producers, whereas 'tradition' value has seen a decline among males. 'Tradition' value in this case (e.g., encouraging young people to continue fishing tradition) does not serve to permit cohesion among the members of the fishing community ('social cohesion' value) and acceptance of fishery norms, rules and regulations ('conformity' value) causing social conflict as a result. Moreover, the 'novelty' value which could bring enjoyment and pleasure to the society is considered a less important value among males, thereby causing conflict with the 'hedonism' value as a result. On the other side, the low importance given to 'freedom' and 'novelty' values is in congruence with 'conformity' and 'public recognition' values in their opposite side. This is derived from the fact that less freedom in deciding when and where to fish ('freedom' value) along with creativity in fishing method ('novelty' value) would lead to acceptance of fishery rules and regulations ('conformity' value) and will ensure greater public recognition of fishing work eventually ('public recognition' value).

All the gender differences and gender relations mentioned throughout the case study of this research are the outcome of the predominantly patriarchal and patrilineal socio-cultural construct (structures, institutions and practices) of Sundarbans, where the activities are mainly controlled by men and the properties are mainly owned by men. This mechanism makes the women second-class citizens, subordinates the potential of social leadership and social position (poorly represented in policy and decision making), causes social deprivation among them, lessens their control over income and assets, limits their access to different kinds of resources (e.g., fishing, education), and makes inconsistent socially determined values and beliefs among male and female members of the society. It is an optimistic view that in the case of Sagar Island, dried fish production has broken

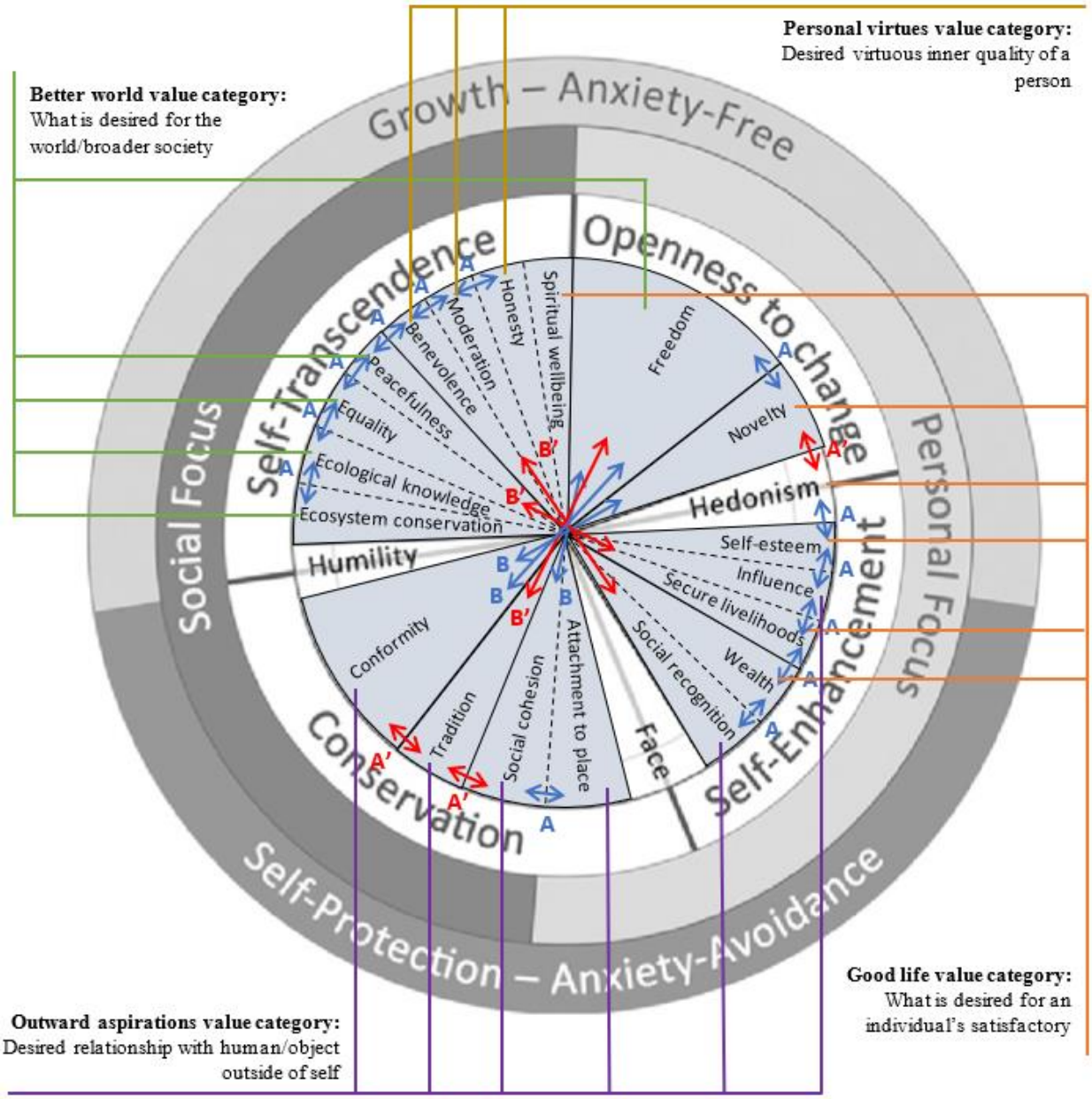


Figure 7.2 Structure of values among male members of the fishing community in Sagar Island

LEGEND

A ↔ Values are in congruence with the adjacent values as both experience growth (+) or erosion (-) among members

A' ↔ Values are in conflict with the adjacent values as one experiences growth (+) and other experiences erosion (-) among members

B ↔ Values are in congruence with the values on the respective opposite side as one experiences with growth (+) and other experiences with erosion (-) among members

B' ↔ Values are in conflict with the values on the respective opposite side as both sides experience growth (+) or erosion (-) among members

up some patriarchal traditions in the society by providing an opportunity for women to socialize with people outside of their households. This process could lead to further progress among female members of the society.

The structures of values among female members of the fishing community in Sagar Island and multiple interactions within it (Figure 7.3) demonstrate a higher frequency of social conflicts both between the adjacent values and between the respective opposite side values (Figure 7.3). As mentioned earlier, one of the main reasons behind this conflict is the existing social deprivation and apparent lack of awareness in females about the environment and the real situation of their livelihoods. To give an example of the conflicts that exist in the values among females, 'benevolence' value (e.g., concern for the welfare of other fishing workers) is in congruence with 'peacefulness' value (e.g., fishing villages without conflicts), but causes social conflict with 'moderation' value (e.g., moderate catch target) as 'moderate' value among female members is eroded. This is because if a fishing community is in favor of peacefulness and benevolence among its members, it should be in favor of sustaining moderate catch amount to protect the welfare of community members also. Further, 'benevolence' causes social conflict to give the high economic income from fishing work ('wealth' value) and greater public recognition of fishing work ('social recognition' value) the priority. It is because pursuing values that place self over people and resources such as 'wealth' or 'social recognition' may harm or exploit others and damage social relations. To give another example, 'secure livelihood' is in congruence with 'ecological knowledge' and 'ecosystem conservation' among females, because giving the high priority to securing livelihood should lead to a low importance on ecology. On the other hand, 'secure livelihood' conflicts with 'influence' value (strong leadership in fishery management) because securing livelihood in a community demands a strong sense of leadership within its members. The summary of the main findings in the objective part of this thesis has been presented in Box 7.1.

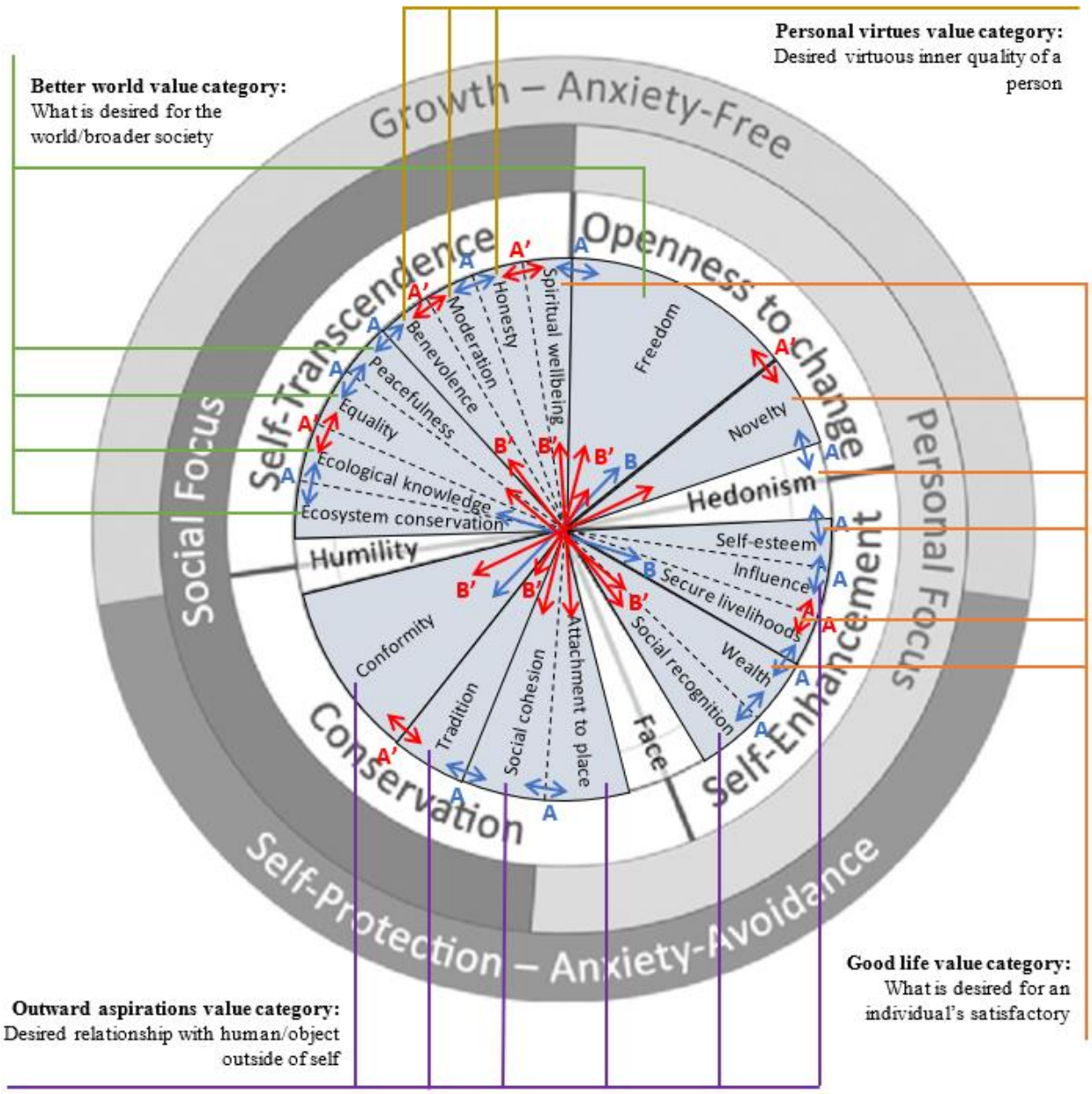


Figure 7.3 Structure of values among female members of the fishing community in Sagar Island

LEGEND

A ↔ Values are in congruence with the adjacent values as both experience growth (+) or erosion (-) among members

A' ↔ Values are in conflict with the adjacent values as one experiences growth (+) and other experiences erosion (-) among members

B ↔ Values are in congruence with the values on the respective opposite side as one experiences with growth (+) and other experiences with erosion (-) among members

B' ↔ Values are in conflict with the values on the respective opposite side as both sides experience growth (+) or erosion (-) among members

Box 7.1 Summary of the main findings of the objective one

1) A growing number of life loss and economic loss experienced in small-scale fishery and dried fish production of Sagar Island has made community members realize the need for ecosystem conservation. This realization is among those who are under the direct influence of it or have been informed about the changes.

2) While male members are fully aware of the ecosystem conservation and its vital connection to their livelihoods, most of the females were unsure about the recent changes in the ecosystem and the urgent need for its conservation.

3) Lack of knowledge and awareness among women regarding the environment and the associated causes originated from the low average rate of literacy, lack of socialization with others outside of their households, and in some cases, lack of proper relationship within the households.

4) Most of female members associated the reduction in the number of fish or the rise in accidental deaths to religious beliefs because they need to rationalize the events for which they have no logical explanation.

5) All the activities, relations, and emotions prevalent within the community are controlled directly or indirectly by the sudden changes in the economic situation of the households.

6) The community's current economic uncertainties, challenges and problems have led its members towards positives such as strong union and solidarity.

7) The interactions of values held by female members of the fishing community demonstrate a higher frequency of social conflicts between the values in comparison to male members. These conflicts could have psychological and social consequences among community members.

8) Prevailing patriarchal and patrilineal in society of Sundarbans create inconsistent values among male and female members of the society.

7.3 Objective Two

Defining the key drivers of values and beliefs and how they have affected the values and beliefs of the SSF and DF production community groups

The small-scale fishery in the social-ecological system (SES) of the Indian Sundarbans is influenced by drivers at multiple levels, resulting in a range of positive or negative impacts in the system that affect the values and beliefs of fishers and dried fish producers. Each proximate driver (actions at the local level) of social-ecological regime shift is impacted by a combination of distal drivers (fundamental factors) and makes a diverse set of impacts on values and beliefs of Sagar Island. The social-ecological system of the Indian Sundarbans and the communities falling under its direct influence are under pressure from multiple drivers of change threatening the system's

own survival.

The findings confirm that the issue of poverty in fishing communities links to a wide range of factors other than income, including access to natural resources, land ownership, debt, access to health, education and financial capital, and marginalization from political decision-making. The decline in overall fish stocks and the catch per unit effort has resulted in meagre earnings for the fishers, compelling many to fish in prohibited areas, sometimes even near the Indo-Bangladesh border. Ninety-five per cent of the informant households are interacting with local moneylenders (*Aratdaar*) as they have taken short-term loans as a coping strategy. More layers of intermediaries (*fode*) are also involved between small-scale fishers/dried fish producers and fish market than before.

The trade (fish to money) between fishers/dried fish producers and the local moneylenders and middlemen is highly skewed to the disadvantage of the former. The ratio between household income and the size of the loans shows that the economically poor fisher and dried fish producer families will continue to stay trapped in the vicious cycle of indebtedness for years and maybe for coming generations as well. Moreover, fishing trawlers have emerged as the biggest menace in the list of anthropogenic disturbances in the Sundarbans during the last two decades, leading to depletion of fish stock. Consequently, these processes suggest that the fishers and dried fish producers already dealing with poverty and marginalization have been sent to the brink of their survival.

Caste and religious identities are not a determining factor of access to resources and opportunities in the Sundarbans region. The proximity of different religions, castes, and indigenous and immigrant households in the region imply the existence of shared cultural and livelihood practices. Further, the villages are in remote areas, with minimal access to education and health facilities. The remoteness and transportation constraints existed between the island and the mainland, including the market spots, are some of the factors for the poor development of the region. The underdeveloped situation of the area becomes economic, social, and political drivers that have led fishers and dried fish producers to feel marginalized and alienated from their place of work. It is notable that occupational identity in the island is not based on any ascribed status like caste and religion, but instead, people associate their identities to traditional livelihood practices while further relying on the recognition of customary rights as a tool of legitimization.

Evidence from this research shows that the diverse challenges that existed in the island are

leading community members towards more temporary migration for the sake of finding more reliable livelihood options. Although this diversification of income sources helps fishery households in combating the deteriorating financial condition, it also weakens the traditional notion of local 'fishing community' and 'fisher family' (e.g., refusing to pass the profession from one generation to other). This process could gradually lead to complete human-environment disconnection in further stages and would only give rise to more vulnerability in the community. In case it happens, the gradual loss of fishing-based livelihoods, a high number of subsequent out-migration, and loss of environmental knowledge and a sense of stewardship among the small-scale fishers/dried fish producers will be witnessed and will adversely affect human wellbeing.

The findings further highlight the flaws of the prevailing model of resource management in India, which is top-down, with centralized decision-making. The actual threats for the fragile ecosystem of the region are derived from the pollution caused by developmental activities, including industrial pollution and sewage discharged from the mainland. The findings confirm that the existing conservation policies and diverse regulations carried out by both the central and state governments are by no means constructive - neither for the people nor for the environment. What has been observed is that the creation and management of marine and coastal areas happen mostly without the participation of resource users, especially small-scale fishers. As a result, key policy actors of the Sundarbans at both the state and district level lack clarity and awareness about the local impacts of global climate and socio-economic changes in coastal areas and also about the coping mechanism used by the islanders. These results demonstrate some of the limitations of conventional fishery conservation approaches. First, there is no scientific study of fish stock management within the Sundarbans region, as the fishery-related officials are not involved in doing a stock assessment because of some internal political reasons. Second, the fish banning season and the allowance programs associated with it have not been updated by officials based on current seasonal trends and community requirements. These limitations could explain why the livelihood of the fishers has become so difficult, often leading them to violate the norms and regulations more than they would otherwise have done. The summary of the main findings in the objective two of the thesis has been presented in Box 7.2.

Box 7.2 Summary of the main findings of objective two

1) The ratio between a household's income and the size of the loans they have taken shows that the economically-poor fisher and dried fish producer families will continue to stay trapped in the vicious cycle of indebtedness for years and maybe for coming generations.

2) Fishing trawlers have emerged as the biggest menace in the list of anthropogenic disturbances in Sundarbans during the last two decades, leading to depletion of fish stock.

3) Caste and religious identities are not a determining factor of access to resources and opportunities in the Sundarbans region.

4) Occupational identity supersedes religious or caste identities and makes them irrelevant. Therefore, climate change impacts fishing productivity and occupational structure of the community.

5) The diverse challenges that existed in the island are leading community members towards more of a temporary migration for the sake of finding more reliable livelihood options. This process weakens the traditional notion of local 'fishing community' and 'fisher family' and could gradually lead to complete human-environment disconnection in further stages.

6) The existing conservation policies and diverse regulations carried out by both the central and state governments are by no means constructive - neither for the people nor for the environment.

7.4 Objective Three

Examining how the values and beliefs of the SSF and DF production community groups are connected to their social wellbeing (i.e., material, subjective, and relational wellbeing)

The responses to the question about the 'top three requirements of a successful life' have shown that money, education, and reliable job (all part of material wellbeing) are the three most important picks chosen by the informants. This suggests that for most of the fishery households on the island, the relationship between income and social wellbeing is very strong as most of the time, they are trapped in poverty. During the off-season when fish availability is low, most of the fishers on the island go searching for whatever temporary jobs they can find to cope with the livelihood crisis. The majority of fishers/dried fish producers see the lack of education as a barrier between them and the rest of mainland society when it comes to livelihood diversification and stability of life. These findings explain why most fishermen do not want their children to follow fishing and instead prefer that their children become better educated.

The nature of fishing and the uncertainty of the coastal-marine environment produces many occupational hazards. Fishers have reported higher cases of accidental injuries and life losses since

now they are forced to go deeper into the sea to find a sufficient amount of catch. Increasing cases of sickness and accidental injuries have led some fishers to quit the profession in the absence of a proper healthcare system. The results demonstrate that at the household level, both short and long-term impacts of natural hazards vary depending on the socio-economic status of the affected community, with the poorer strata of the society tending to carry the major share of the burden. It means the loss of assets could push poor households into chronic poverty as they do not have the necessary income to rebuild houses, replace assets, and cope with negative health outcomes. In many such situations, the financial exchange between community members can become very crucial for the recovery or even temporary relief. Therefore, building and maintaining a diversity of network is crucial for the community members. It shows that relationships among fishing community members influence access to material and non-material benefits that people derive from each other. Moreover, sharing of the common fishery resources along with sentiments, values and beliefs attached to it makes it easier for the members to work and cooperate with each other. As mentioned in previous sections, marginalization and economic difficulties act as the glue in constructing a strong bond among community members. However, it is difficult to explain what could happen to these relationships if the already poor material wellbeing gets worse.

At the family level, the findings show that family cohesion is a crucial aspect of livelihood security in fishery households of the island. The first and foremost coping shield against livelihood adversity arrives in the form of family cooperation, where family members work together to achieve common goals. Moreover, the reduction in the fishery households' income was often compensated by an increased role for women in livelihood strategies. It has become a common feature nowadays to see women in the Sagar Island supplement the household income by catching small fish and shrimps in nearby rivers and participating in dried fish processing. Consequently, fishing has become a family affair, and it is hard to differentiate between family and business.

The results of this research highlight that even in the presence of other livelihoods, fishing comprises the core of a fisher's identity. In other words, fishing is not just a matter of what fishers do but also forms the substance for who they are. Fishing has been passed on through generations in most fishing households of the island. Inheriting the profession and knowledge of fishing hugely impacts the identity of people involved. Therefore, the transition from the primary occupation of fishing to new livelihoods may require more than just the choices available as loss of identity can lead to devastating impacts. Further, the concept of 'collective identity' involves a substantial part

of a person's individual identity, as each member's sense of belongingness to the community is a culmination of that itself. The results further show that collective identity here is not only a reflection of 'social cohesion' value among individuals but also a tool to mitigate the current economic crisis among fishery households. The summary of the main findings in the objective three of the thesis has been presented in Box 7.3.

Throughout the different facets of social wellbeing approach, we have seen that wellbeing of fishers/dried fish producers depends to a large extent on the circumstances of the fishery and fishing community they are part of, their relationships to them, and how they feel about them. Figure 7.4 maps a set of commonly described values and facets of wellbeing in small-scale fishery of Sagar Island onto a circular grid based on empirical data of this research (see conceptual framework in Sec 2.5) that links the dimensions of social wellbeing and values to three expanding scales of analysis. The placement of the values and facets is indicative rather than precise, merely aiming to suggest plausible locations for the different values and facets in the context of SSF and DF production in Sagar Island. The figure draws attention to the multiple ways that values and beliefs are bound up with the wellbeing of people. The categorization of each dimension should not be seen as a strict association, as each dimension will also have connections to the other dimensions of wellbeing. Therefore, even though the figure does show that values and facets may relate to two dimensions of wellbeing, it cannot show situations where all three dimensions are relevant. Thus, the most relevant dimensions are chosen by taking into consideration that values and facets can flow freely along the circular grid to change their position.

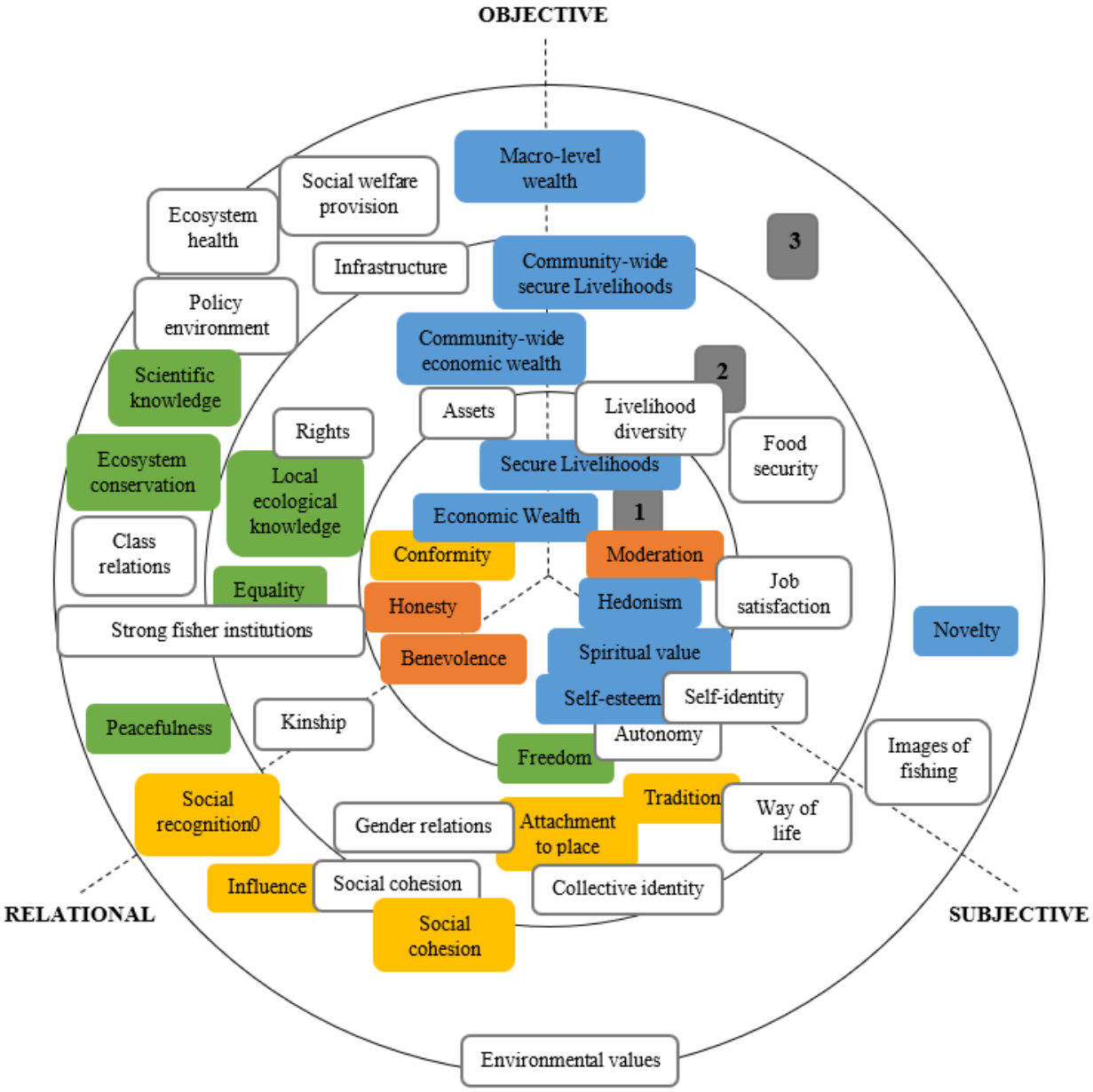


Figure 7.4 Values and facets of social wellbeing in SSF and DF production of Sagar Island

LEGEND:

- Facet of social wellbeing
- Better world value category
- Good life value category
- Personal virtues value category
- Outward aspiration value category

1: Values & Facets of social wellbeing in micro-level of scale (Fisher/Dried fish producer individual, household)

2: Values & Facets of social wellbeing in meso-level of scale (Fishing village/Community)

3: Values & Facets of social wellbeing in macro-level of scale (The general public/Government)

Box 7.3 Summary of the main findings of objective three

1) For most of the fishery households on the island, the relationship between income and social wellbeing is very strong as most of the time, they are trapped in poverty.

2) The majority of fishers/dried fish producers see the lack of education as a barrier between them and the rest of mainland society when it comes to livelihood diversification and stability of life. Therefore, most fishermen do not want their children to follow fishing and instead prefer that their children become better educated.

3) Fishers have reported higher cases of accidental injuries and life losses since now they are forced to go deeper into the sea to find a sufficient amount of catch.

4) Relationships among fishing community members influence access to material and non-material benefits people derive from each other.

5) The first and foremost coping shield against livelihood adversity in fishery households arrives in the form of family cooperation, where family members work together to achieve common goals.

6) Fishing is not just a matter of what fishers do but also forms the substance for who they are even in the presence of other livelihoods.

7) Social wellbeing of fishers/dried fish producers depends to a large extent on the circumstances of the fishery and fishing community they are part of, their relationships to them, and how they feel about them.

7.5 Gaps and Future Research Potential

This thesis has studied the diverse values and beliefs within the SSF and DF production in Sagar Island and their connections with the social wellbeing of the fishing community. This has helped us to understand what matters to the people and what is desirable to the targeted society. The thesis points to several opportunities for future research which include:

1) Longitudinal studies on the same area to understand the impacts of 'time' on the changes in values and beliefs and facets of social wellbeing and their connections;

2) Additional case studies on the connections between 'values and beliefs' and 'social wellbeing' in other coastal areas of the Sundarbans to build upon empirical evidence and to identify trends;

3) Application of the values and beliefs and social wellbeing conceptual framework to small-scale fishery/dried fish production in different contexts; and

4) Strategies on how to identify values and facets of social wellbeing in marginalized communities in the early stages of their deteriorations to prevent social conflicts.

First, longitudinal studies on the same area would not only enlighten how values and

beliefs, facets of social wellbeing, and their connections alter, over 'time', in response to social-ecological system changes, but could also explore the role of values and beliefs as a driver of change within the system. Moreover, it could also provide a better framework that encompasses other values, wellbeing facets, and their relevant drivers that are not indicated in this thesis.

Second, additional case studies on the connections between 'values and beliefs' and 'social wellbeing' in other coastal areas of the Sundarban area would not only contribute empirical breadth, but could also serve as evidence that more 'bottom-up' governance approaches - in the sense that these approaches would involve all actors, and not just members of the local elite - could produce better social wellbeing outcomes. The consensus from multiple case studies could provide impetus to re-evaluate governance of SSF/DF production in the Sundarbans and the West Bengal, more broadly.

Third, the conceptual framework for this thesis may be harnessed for use in other contexts - for example, in studying SSF/DF production governance in other regions, or in studying the management of terrestrial resources, such as forestry.

Fourth, while there have been issues related to deteriorations of values and wellbeing and social conflicts identified in this thesis, I offered no practical strategies to resolve this issue. Future research could seek to address this problem by identifying the drivers that cause values and wellbeing deteriorations in the context of small-scale fishing communities and which may enable us to formulate a coping mechanism to overcome these. For example, the majority of women participants in my case study expressed a lack of knowledge and proper education to be able to make any sense out of what is happening to the ecosystem they are part of and how their wellbeing is affected by it. Additional researches could develop consultative tools and participatory mechanisms that better facilitate the articulation of concerns, needs, and ideas of different actor groups.

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Appendix A

Semi-structured Interview Guide

Question Set 1: Objective One

- What are the reasons behind your ranking regarding [refer to question set 2 in the household survey]?
  - Ecosystem conservation - Peacefulness - Equality – Freedom - Ecological knowledge ('Better world' value category)
  - Wealth - Spiritual wellbeing - Secure livelihoods - Hedonism - Self-esteem – Novelty ('Good life' value category)
  - Benevolence – Moderation – Honesty ('Personal virtues' value category)
  - Attachment to place - Social cohesion - Influence - Social recognition - Tradition – Conformity ('Outward aspirations' value category)

Question Set 2: Objective Two

- What social and/or environmental changes have you seen occurring in your region in the past ten years?
  - What do you think is causing these changes (if any) to occur?
  - What is the extent of impacts caused by the changes you identified? (spatial scale - local: individual/household/community of Sagar Island; regional: Sundarbans/West Bengal; National: India; worldwide)

- How do you derive your livelihood from the fishery resource?
  - What is your household's source(s) of income (wages and salary, capital and investment earnings, government allowance, people in charge of providing them)?
  - What actions you take to overcome financial tensions?
  - What are the factors (regulations, norms, nature, etc) impacting your asset and source of income?
  - Do you feel that you are using more time or resources to meet your needs than you used to?

- What is the pattern you used to follow and currently follow in your livelihood for catching/producing fish?
  - Which months of the year you catch/produce the most and least number of fish/dried fish?
  - What is the process of your catching/producing fish and preserving the products (i.e., the kind of boats/nets you earlier used to employ and how they have changed now)?
  - How do you get paid (division of share within crew members, written contract, etc.)?

- What aspects of your community give you a good quality of life?
  - What should be improved in the community to give you a good quality of life?
  - Are you involved in any way with the management and decision making of the community resources (fishery, infrastructure, education, etc.)? If yes, what types of activities are you usually involved in?

- What factors, if any, do you think are stopping/preventing the full participation of the community members in the management and governance of the resources?
- Are there better ways to enhance or facilitate local peoples' participation?

Question Set 3: Objective Three

- Why you have named the three requirements that you have mentioned [refer to question set 3 in the household survey]?

- In your community, tell me about the most important people to you (on a personal level, friends, family, and on a professional and economic level); you do not need to name this person.
  - Why they are important to you?

- Is being a fisher/dried fish producer gives you the quality of life you want?
  - If you were told that you could no longer be a fisher/dried fish producer, what are three emotions that you would feel? Elaborate on some of these feelings.
  - How do you feel if your kids do not continue this profession?

- At this moment in time, do you feel safe and secure? (economic situation, your relationships, the security of your home)
  - How has the fishery/dried fish production impacted your feeling of safety and security?
  - How the environmental/ecological changes you identified have impacted you/your household/your community? (In terms of wellbeing, livelihood, coastal resource use, sense of place, social and cultural identity, etc.)?
  - What actions you take when facing with financial tensions?

- Is there anything else you would like to tell me?

Appendix B

Focus Group Discussion Guide

- What according to you the most significant social/environmental changes you have seen occurring in your community in the past 10-20 years?
  - Why you think these changes have been occurring?
  - What are the consequences you think these changes have had on you and your community?
  - How you envision your community 10 years from now?

- What are the top requirements you think you need for a good quality of life in your community?
  - What should be done for assuring the access to those requirements?
  - In what extent the community is responsible for assuring those requirements?

- What are the positive and negative contributions of fishery/dried fish production to the community of this region (income, relationships, etc.)?

- Based on your own knowledge what do you think is required for effective governance of fishery/dried fish production in this region?

- What do you think about the findings [sharing some key findings derived from during semi-structured interviews]?

- Is there anything else you would like to tell me?

Appendix C

Household Survey Guide

Question Set 1: Demographics

1) Gender:
   a) Male
   b) Female

2) Age range:
   a) 18-25
   b) 26-35
   c) 36-45
   d) 46-55
   e) 56-65
   f) 66-75
   g) +76

3) Legal marital status:
   a) Single
   b) Married
   c) Divorced
   d) Widowed

4) Migration status/ Ethnic identity: _____

5) Religion:
   a) Hindu
   b) Islam
   c) Christianity
   d) Other: _____

6) Level of education:
   a) Illiterate
   b) Class 1 to 6
   c) Class 6 to 12
   d) Bachelor's degree
   e) Master's degree
   f) Doctor's degree

7) Occupation(s):

   a) Current occupation/ Duration of involvement: _____ / _____

   b) Alternative source of income/ Duration of involvement: _____ / _____

c) Past occupation/ Duration of involvement: _____ / _____

8) Assets:

a) Boat: _____

b) Net: _____

c) Shelter: _____

d) Vehicle: _____

e) Other: _____

9) Income and Debt:

a) Amount of income: _____

b) Amount of debt: _____

10) Family:

a) The number of people living in your household: _____

b) Family members who are involved in fisheries activities: _____

Question Set 2: Values and Beliefs

Pleae choose which values are 'not important', 'somewhat important', and 'very important' in terms of their contributions to the SSF and DF production of Sagar Island:

	Types of values	Descriptive statements	Not important	Somewhat important	Very important
1	Ecosystem conservation	Healthy marine ecological system			
2	Peacefulness	Fishing villages without conflicts			
3	Equality	Equal fishing opportunity among fellow fishers			
4	Freedom	Freedom to decide when and where to fish			
5	Ecological knowledge	Comprehensive knowledge on marine ecosystem			
6	Wealth	High economic income from fishing work			
7	Spiritual wellbeing	Religious practices and sacred rituals through contact with nature and fishing work			
8	Secure livelihoods	Secure livelihoods from fishing work			
9	Hedonism	Enjoyment and pleasure in fishery			

		life			
10	Self-esteem	Sense of pride for working in the fishing industry			
11	Novelty	Creativity in fishing work			
12	Benevolence	Concern for the welfare of other fishing workers			
13	Moderation	Moderate catch target			
14	Honesty	Integrity in fisheries governing system			
15	Attachment to place	Bond with the marine ecosystem and the community			
16	Social cohesion	Cohesion among the members of the fishing community			
17	Influence	Strong leadership in fishery management			
18	Social recognition	Greater public recognition of fishing work			
19	Tradition	Many young people taking an interest in fishing tradition			
20	Conformity	Acceptance of fishery rules and regulations			

Question Set 2: Social Wellbeing

Think about what being 'successful in life' means to you, personally. Name three components that you think best represent 'success' in life (think of someone that you consider 'successful' and describe what makes you consider the person 'successful').

1) _____

2) _____

3) _____

Appendix D

Ethics Clearance

Initial application # 41043 has ethics clearance

no-reply=kuali.co@mx3.kuali.co on behalf of Kuali Notifications <no-reply@kuali.co>

Thu 6/13/2019 1:39 PM

To: Sevil Berenji <s2berenji@uwaterloo.ca>;

Dear Prateep Nayak and other members of the research team:

Your application has been reviewed by Delegated Reviewers. We are pleased to inform you the **Initial application for 41043 The Role of Values and Beliefs in Dried Fish Production: A Focus on the Well-Being of Producers in the Indian Sundarbans** has been given ethics clearance.

This research must be conducted in accordance with the most recent version of the application in the research ethics system and the most recent versions of all supporting materials.

Ethics clearance for this study is valid until Sunday, June 14th 2020.

The research team is responsible for obtaining any additional institutional approvals that might be required to complete this Expedited study.

University of Waterloo Research Ethics Committees operate in compliance with the institution's guidelines for research with human participants, the Tri-Council Policy Statement for the Ethical Conduct for Research Involving Humans (TCPS, 2nd edition), Internalization Conference on Harmonization: Good Clinical Practice (ICH-GCP), the Ontario Personal Health Information Protection Act (PHIPA), and the applicable laws and regulations of the province of Ontario. Both Committees are registered with the U.S. Department of Health and Human Services under the Federal Wide Assurance, FWA00021410, and IRB registration number IRB00002419 (Human Research Ethics Committee) and IRB00007409 (Clinical Research Ethics Committee).

Renewal: Multi-year research must be renewed at least once every 12 months unless a more frequent review has been specified on the notification of ethics clearance. This is a requirement as outlined in Article 6.14 of the Tri-Council Policy Statement for the Ethical Conduct for Research Involving Humans (TCPS2, 2014). The annual renewal report/application must receive ethics clearance before Friday, May 22nd 2020. Failure to receive ethics clearance for a study renewal will result in suspension of ethics clearance and the researchers must cease conducting the study. Research Finance will be notified ethics clearance is no longer valid.

Amendment: Changes to this study are to be submitted by initiating the amendment procedure in the research ethics system and may only be implemented once the proposed changes have received ethics clearance.

Adverse event: Events that adversely affect a study participant must be reported as soon as possible, but no later than 24 hours following the event, by contacting the Director, Research Ethics. Submission of an adverse event form is to follow the next business day.

Deviation: Unanticipated deviations from the approved study protocol or approved documentation or procedures are to be reported within 7 days of the occurrence using a protocol deviation form.

Incidental finding: Anticipated or unanticipated incidental findings are to be reported as soon as possible by contacting the Director, Research Ethics. Submission of the incidental findings form is to follow within 3 days of learning of the finding. Participants may not be contacted regarding incidental findings until after clearance has been received from a Research Ethics Committee to contact participants to disclose these findings.

Study closure: Report the end of this study by submitting a study closure report through the research ethics system.

Coordinated Reviews: If your application was reviewed in conjunction with Wilfrid Laurier University, Conestoga College, Western University or the Tri-Hospital Research Ethics Board, note the following: 1) Amendments must receive prior ethics clearance through both REBs before the changes are put in place, 2) PI must submit the required annual renewal report to both REBs and failure to complete the necessary annual reporting requirements may result in Research Finance being notified at both institutions, 3) In the event that there is an unanticipated event involving a participant that adversely affects them, the PI must report this to both REBs within 24 hours of the event taking place and any unanticipated or unintentional changes which may impact the research protocol shall be reported within seven days of the deviation to both REBs.

Initial application ethics clearance notification: Your clearance notification will be added to the record within 24 hours. Go to "View Admin Attachments" in the research ethics system (right-hand side) to print a copy of the initial application ethics clearance notification.

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Best wishes for success with this study.

If you have any questions concerning this notification, please contact the Research Ethics Office or email researchethics@uwaterloo.ca.

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