VULNERABILITY TO VIABILITY
GLOBAL PARTNERSHIP

A Situational Analysis of Small-Scale Fisheries in Bangladesh: From Vulnerability to Viability

V2V Working Paper No. 2022-1

Sabiha Ahmed Diba, Haseeb Md. Irfanullah, Samiya A. Selim,
Syed Tauheed Raihan

January 2022

Editors:
Ana Carolina Esteves Dias
School of Environment, Enterprise and Development (SEED), Faculty of Environment, University of Waterloo, Waterloo, ON, Canada

Derek Armitage
School of Environment, Resources and Sustainability (SERS), Faculty of Environment, University of Waterloo, Waterloo, ON, Canada

Prateep Kumar Nayak
School of Environment, Enterprise and Development (SEED), Faculty of Environment, University of Waterloo, Waterloo, ON, Canada

Cover design:
Sevil Berenji

Cover photo:
Robert Seidel (Unsplash)

How to cite:
Diba, S. A., Irfanullah H. M., Selim, S. A., Raihan, S. T. (2022). *A Situational Analysis of Small-Scale Fisheries in Bangladesh: From Vulnerability to Viability*. V2V Working Paper 2022-1. V2V Global Partnership, University of Waterloo, Canada.

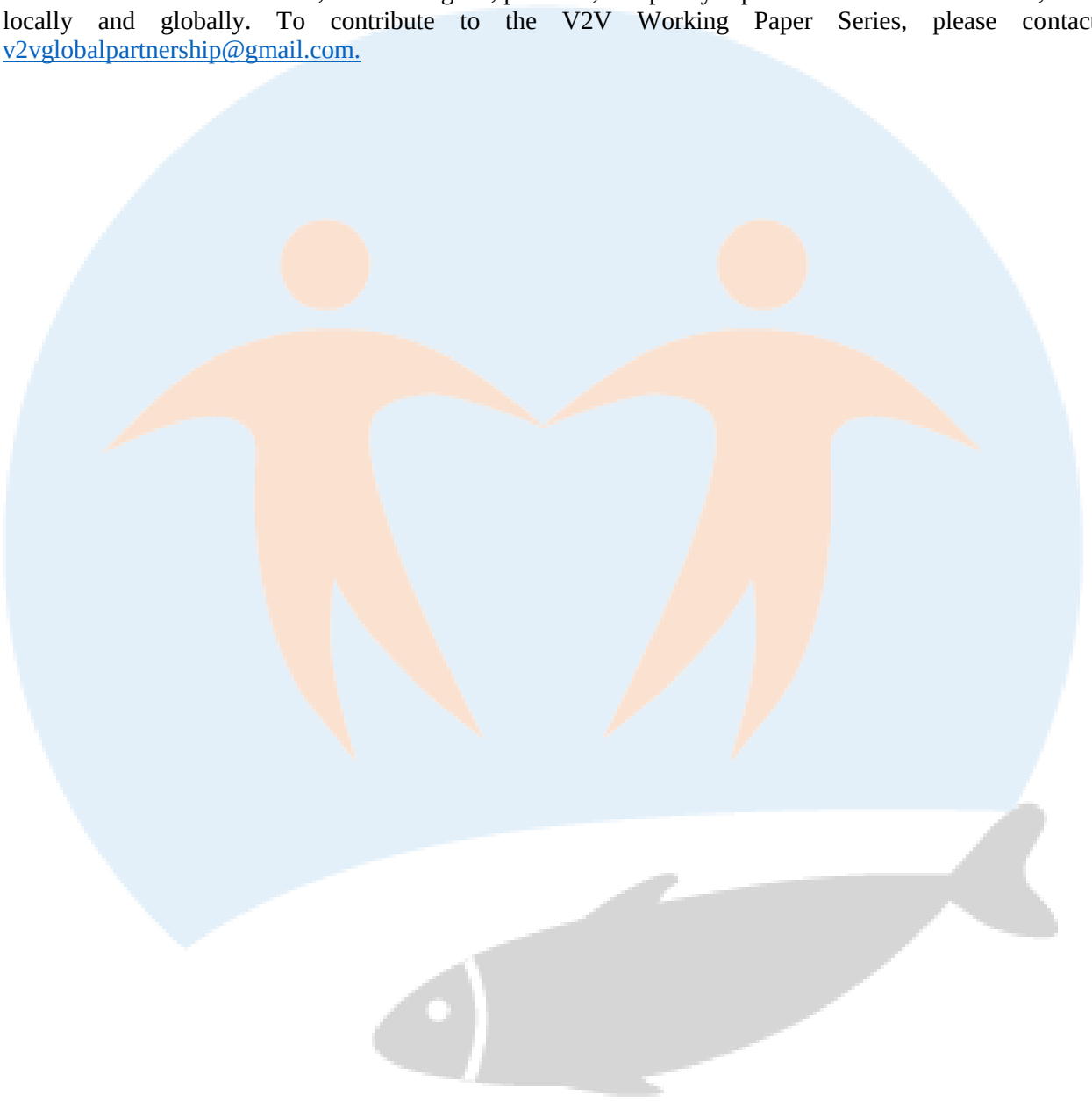
V2V Global Partnership Secretariat
School of Environment, Enterprise and Development,
Faculty of Environment
200 University Avenue West, EV 3
University of Waterloo, Waterloo, ON, N2L 3G1 Canada
Website: www.v2vglobalpartnership.org
Email: v2vglobalpartnership@gmail.com

V2V Global Partnership is supported by the Social Sciences and Humanities Research Council of Canada under its Partnership Grant Program.

Social Sciences and Humanities Research Council of Canada
Conseil de recherches en sciences humaines du Canada
Canada

V2V Working Paper Series

V2V Global Partnership "Working Paper Series" aims to facilitate the exchange of ideas, mobilize knowledge and generate broad-based discussions on vulnerability-viability themes within the context of small-scale fisheries. The Working Paper Series will provide a collaborative and interactive platform for academics, practitioners, representatives of civil society, and individuals interested in making written contributions to the theoretical, methodological, practical, and policy aspects of small-scale fisheries, both locally and globally. To contribute to the V2V Working Paper Series, please contact v2vglobalpartnership@gmail.com.



A V2V Situational Analysis of Small-Scale Fisheries

Small-scale fisheries (SSF) are an important economic resource, both at the local and global level; their depletion has ramifications on fundamental aspects of life, spanning from food security to society's wellbeing and culture. On the global scale, SSF provide food security and a source of livelihoods and income for more than 100 million people. The objective of the V2V Situational Analysis is to build a global perspective on key vulnerabilities and opportunities associated with SSF viability across six countries in Asia (Bangladesh, India, Indonesia, Japan, Malaysia, Thailand) and in six countries in Africa (Ghana, Malawi, Nigeria, Senegal, South Africa, Tanzania). Each country-level situational analysis identifies the key social-ecological drivers of change, emerging issues and challenges confronting SSF, and important policy and governance concerns.

.

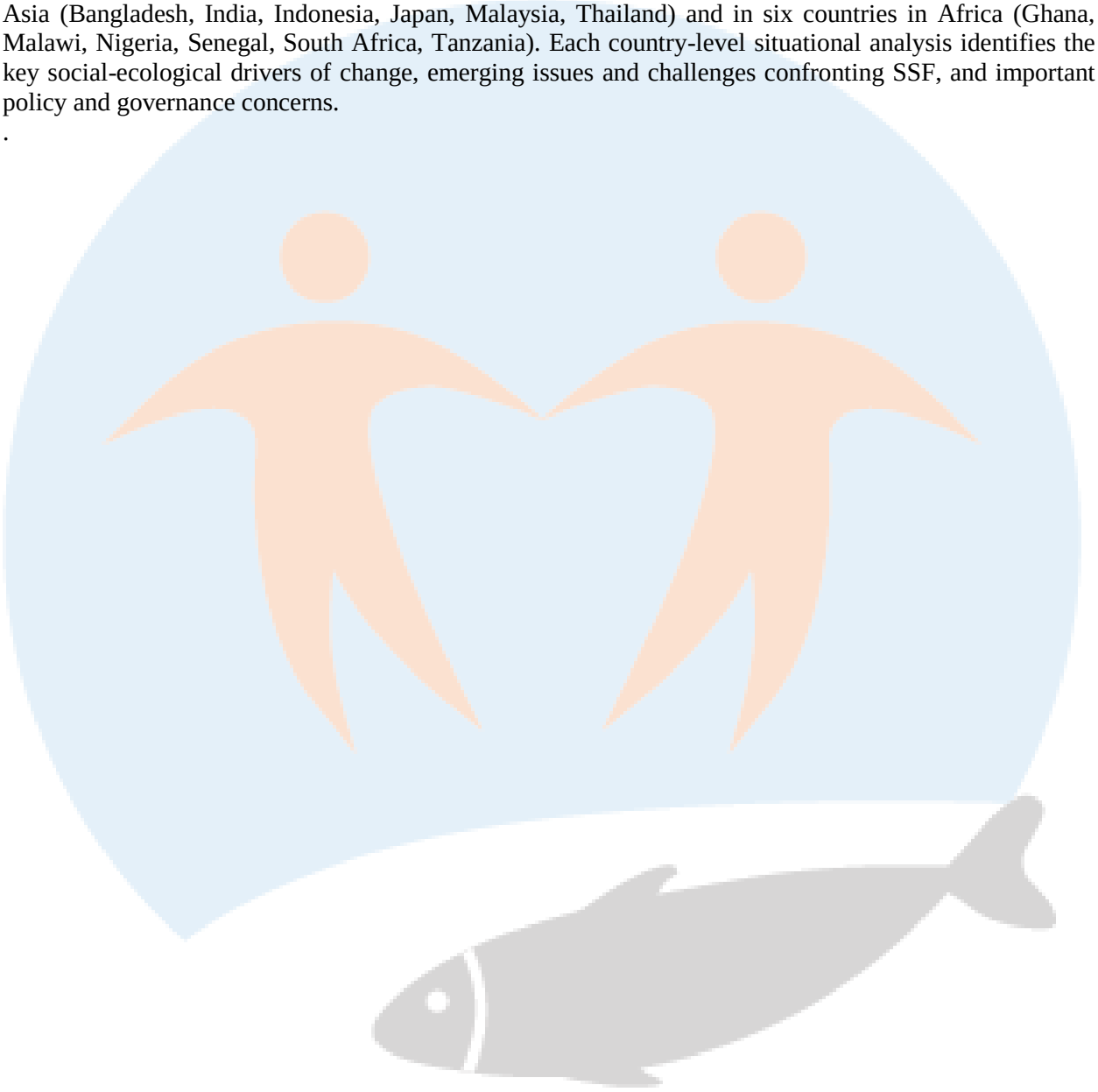
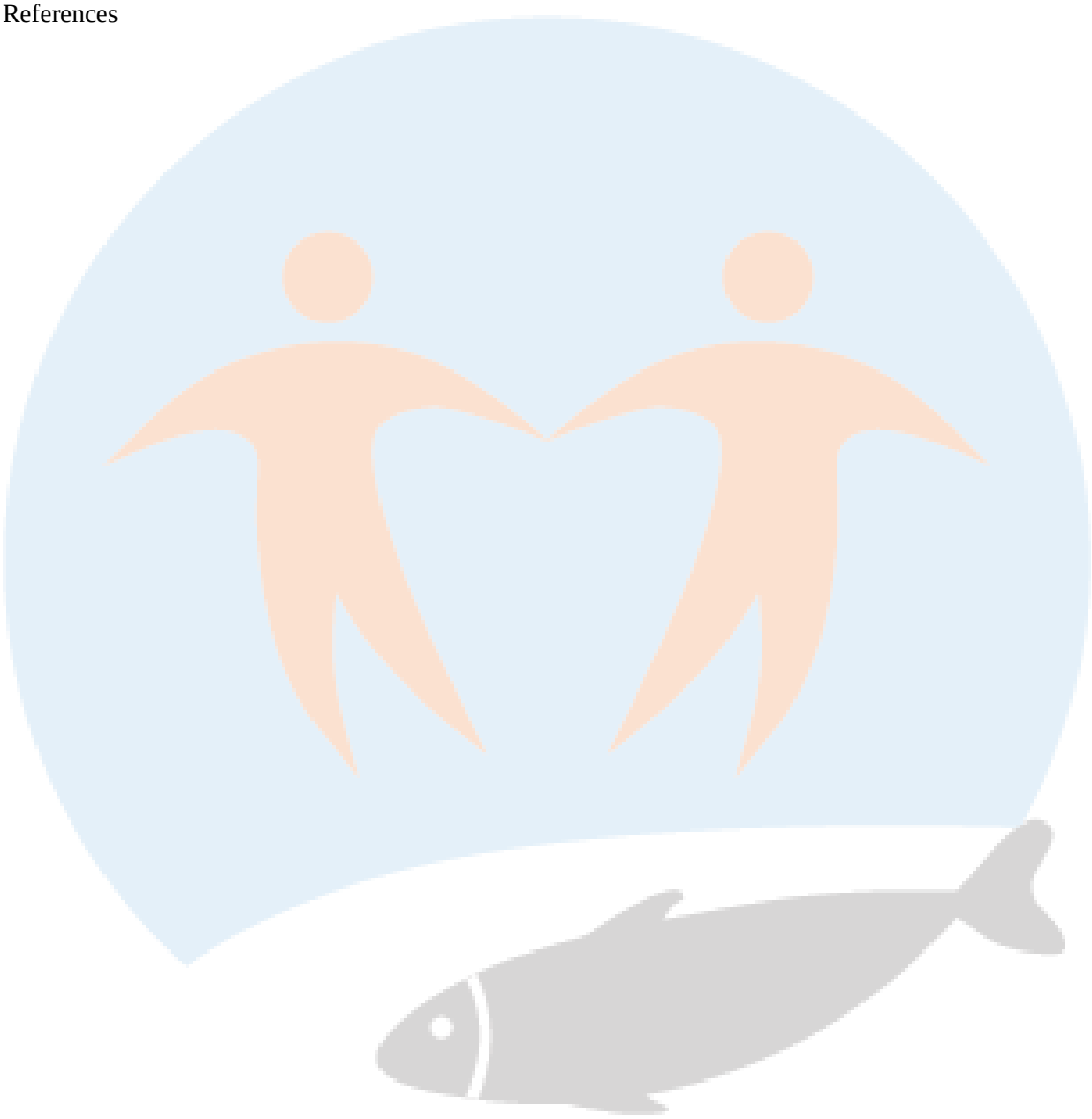


Table of Contents



A Situational Analysis of Small-Scale Fisheries in Bangladesh: From Vulnerability to Viability

Sabiha Ahmed Diba[1] ● Haseeb Md. Irfanullah[1] ● Samiya A Selim[1*] ● Syed Tauheed Raihan[1]

[1] Center for Sustainable Development, University of Liberal Arts Bangladesh, Dhaka, Bangladesh

* Corresponding author: samiya.selim@ulab.edu.bd

1. Introduction

Countries divide their fisheries into several categories, and small-scale fisheries is one among them. However, the terminologies vary, and the classifications include a wider range of categories. The terminologies often include artisanal, traditional, and recreational or subsistence fisheries depending on how the categories have been defined (The WorldFish Center, 2007).

Fish and fisheries have always been an inseparable part of the life and livelihoods of the people of Bangladesh. Fish alone supplies about 60% of animal protein intake by the population of Bangladesh. Fisheries also play a major role in employment, foreign exchange earnings, and other aspects of the economy (Islam, 2011). Bangladesh is one of the world's leading fish-producing countries with a total production of 4.134 million metric tons, where inland aquaculture contributes 56.44%, and inland capture contributes 28.14%, to total production in 2016-17 (Mozumder et al., 2020; Shamsuzzaman et.al, 2020).

1.1 Social-ecological scenario of small-scale fisheries in Bangladesh

An SES is an environmental framework unpredictably connected to and influenced by one or more social frameworks (Anderies et al., 2004; Mozumder et al., 2019). Moreover, SESs are settled, multilevel frameworks that give fundamental services to society, such as the supply of food, fiber, and energy (Binder et al., 2013; Mozumder et al., 2018).

If we take small-scale fisheries (both inland and coastal) as an example here, they are important social-ecological frameworks in many developing countries, giving basic environmental services and livelihood opportunities to communities that are frequently considered among the world's poorest and most helpless (Béné et al., 2010). Different research approaches have been created and connected in different studies, in which the interaction between the social system and the biological system has been explicitly considered (Binder et al., 2013; Mozumder et al., 2018).

1.2 Socio-economic analysis of small-scale fisheries in Bangladesh

In Bangladesh, fish and fisheries play an important role to the economy and food security. The majority of the fishing families belong to socially neglected classes and fishing is traditionally a low-status occupation. As it were about 14% of the full fishing population is literate, and not more than one per cent has secondary or higher education. Daily salary of fishers depends on their fishing instruments use, fishing season, fishing technique taken after, and the fishing efforts made. For vocation, fishers go out fishing early in the morning, and come back home the following day. The contribution of small-scale fisheries in expanding food supply, job creation, raising nutritional status and gaining foreign trade have been created tremendously in the last

few decades. Over exploitation and environmental hazards resulted in declined supply of fish from open water resources, which ultimately has a great negative impact on the livelihood of fishing communities. Most of the fishers do not have enough eco-friendly and selective fishing gears for fishing. Lack of knowledge on modern fishing gears and technologies keep them in the low-income generation process (Giri, 2018).

1.3 Governance in small-scale fisheries in Bangladesh

Good governance is a fundamental precept for sustainable fisheries management (Jentoft et al., 2018; Mozumder et al., 2020). Fisheries governance is the sum of the lawful, social, financial, and political courses of action utilized to manage fisheries (Symes, 2006; Mozumder et al., 2020). It comprises international, national, and nearby dimensions, and can incorporate legitimately authoritative rules as well as standard social arrangements (Mozumder et al., 2020). The previous studies broadly established that the conventional approach cannot address the complex socio-economic characteristics, different livelihood needs, and the multi-species nature of many SSF (Andrew & Evans, 2011; Mozumder et al., 2020).

1.4 Power relation and stakeholder conflicts between different resource users and interest groups

The power relations based on wealth and dependency among actors (most effective to slightest powerful) within the value chain are as follows: Stockiest (In local language - Aratdar) → Boat owner (In local language - Mohajan) → Boatman (In local language - Majhi) → Oarsman (In local language - Malla) /Shareholder (In local language - Vaghi). The aratdar can be considered the most powerful within the chain as the aratdar provides loans to the mohajan. In some cases, conflicts arise between mohajon (boat owner) and fishing group when the latter perceives injustice in profit sharing or wage payment because the former has an association with an effective local political leader, hence trying to deny hired fishers of their compensation". (Mozumder et al, 2020).

1.5 Degradation status of ecosystem, social justice, poverty, displacement/migration and local livelihoods of coastal small-scale fishers in Bangladesh

The livelihoods of poor coastal small-scale fishers in Bangladesh are moreover enmeshed into a series of vulnerabilities. Small-scale fishers in Bangladesh, specially the coastal/marine, are prone to a host of cross-scale stressors or vulnerabilities (Deb & Haque, 2011; Deb & Haque, 2016) including those emanating from climate changes, that affect differently on different groups. Along the Chittagong coast, migrant fishers come basically from nearby Noakhali or the Bhola and Barisal districts during the hilsa fishing season. Most migrant fishers are either regular fishers, or work in agriculture in their place of origin. They relocate to the Chittagong coast during the rainy season when there are no rural activities where they live (Deb & Haque, 2016).

2. Small-scale fisheries contribution to Bangladesh

Bangladesh fisheries have a sufficient range of development to strengthen the national economy and in ensuring food security. Bangladesh is one of the world's leading fish producing countries where in 2016 - 17, inland aquaculture contributes 56.44%, and inland capture contributes 28.14%, to total production. The

marine fisheries production contribution to total fish production was 15.42% with a growth rate of 1.75% for the same year.

Bangladesh has achieved self-sufficiency in fish production. In 1990, per capita consumption of fish was 7 kg per year, and that in recent years it stands at 30kg per year (FRSS, 2017). The output of fishery capture was 11.63 lakh MT. in 2016–17. Marine fisheries production has increased as a result of recently achieving an enormous amount of maritime boundary (increase in water areas). In 2016–17, total marine fisheries production was 6.37 lakh MT, whereas industrial trawl fishing was 1.08 lakh MT and artisanal fisheries were 5.29 lakh MT. In the last 34 years, the total fish production in Bangladesh has increased six-fold, and by 2020–21, fish production is expected to reach 45.52 lakh tons (FRSS, 2017; Shamsuzzaman et al., 2020).

3. Small-scale fisheries profile in Bangladesh

SSF is not formally defined in Bangladesh. Table 1 summarizes the key features of SSF in Bangladesh.

Table 1

Summary of small-scale fisheries profile in Bangladesh

Terms used in SSF	Gear types	Vessel types	Ecosystem types	Ecosystem detailed types
• Artisanal • Coastal • Inland • Inshore • Small boat • Small scale • Subsistence • Traditional	• Cast nets • Gillnets • Hooks and lines • Lift nets • Traps	• Wooden • Moon Boat (traditional fishing boat, and as the name suggests is moon shaped to tackle large waves)	• Marine • Freshwater • Brackish	• Intertidal • Beach • Coastal • Estuary

3. Social-ecological changes and key drivers

Bangladesh is a home for 1.6 million fishers, of which more than 0.5 million operate in the sea. Population of Bangladesh is scattered all over the country and are engaged in fishing occupations through fishing in the aquaculture ponds, inland open waters, coastal and marine water bodies. In the artisanal marine fisheries sector the small-scale fishing fleets consist of about 68,000 non-mechanized traditional and mechanized boats (Giri, 2018).

Coastal assets, including riverine and small-scale marine fisheries in Bangladesh, significantly contribute to the national economy, promoting the financial well-being of devastated coastal fishing communities (Shamsuzzaman et al., 2017; Mozumder et al, 2019). The single most important fishery, the hilsa, constitutes approximately 12% (0.5 million tons) of the total fish production of 4.134 million metric tons as of 2016–2017 (Department of Fisheries, 2019); Mozumder et al., 2019). In the value chain fisheries have a total annual value of USD 2 billion, thus accounting for more than 1% of Bangladesh's GDP and employing approximately 0.5 million fishers and 2.5 million people (Hossain et al., 2019; Mozumder et al., 2019).

3.1 Key drivers and pressures of change related to vulnerabilities and viabilities in small-scale fisheries in Bangladesh

It should be noted that hilsa fish is the primary target species in SSF and is valued greatly due to its cultural and traditional importance (Islam & Chuenpagdee, 2018). Thus, many of the sources for SSF data are based on hilsa fish, which is referred to in this paper interchangeably with generic SSF.

3.1.1 Population growth and increased number of fishers and non-fishers

The total population of Bangladesh was 132 million in the year 2003, and it has been recorded as about 168 million in the year 2019. Many part-time fishers also get involved in fishing to make extra money due to free access to water bodies and the progressively rising price of hilsa. Therefore, the intensity of fishing is increasing as the number of fishing boats is increasing. Even nowadays, fishers come to catch hilsa from different districts or areas. As all of these fishers do not have hilsa fishing as their primary occupation, and so they do not care about ban periods or restrictions on catching juveniles and brood stock (Mozumder et al., 2019).

3.1.2 Juveniles and broodstock harvestings

To allow for continuous production, around the full moon in October, the Bengali month of Ashwin, any catch of brood hilsa is banned in all the primary breeding grounds for 22 days. However, fishers tend to violate the rules as the fish are available in abundance during breeding seasons. As the brood hilsa has high market demand locally and internationally, the highest numbers of brood and ripe hilsa are caught every year, during the breeding season (Mozumder et al., 2019).

3.1.3 Climate change

Climate change can have multiple impacts on fishing communities, their households and livelihoods, which lie outside the realm of present-day experience, and which might limit the effectiveness of past adaptive strategies (FAO, 2012). The SSF sector of Bangladesh is suffering due to a lack of technical support and ignorance. The small-scale fishers are unable to claim their rights over the resources as they are ignorant about their role in conserving the resources. The Bay of Bengal is one of the most disaster-prone regions in the world. Cyclones and tropical storms are the yearly events, the region faces. Additionally, tidal activity becomes more turbulent, making fishing operations dangerous and limited. (Giri, 2018)

3.1.4 Changes of migratory routes

An academic and hilsa researcher opined that the migratory routes and spawning grounds of hilsa were disturbed, displaced or even destroyed because of various climate change effects, anthropogenic activities, increased siltation and the rising of the river basins. Including the Meghna River, sedimentation has been increased, and many sandbars have been formed in the riverbeds of Bangladesh. As a result, these sandbars reduced the nursery areas for the fish fry and caused blockage in the migratory route of hilsa. (Mozumder et al., 2019).

3.1.5 Improved fishing technology

Modern and improved fishing technology is one of the reasons for hilsa depletions. Earlier, the fishers used normal cotton nets to catch hilsa, and the mesh size was big. Consequently, juvenile hilsa seem effortlessly pass through the net. In the early 1990s. the use of a modern net (generally a fishing gillnet made of monofilament synthetic nylon fiber) with a small mesh size began. After that, the fishers become able to catch more hilsa in a short time. Even nowadays, some fishers are using motorized boats instead of rowboats, as they get a loan from the moneylenders to build such boats. Sometimes, they use more powerful engines in their boats than the law enforcement authorities have, so they can easily get away with any illegal gear or (juveniles and brood stock) catch they usually happen to have (Mozumder et al., 2019).

3.1.6 Smuggling of hilsa

Often, greed for a higher price, large, high-quality hilsa are often smuggled to India, pushing the price up in the local market. By selling hilsa on the Indian market, smugglers can also turn a considerable profit (Mozumder et al., 2019)

3.1.7 Imposed ban period

To increase the size and sustainability of the hilsa catch, the government of Bangladesh has imposed fishing ban periods in six hilsa sanctuary areas. These ban periods have had a significant impact on the livelihoods of hilsa fishers, causing desperation which in turn has put immense pressures on hilsa stocks. In fishers' life, the ban period, popularly known as the 'obhijan' (expedition), is one of the biggest stress and it has placed them under severe financial constraint. To overcome the situation, the fishers generally sell off their family properties, participate in seasonal migrations, reduce their daily food intake, induce other family members to get jobs, even take out loans from money lenders and NGOs at a very high interest rates, and, finally, even though they realize that the ban period is good for them in the long run, they need to get involved in illegal fishing, including for juveniles and brood stock during the ban period (Mozumder et al., 2019).

3.1.8 Inadequate allocation of incentives by the government

The government of Bangladesh introduced an incentive program of 40 kg of rice per month per hilsa fishing family during the ban period. However, fishers complained about the distribution of incentives. They said that the incentives rarely come in time to feed their families during the fishing ban period. Some fishing households have seven-to-eight members or more. 40 kg of rice is not enough for those households for one month. Sometimes, they get only 30–35 kg of rice instead of 40 kg. Similarly, in the beneficiary lists, generally not all fishers are included. Fishers claimed that some deserving fishers are excluded from these lists, and some non-fishers are given benefits intended as incentives not to fish during the ban periods through favoritism due to mismanagement and official corruption among local government administration, the chairman of the Union Parishad (smallest administrative unit), and other relevant officials who prepare the beneficiary lists. Such competition has sometimes caused a spike in tension, for inclusion in the government compensation scheme, together with irregularities in its distribution (Mozumder et al., 2019).

3.2 The impacts of drivers on vulnerabilities and viabilities of small-scale fisheries in Bangladesh

The impacts of driving forces, pressures of these changes on the natural, human, social, government and governing systems related to vulnerabilities and viabilities in small-scale fisheries. Some of these have been described below-

3.2.1 Poverty

Poverty is one of the key impacts of the driving forces in SSF. The SSF community is already vulnerable due to different environmental and social-ecological factor, besides poverty makes them more vulnerable. Among SSF community, those who are full-time hilsa fishers remain in obligation during hilsa fishing ban period which bring economic hardship to them. They do not have other alternative occupations. The compensation (not to fish during the ban) that they receive from the government is of insufficient quantity to support of other essential costs for the family such as children's education (Mozumder et al., 2019).

3.2.2 Malnutrition

Most fishers are concerned about year-round food insecurity. Particularly during the banned fishing period in the sanctuary, they suffer for food insecurity Every year, the hilsa fishers go through food insecurity for four-to-five months, and the reason for this food insecurity is an off-season of fish catches. The complete bans for two months in five sanctuaries have created negative impacts on the dependent livelihoods. The condition becomes more pitiable during the non-fishing season and banning season. The fishers cannot cover the expense of even their basic food. Only a few fishers had food security for the whole year because of having agricultural land. Earlier hilsa was widely available to consumers in all income groups. Still, its price has increased several-fold due to a decline in the wild catch and making it impossible for poorer consumers like the fishers to afford it. They cannot afford and eat hilsa to fulfil their nutritional requirements. During this time, children and pregnant women suffer most from lack of nutrition (Mozumder et al., 2019).

3.2.3 Conflicts

In SSF, thousands of people are involved in hilsa fishing as well as different forward and backward linkage activities in the fish chain (fishers, aratdar/ mahajan/ dadondars-money lenders, local government administrators, NGOs, departments of fisheries, and law enforcing agencies including police and coastguard). Sanctuaries generally increase conflicts among them due to competition for inclusion in incentive schemes and competition for fishing space that negatively impacted their income (Mozumder et al., 2019).

3.2.4 Debt trap

Fishers' access to the formal credit markets (i.e., banks) is very limited due to lack of, or insufficient collateral assets, like landed property. That is the reason why they are dependent on informal credit mechanisms, like the dadon system. Dadon is a transaction built upon a verbal contract between the fisher and the money lender (called dadondar) where the fisher has to sell the fish to the lender, or the lender gets a certain commission when fish is sold to a third person. Thus, the dadon system traps the fishers to the money lender in a debt cycle. (Giri, 2018).

3.2.5 Illegal fishing

Vulnerable socio-economic condition forces the small-scale fishers for illegal fishing. The fishers are controlled by the money lender. They are out of the good governance practice within the society they live. They are unable to recognize law power which influencing them to comply the rules and regulations (Giri, 2018). Fishers are accused to pay fines for illegal fishing activities. The fishing permits may be cancelled and to pursue legal procedures, the fishers have to take frequent trips to the district headquarters, which have been involved with money and time, and also increase exposure to official harassment (Islam, 2012).

3.2.6 Destitution of fishing security

Pirate attacks are a very common problem for the small-scale fisheries, especially for the hilsa fishers. Fishers are in fear of increasing pirate attacks during the peak season. Pirates usually try to take fishers' boats and fishing nets. Also, they demanded ransom from their family to let the fisher go. Later, the fisher's family took a loan from the dadondars and ransomed them from the pirates (Mozumder et al., 2019).

3.2.7 Reduced social bonding and heightened social tensions

There is strong competition for fishing space in the sanctuaries that often leads to conflicts when fishers try to spread nets close to one another. In turn, such a circumstance, leads to a loss of property or indeed physical harm, frequently spilling over into other communities, encourage increasing social tensions on land. (Mozumder et al., 2019).

3.3 Factors contributing to small-scale fisheries vulnerability in Bangladesh

The following factors that have been found from the earlier studies (Islam, 2011) as contributing to SSF vulnerability in Bangladesh:

- Dependency on single species (e.g., hilsa, shrimp or prawn larvae)
- Seasonality and fluctuation of natural resources
- Extreme weather conditions (e.g., cyclones, and coastal storms)
- Piracy and other unlawful activities
- Landlessness and settlement in areas exposed to coastal disasters
- Lack of access in political processes and local institutions
- Fishers' limited capacity to bargain
- Lack of access to the formal credit system

Most of the fishers do not have sufficient eco-friendly and selective fishing gears for fishing. Lack of knowledge on modern fishing gears and technologies keep them in low-income generation process. They are deprived and dominated by the money lenders (Giri, 2018). The participation of multiple stakeholders who are involved in the small-scale fisheries is vital in implementing, monitoring, and enforcing regulations which can lead to compliance through collective action. Additionally, the lack of participation of the local communities, proper policy implementation, and institutional collaborations have led to ineffective small-scale fisheries management in Bangladesh. The timely implementation of the policy, close co-operation and mutual support among government institutions that have a similar scope, and the local communities is therefore essential for the sustainability of the small scale fisheries (Mozumder et al., 2019).

4. Emerging issues and challenges

4.1 The key emerging issues surrounding small-scale fisheries in Bangladesh

One of the key emerging issues not only for SSF but also for every aspect of the whole world is COVID-19 pandemic. COVID-19 affects the SSF communities in several ways. Sunny et al. (2021) in their study found that, due to COVID-19 pandemic, fishers, fish laborers and other actors of fisheries value chain of Bangladesh experienced numerous issues. During the emergency, their life and life of the individuals associated with them became more difficult than before. Fishers' major issues to lockdown periods were ban period, low fishing rate, low income, lack of alternative income generating activities, low consumer demand, weak value chain, continuous increase in lockdown days, and limitation of dadon (lease cash) (Mohammad et al., 2016).

A study by Sunny et al. (2021) found that fishers completely depend on fishing which made them more vulnerable to COVID-19 pandemic. A large portion of the fishing labor engaged in fish processing, harvesting and marketing became unemployed during lockdown period. Unemployment situation intensified conflicts between different stakeholders which created social uncertainty. In another study in 2019, showed that most of the fishers were forced to borrow with high interest from the local money lender as they were unable to sell their fishes. They did not have enough resources to mortgage; therefore, they were also unable to take loan from the concerned bank (Sunny et al., 2019). It was reported by the local respondents in the study conducted by Sunny et al. (2021) that government subsidies were inadequate to support their families, promoting them to fish illegally and breach COVID-19 precautions. In a word, In-term of human, physical, social and financial capital, the fishers and other marginal groups of small-scale fisheries were facing a four-pronged crisis. The major vulnerabilities had been discussed in the particular study as in the three specific parts:

- *Shocks*: Illness and unemployment of the fishers were the main shocks. Their income stopped as they all had to stay at home. The poor fishers were at great risk which forced them to reduce their resources.

- *Trends*: In COVID-19, numerous trends damaged the livelihoods of the small-scale fisheries community. While COVID-19 induced difficulty of fish supply and shortage of fishing gear in the market, low consumer demand, creditors' pressure and rising price of commodities made the situation worse, their larger family size, political crisis and environmental changes made them more vulnerable.

- *Seasonality*: During March-April, seasonal hilsa conservation ban period affect the fishing communities in the major rivers of Bangladesh. Restriction was imposed in all sanctuary areas during this time. Due to the lack of alternative sources of income, the people had nothing to do against the seasonal ban period which made them more vulnerable in COVID-19 crisis. The government provided support to the fishers to keep their lives normal which was far less than what was needed as many real fishers didn't get this support due to nepotism (Islam et al., 2017; Sunny et al., 2019).

4.2 The key emerging challenges in small-scale fisheries in Bangladesh

The fisheries industry is challenged with a range of economic, institutional and environmental concerns in Bangladesh. 54 floodplain fish species are in danger of extinction according to an IUCN (International Union for Conservation of Nature) study. In the floodplains, the pressure of fishing is so heavy that less than 2% of produced fish can survive at the end of each year. Recurrent floods and natural disasters are thought to be main underlying causes behind this fall. Climate change has severe impacts on fishery-based livelihoods and on domestic food supply. Due to climate change, vulnerability of fishery-based livelihoods

may significantly increase in the upcoming decades, and increased frequency and intensity of cyclones and floods would result in greater damage to fishing materials and loss of fish due to lack of adaptation (Ghose, 2014).

Marine capture in Bangladesh, represents about 20% of total fish production. The floodplain and marine fisheries are under serious threat due to overfishing. Over misuse in the coastal region poses significant challenges on marine living resources and increases the dependency on distant water fishing in the long run. For deficit of the fisheries sector and environmental degradation, inadequate economic capacities, poor resources management and lack of research facilities are also responsible (Alam & Thomson, 2001; Ghose, 2014). Poor management of prawn and shrimp culture is having devastating effects on the Sundarbans (the largest mangrove forest in the world) that are showed by the researchers (Hoq, 2007; Ghose, 2014).

Blue Economy development in coastal Bangladesh is also one of the key emerging challenges for small scale fisheries. Blue economy (BE) should not just be about exploitation, it is also conversation what Bangladesh - living based such as biodiversity, fisheries and non-living based such as industry. Before can start to expedite any sector, e.g., marine and fisheries resource, need to explore the fisheries we have. Study by Mahmud et al (2019) revealed a number of barriers to the implementation of fisheries laws. The study identified coastal poverty, the inadequate and improper distribution of incentives, insufficient logistic support, limited alternative occupations, political interference and a lack of awareness regarding fishery regulations as the major limitations in the implementation. This should be considered when looking to exploit and expand fisheries sector further. Lack of implementation of sustainable yield, Marine Protected Areas (MPAs) and seasonal closures.

The drawbacks of proper implementation and the noncompliance of fishery regulations lead to fishery degradation, directly affect the sustainability of the coastal and marine ecosystem of Bangladesh and may have barriers to achieving Goal 14 of the Sustainable Development Goals (SDGs).

4.3 The key emerging opportunities surrounding small-scale fisheries in Bangladesh

Most fishers in rural Bangladesh work on a small-scale basis. Poor fishers endure disadvantaged situations due to policies that favor powerful players in the sector (Sultana & Thompson, 2007; Ghose, 2014). The CBFM initiative has created a series of fisheries management approaches for ensuring equitable access to fisheries resources for community-based organisations (CBOs). Established in 1994, the venture bolstered by Division for International Development (DfID) and executed by Bangladesh's Division of Fisheries (DoF) in organization with the WorldFish Center and to promote equitable access and sustainable management of inland fisheries resources, 11 NGOs adopted a research-based approach and to be run by the CBOs (The WorldFish center, 2010; Ghose, 2014). In over 80 water bodies, a total of 164 fish sanctuaries have been established so far under the CBFM approach. The project included 14,000 CBO group of individuals and encourage 9,000 direct beneficiaries (Ghose, 2014).

This section gives an overview of the fisheries sector and its challenges and opportunities in Bangladesh. From a national macroeconomic and food and nutrition security perspective, it is evident that the performance of fisheries sector is crucial. By enhancing investment and research infrastructure, more-strict environmental policies, and introducing better storage and marketing facilities, policy makers must spare no effort to ensure the functioning of this sector in full swing. More importantly, to assess their vulnerability and strategies to tackle them, the situation of fishers must be taken into consideration and special task force should be built (Ghose, 2014).

5. Policy and governance

The government of Bangladesh makes laws, rules, policies, guidelines, ordinances and circulars time to time and regulates the capture water fisheries and it has been implemented based on the allocation of fishing right through periodic leasing. The inland capture fisheries such as streams and beels (a phrase used to describe a pond (wetland) with still water) are leased out on the premise of three years and in case of group fisheries, for 6 years and in a few circumstances, up to 9 years. (Ministry of Land memorandum, 1991; Rahman et al., 2018). Table 2 specifies key regulations in fisheries.

Table 2

Implications of fisheries with different acts, ordinances and rules

Major acts, ordinances, rules related to coastal and marine fisheries	Main Objectives/Features
● Protection and Conservation of Fish Act, 1950 ● Protection and Conservation of Fish Rules, 1985	● Protect and conserve fish in Bangladesh ● Prohibit harmful and unlawful fishing activities (such as the installation of fixed nets, cages and traps) ● Ban the collection of fish post larvae and shrimp post larvae from coastal waters ● Declare temporal and spatial fishing bans in different rivers and estuaries ● Prohibit the disturbance, alteration or destruction of natural habitats of fish in marine reserves ● Empower fishery officials to implement the rules
● Marine Fisheries Ordinance, 1983 ● Marine Fisheries Rules, 1983	● Manage, conserve and develop marine fisheries in the Bangladesh fishery waters ● Provide licensing for all fishing vessels ● Provide different input and output control measures for fishery exploitation ● Provide compulsory employment of local personnel ● Declare one marine reserve in offshore water (The dumping of a catch in the sea is prohibited except the release of the marine turtle) ● Enforce the mandatory use of the Turtle Extruder Device (TED) in each shrimp trawler
● Territorial Waters and Maritime Zones Act, 1974 ● Territorial Waters and Maritime Zones Rules, 1977	● Declare the territorial waters, continental shelf and maritime zones of Bangladesh ● Regulate the conduct of foreign ships in territorial waters and the activities in the Exclusive Economic Zone (EEZ) and on the continental shelf ● Apply custom and fiscal laws to the EEZ ● Allow the government to construct the installation of scientific research, marine conservation, pollution control and production of energy from the tides, wind, current and sun ● Prohibit the use of dynamite or poison in the EEZ ● Provide rule for the declaration of a closed season in the EEZ
● Environment Protection Act, 1995 ● Environment Conservation Rules, 1997	● Conserve the environment, improve environmental standards and control and mitigate environmental pollution ● Declare important areas of wetlands, mangroves and biodiversity as Ecologically Critical Areas (ECAs

Note. Adapted from the Gazettes of the Bangladesh Government; Islam et al. (2017).

5.1 Policy, plans, compliances, and projects in small-scale fishery governance

Since the 1950s, the Government of Bangladesh (GoB) has passed a few acts, laws, and rules to provide a framework for exploiting, developing, overseeing, and preserving its fisheries division and aquatic resources (Table 3). GoB also introduced a few projects with different organizations as a partnership for the sustainability of the small-scale fisheries (Table 3) (Mozumder et al., 2020).

Table 3

Evolution of small scale fisheries governance

Policy, Plans, Compliances, and Projects	Issues Related to Small Scale Fishery Governance	Year
The Protection and Conservation of Fish Act (PCFA)	● Fishing nets with a mesh size of less than 4.5 cm are prohibited. ● The manufacturing, import, marketing, storing, transportation, and owning and use of monofilament gill nets (Current Jal) are prohibited.	1950
The Marine Fisheries Ordinance and rules	● Two fishing zones for artisanal and industrial fishing, within and beyond a 40 m depth, are stipulated ● Fishing with gear that does not meet specified mesh size, and with any kind of explosives, poisons, or other harmful substances, is prohibited	1983
The New Fisheries Management Policy	● Addresses the over-exploitation of fishery resources and inequality of fishing rights. ● Sets objectives for bringing the most significant benefits of all national fisheries to fishers instead of non-fisher elites ● Adopts conservation measures to ensure that resources are sustained	1986
The National Fisheries Policy	● Goal of enhancing fisheries' resources and production ● Combating malnutrition by meeting the need for animal protein with fish ● Goal of alleviating poverty through creating self-employment and enhancing the socio-economic conditions of fishers ● Goal of achieving economic growth and earning foreign currency by exporting fish and fisheries products	1998
The Hilsa Fisheries Management Action Plan (HFMAP)	● Enforcing compliance with conservation rules and regulations, and strategies related to the hilsa fishery ● Supports a sustainable hilsa fishery, protecting critical habitats, and building the capacity of fisheries' actors ● Offers alternative livelihoods for jatka fishers based on a compensation scheme ● Raises mass awareness of the need for jatka and hilsa conservation	2003
Formation of hilsa sanctuaries	● The government declares four areas in the Meghna, Tetulia, and Andharmanik Rivers and some estuarine waters as hilsa sanctuaries. ● Altogether six hilsa sanctuaries are established by the government, following the HFMAP.	2005
The National Fisheries Strategy	● Promotes and supports collaboration, linkages, and partnerships for the benefit of marine fisheries ● Promotes the participation of fishers, and other stakeholders in the fisheries' value chain, local communities, the private sector, and NGOs (non-governmental organizations) in government programs through the DoF.	2006
Jatka conservation	● Provides food compensation to hilsa fisher households ● Builds awareness of conservation, supporting alternative income-generating activities (AIGAs)	2008

	• Imposing regulations to prevent jatka and brood hilsa fishing during the ban periods	
Formation of the 5th hilsa sanctuary	• A 20 km stretch of the Padma River's lower basin from Narhira to Bhedarganj, Shariatpur District	2011
Formation of the 6th hilsa sanctuary	• At the confluence of the Meghna, Arial Kha, Kala Bador,and Kirton Khola Rivers	2018
International Institute for environment and development (IIED) initiatives	• Innovative ways to tackle overfishing problems and allow threatened hilsa fish stocks in Bangladesh to recover were devised by IIED and partners (Bangladesh Centre for Advanced Studies and Bangladesh Agricultural University) and collaborated with the Department of Fisheries of the government of Bangladesh).	2013-2016
Enhanced Coastal Fisheries in Bangladesh (ECOFISH-BD) project	• Fortifies science-based decision-making in the hilsa fishery and its aquatic ecosystem • Steers adaptive co-management in the sanctuaries • Enhances the socio-ecological and economic resilience of fishing households and communities through improving policy, power, and incentives	2014-2019
Department of Fisheries (DoF)/World Bank project of USD 281.6 million	• More effective management of coastal fisheries, also with responsibilities shared between the DOF and artisanal fishing communities • improvement of sector transparency, integrity, and accountability • gender-balanced institutional development.	2019-2023 (Active project)
Note. Adapted from Mozumder et al. (2020).		

5.2 Legal, policy and institutional frameworks to climate change responses of small-scale fishers in Bangladesh

The small-scale fishers are one of the most vulnerable groups exposed to disaster risks and climate change impacts. Thus, the SSF Guidelines (which was endorsed by the Food and Agricultural Organizations of the United Nations) (Kurien, 2015; Islam et al., 2020) are an appropriate and timely instrument for initiating policy change to make small-scale fisheries more resilient (Seggel & Young, 2016; Islam et al., 2020). Table 4 summarizes the legal and policy frameworks to climate change responses of SSF in Bangladesh.

Table 4

Legal and policy frameworks to climate change responses of SSF in Bangladesh

Legal and Policy Framework	Provisions/Aims and Possible Linkages with Climate Change Responses of Small-Scale Fishers
National Adaptation Programme of Action 2009	• The Ministry of Environment and Forests has included six sectoral working groups for updating Bangladesh NAPA. The Six Sectoral Working Groups (SWG) are: • a) Agriculture, Fisheries and Livestock coordination Bangladesh Agricultural Research Council (BARC), • b) Forestry, Biodiversity and Land-use coordinated by IUCN, Bangladesh, • c) Water, Coastal Zone, Natural Disaster and Health coordinated by Water Resources Planning organization (WARPO), • d) Livelihood, Gender, Local Governance and Food Security coordinated by Bangladesh Institute for Development Studies (BIDS), • e) Industry and Infrastructure coordinated by Department of Environment (DoE), and • f) Policies and Institutes coordinated by Bangladesh Centre for Advanced Studies (BCAS).
Disaster Management Act 2012	• Provide necessary aid for affected vulnerable communities, especially for ultra-poor people (the many small-scale fishers are among the ultra-poor and vulnerable).

Standing Orders on Disaster (SOD)	● The Department of Fisheries is responsible for providing immediate support, relief, rehabilitation, reconstruction, and recovery to affected small-scale coastal fishers. ● To ensure social justice for fishers in relief activities (both governmental and non-governmental) at the local level.
National Disaster Management Policy (NDMP) 2015	● Disaster risk management from an ecosystem-based approach. ● Assessment and management of disaster risk in the fisheries sector through community participation.
Note. Adapted from Islam et al. (2017) and Islam et al. (2020).	

5.3 Broader policies or projects that affect the vulnerability to viability of small-scale fisheries

Islam et al. (2020), in their recent study have shown that the government of Bangladesh has developed an initiative for carrying out extensive development activities on Moheshkhali Island to make it an energy hub of Bangladesh. Besides establishing a profound seaport, several other development projects, such as LNG pipelines, fuel terminals, and drifting oil storage units, will be set up on the island. Including the large-scale transportation of commercial coal-laden vessels and full navigation along the sea-route, there will be fifteen coal control plants on the islands. These may include to the impact on coastal and marine resources exerted by pollution (air and noise pollution) and strong waste produced from the coal-based control plant. The broad development activities and related pollution are likely to be hindering to local mangroves, fisheries, and wildlife. While the respondents of the particular study, were still not fully aware of the potential impacts, one key informant, an NGO official's statement had been noted by the study that the development activities will limit fishers' access to coastal space and fishing areas or even uproot them.

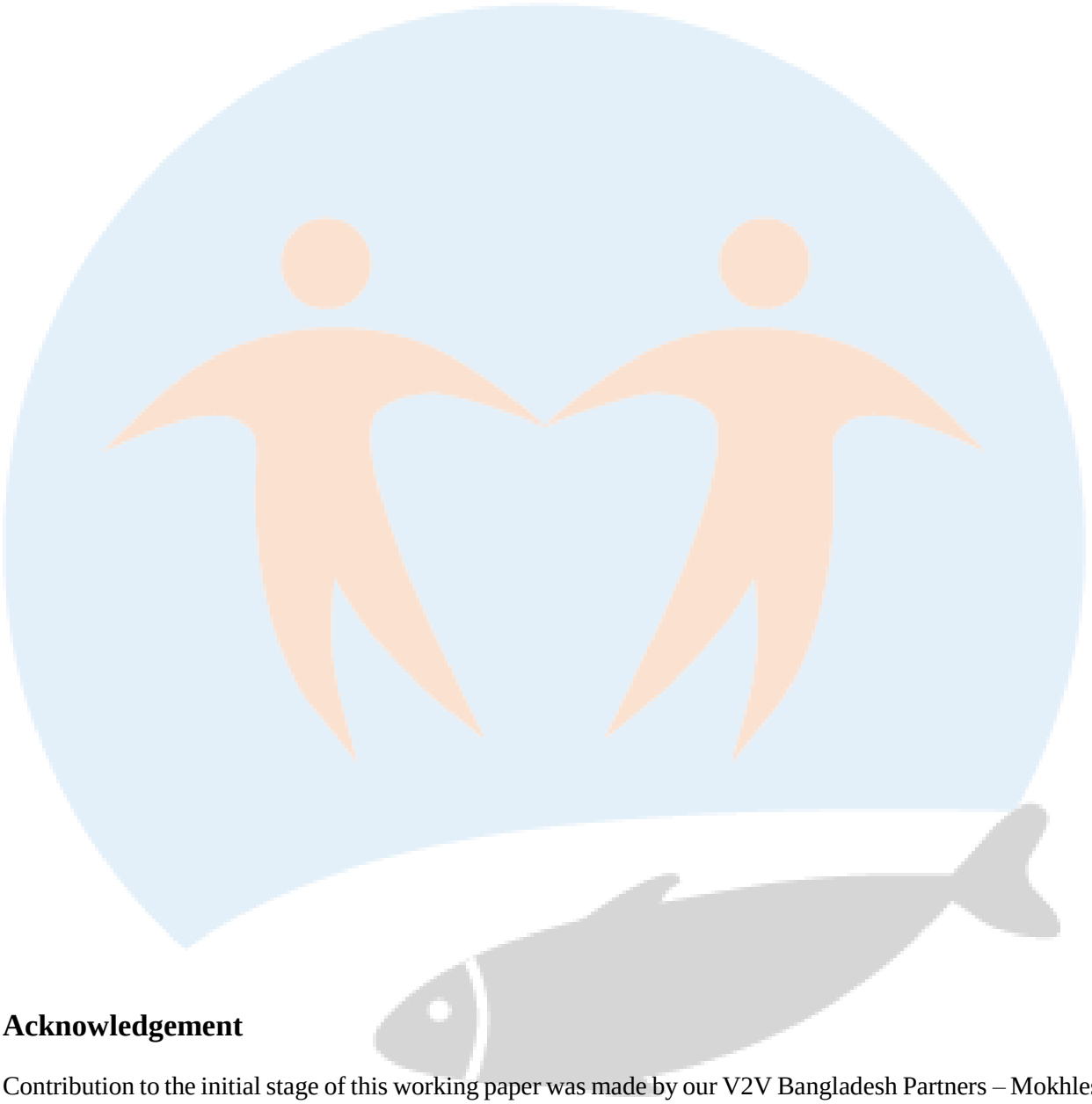
5.4 Execution status of existing policies

In Bangladesh, twelve fisheries laws have been identified towards execution for the regulation and management of the fisheries resources, wherein a few have been executed for regulating and managing of fisheries as well as protecting fish species. There are a few impediments for the proper execution of laws such as, lack of clear policy guidelines and strategy; insufficiency of existing regulatory framework; non-enforcement of legislation and jurisdictional clashes; the absence of standard law review and updating mechanism and formulation of by-laws, rules, orders and so on (Shamsuzzaman et al., 2016; Rahman et al., 2018). Shamsuzzaman et al. (2016) in their review paper, highlighted some major gaps in the existing fisheries related policies and documents, namely:

- Lack of Stakeholder influences on policy formulation
- Insufficient Local Initiative to Broaden Marine Policy
- Lack of Marine Fisheries Policy Related Review and Update
- Lack of Long-Term Policy Perspective
- Lack of Marine Environmental based Policy Process
- Lack of monitoring and Impact Assessment on Policy Implementation
- Inadequate Environmental Conservation
- Insufficient Biodiversity Conservation; etc.

For proper management and utilization of its resources within the purposes of the sustainable development of the country and welfare of its peoples, the Bangladesh Government must enact a comprehensive legal framework following the fisheries policy. Concerned government institutions, development partners,

professionals, researchers and non-government organizations can play important roles towards the development of the fisheries sector in commensurate with the national and international demands (Rahman et al., 2018).



Acknowledgement

Contribution to the initial stage of this working paper was made by our V2V Bangladesh Partners – Mokhles Rahman, Center for Natural Resource Studies (CNRS), Rashed Ahmed, S.M. Munjurul Hannan Khan- Nature Conservation Management (NACOM), Md Shamsuddoha- Center for Participatory Research and Development (CPRD), and Mahmudul Islam- Sylhet Agricultural University (SAU).

References

Alam, M. F., & Thomson, K. J. (2001). Current constraints and future possibilities for Bangladesh fisheries. *Food policy*, 26(3), 297-313. https://doi.org/10.1016/S0306-9192(01)00005-7

Anderies, J. M., Janssen, M. A., & Ostrom, E. (2004). A framework to analyze the robustness of social-ecological systems from an institutional perspective. *Ecology and society*, 9(1). https://www.jstor.org/stable/26267655

Andrew, N. L., & Evans, L. (2011). Approaches and frameworks for management and research in small-scale fisheries. *Small-scale fisheries management: frameworks and approaches for the developing world* (pp. 16-34). CAB International, Oxfordshire,

Béné, C., Hersoug, B., & Allison, E. H. (2010). Not by rent alone: analysing the pro-poor functions of small-scale fisheries in developing countries. *Development Policy Review*, *28*(3), 325-358. https://doi.org/10.1111/j.1467-7679.2010.00486.x

Binder, C. R., Hinkel, J., Bots, P. W., & Pahl-Wostl, C. (2013). Comparison of frameworks for analyzing social-ecological systems. *Ecology and Society*, 18(4). http://dx.doi.org/10.5751/ES-05551-180426

Deb, A. K., & Haque, C. E. (2011). 'Sufferings Start from the Mothers' Womb': Vulnerabilities and Livelihood War of the Small-Scale Fishers of Bangladesh. *Sustainability*, *3*(12), 2500-2527. https://doi.org/10.3390/su3122500

Deb, A. K., & Haque, C. E. (2016). Livelihood diversification as a climate change coping strategy adopted by small-scale fishers of Bangladesh. In W. Leal Filho, H. Musa, G. Cavan, P. O'Hare, & J. Seixas. *Climate Change Adaptation, Resilience and Hazards* (pp. 345-368). Springer, Cham.

DoF. (2017). *Yearbook of Fisheries Statistics of Bangladesh 2016-17*. Fisheries Resources Survey System (FRSS), Department of Fisheries. Bangladesh : Director General, DoF, 2017. Volume 34 : p. 129

DoF. (2019). *Yearbook of Fisheries Statistics of Bangladesh, 2018-19*. Fisheries Resources Survey System (FRSS), Department of Fisheries, Bangladesh : Ministry of Fisheries and Livestock, 2019. Volume 36 : 135p.

Food and Agriculture Organization (FAO) (2012). *The state of world fisheries and aquaculture-2012*. www.fao.org/docrep/016/i2727e/i2727e.pdf

Ghose, B. (2014). Fisheries and aquaculture in Bangladesh: Challenges and opportunities. *Annals of Aquaculture and Research*, 1(1), 1-5.

Giri, S. S. (2018). An Overview of Small-scale Fisheries in South Asia. *Small-scale Fisheries in South Asia*, 1.

Hoq, M. E. (2007). An analysis of fisheries exploitation and management practices in Sundarbans mangrove ecosystem, Bangladesh. *Ocean & Coastal Management*, *50*(5-6), 411-427. https://doi.org/10.1016/j.ocecoaman.2006.11.001

Hossain, M. S., Sharifuzzaman, S. M., Rouf, M. A., Pomeroy, R. S., Hossain, M. D., Chowdhury, S. R., & AftabUddin, S. (2019). Tropical hilsa shad (*Tenualosa ilisha*): Biology, fishery and management. *Fish and Fisheries*, 20(1), 44-65. https://doi.org/10.1111/faf.12323

Islam, M. M. (2011). Living on the margin: the poverty-vulnerability nexus in the small-scale fisheries of Bangladesh. In *Poverty mosaics: Realities and prospects in small-scale fisheries* (pp. 71-95). Springer, Dordrecht.

Islam, M. M. (2012). *Poverty in small-scale fishing communities in Bangladesh: Contexts and responses* [Doctoral dissertation, Universität Bremen]. https://d-nb.info/1072046261/34

Islam, M. M., & Jentoft, S. (2017). Addressing disaster risks and climate change in coastal Bangladesh: using the Small-Scale Fisheries Guidelines. In S. Jentoft, R Chuenpagdee, M. J Barragán-Paladines, & N. Franz. *The Small-Scale Fisheries Guidelines* (pp. 521-539). MARE Publication Series, Springer, Cham.

Islam, M. M., Islam, N., Habib, A., & Mozumder, M. M. H. (2020). Climate Change Impacts on a Tropical Fishery Ecosystem: Implications and Societal Responses. *Sustainability*, *12*(19), 7970. https://doi.org/10.3390/su12197970

Islam, M. M., Pal, S., Hossain, M. M., Mozumder, M. M. H., & Schneider, P. (2020). Coastal Ecosystem Services, Social Equity, and Blue Growth: A Case Study from South-Eastern Bangladesh. *Journal of marine science and engineering*, 8(10), 815. https://doi.org/10.3390/jmse8100815

Islam, M. M., Shamsuzzaman, M. M., Mozumder, M. M. H., Xiangmin, X., Ming, Y., & Jewel, M. A. S. (2017). Exploitation and conservation of coastal and marine fisheries in Bangladesh: Do the fishery laws matter? *Marine Policy*, *76*, 143-151. https://doi.org/10.1016/j.marpol.2016.11.026

Islam, M. M., Shamsuzzaman, M. M., Sunny, A. R., & Islam, N. (2017). Understanding fishery conflicts in the hilsa sanctuaries of Bangladesh. In A. M. Song, S. D., Bower, P. Onyango, S. J. Cooke, R. Chunepagdee (Eds.) *Inter-Sectoral Governance of Inland Fisheries*,18-31. TBTI Publication Series. https://hdl.handle.net/20.500.12348/414

Jentoft, S., & Chuenpagdee, R. (2018). From poverty to wellbeing in small-scale fisheries: the governability challenge. In *Social wellbeing and the values of small-scale fisheries*, 293-315. Springer, Cham.

Kurien, J. (2015). Voluntary guidelines for securing sustainable small-scale fisheries in the context of food security and poverty eradication: summary. *Chennai: International Collective in Support of Fishworkers*. http://www.boblme.org/documentRepository/BOBLME-2015-Brochure-01.pdf

Mohammed, E. Y., Ali, L., Ali, S., Hussein, B., Wahab, M. A., & Sage, N. (2016). *Hilsa's non-consumptive value in Bangladesh: estimating the non-consumptive value of the hilsa fishery in Bangladesh using the contingent valuation method*. (IIED Working Paper) International Institute for Environment and Development, London. https://pubs.iied.org/pdfs/16626IIED.pdf

Ministry of Land memorandum Number Bhum/7/5/91/424 (12), Section 2, 1991.

Mozumder, M. M. H., Pyhälä, A., Wahab, M., Sarkki, S., Schneider, P., & Islam, M. M. (2019). Understanding social-ecological challenges of a small-scale hilsa (*Tenualosa ilisha*) fishery in Bangladesh. *International journal of environmental research and public health*, 16(23), 4814. https://doi.org/10.3390/ijerph16234814

Mozumder, M. M. H., Pyhälä, A., Wahab, M., Sarkki, S., Schneider, P., & Islam, M. M. (2020). Governance and Power Dynamics in a Small-Scale Hilsa Shad (*Tenualosa ilisha*) Fishery: A Case Study from Bangladesh. *Sustainability*, 12(14), 5738. https://doi.org/10.3390/su12145738

Rahman, M. A., Lee, S. G., Molla, M. H. R., & Asare, O. E. (2018). Fisheries management and governance in Bangladesh. *MOJ Eco Environ Sci*, *3*(6), 381-385. https://doi.org/10.15406/mojes.2018.03.00117

Seggel, A., & De Young, C. (2016). Climate change implications for fisheries and aquaculture: summary of the findings of the Intergovernmental Panel on Climate Change Fifth Assessment Report. FAO Fisheries and Aquaculture Circular, No. 1122. Rome, Italy. https://www.fao.org/3/i5707e/i5707e.pdf

Shamsuzzaman, M. M., Islam, M. M., Tania, N. J., Al-Mamun, M. A., Barman, P. P., & Xu, X. (2017). Fisheries resources of Bangladesh: Present status and future direction. *Aquaculture and Fisheries*, *2*(4), 145-156. https://doi.org/10.1016/j.aaf.2017.03.006

Shamsuzzaman, M. M., Mozumder, M. M. H., Mitu, S. J., Ahamad, A. F., & Bhyuian, M. S. (2020). The economic contribution of fish and fish trade in Bangladesh. *Aquaculture and Fisheries* *5*(4), 174-181. https://doi.org/10.1016/j.aaf.2020.01.001

Shamsuzzaman, M., Xiangmin, X., & Islam, M. M. (2016). Legal status of Bangladesh fisheries: Issues and Responses (pp. 1474-1480) NISCAIR-CSIR, India http://nopr.niscair.res.in/handle/123456789/38619

Shamsuzzaman, Md., Xiangmin, X., Karim, E., & Tania, N. (2017). Review of fisheries legal framework of Bangladesh: Towards policy implications. *Indian Journal of Geo-Marine Sciences*, *46*(01), 16–22. http://nopr.niscair.res.in/handle/123456789/40623

Sultana, P., & Thompson, P. M. (2007). Community based fisheries management and fisher livelihoods: Bangladesh case studies. *Human Ecology*, 35(5), 527-546. https://doi.org/10.1007/s10745-006-9092-3

Sunny, A. R. (2017). Impact of oil Spill in the Bangladesh Sundarbans. *International Journal of Fisheries and Aquatic Studies*, 5(5), 365-368. https://doi.org/10.1007/978-3-319-71093-8_5

Sunny, A. R., Ahamed, G. S., Mithun, M. H., Islam, M. A., Das, B., & Rahman, A. (2019). Livelihood Status of The Hilsa (*Tenualosa ilisha*) Fishers: The Case Of Coastal Fishing Community of The Padma River. Bangladesh. *J Coast Zone Manag*, 22(2), 469. https://www.longdom.org/open-access/livelihood-status-of-the-hilsa-emtenualosa-ilishaem-fishers-the-case-of-coastal-fishing-community-of-the-padma-river-ban.pdf

Sunny, A. R., Islam, M. M., Rahman, M., Miah, M. Y., Mostafiz, M., Islam, N., ... & Keus, H. J. (2019). Cost effective aquaponics for food security and income of farming households in coastal Bangladesh. *The Egyptian Journal of Aquatic Research*, *45*(1), 89-97. https://doi.org/10.1016/j.ejar.2019.01.003

Sunny, A. R., Sazzad, S. A., Prodhan, S. H., Ashrafuzzaman, M., Datta, G. C., Sarker, A. K., ... & Mithun, M. H. (2021). Assessing impacts of COVID-19 on aquatic food system and small-scale fisheries in Bangladesh. *Marine Policy*, 126, 104422. https://doi.org/10.1016/j.marpol.2021.104422

Symes, D. (2006). Fisheries governance: a coming of age for fisheries social science? *Fisheries research*, *81*(2-3), 113-117. https://doi.org/10.1016/j.fishres.2006.06.015

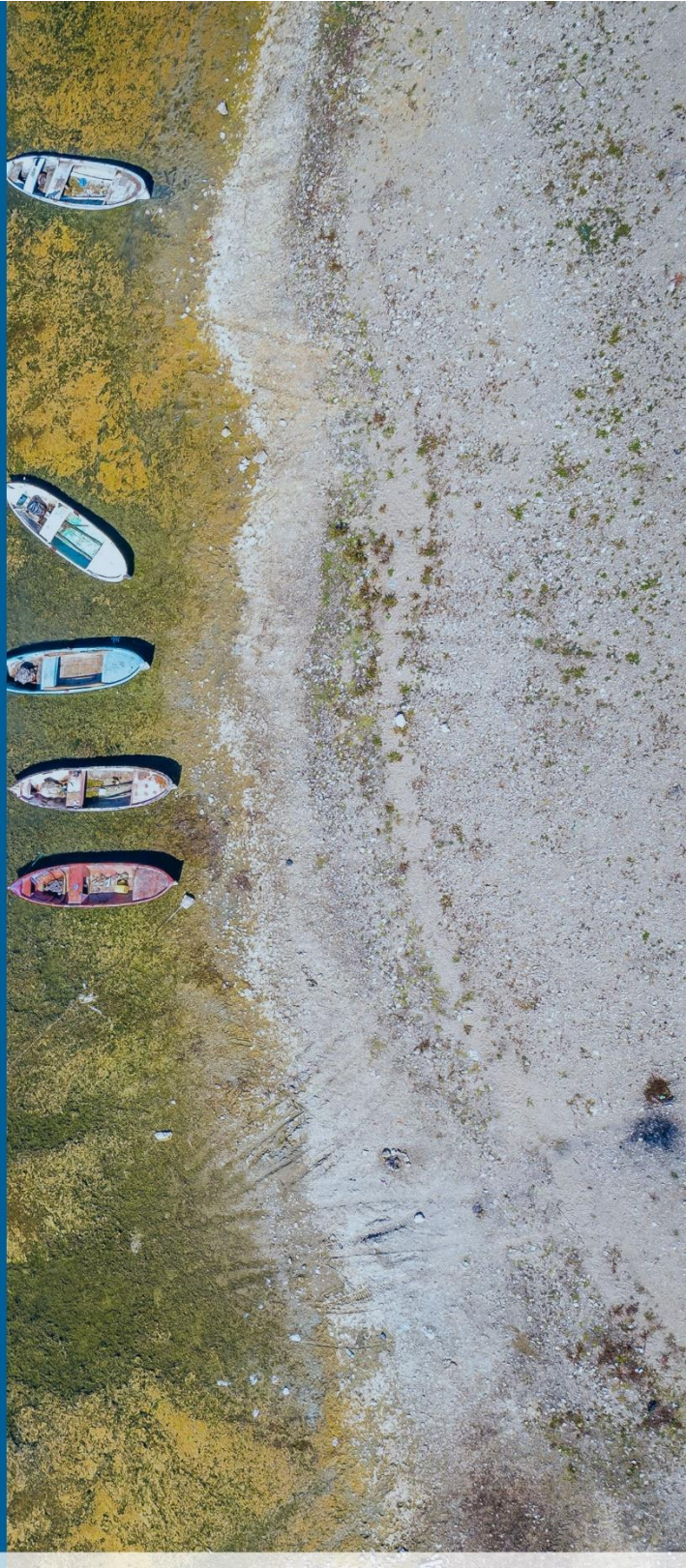
The WorldFish Center. (2007). *Towards Sustainable Coastal and Marine Capture Fisheries in Bangladesh: Initiating a Precautionary Approach* .85. The World Fish Center, Bangladesh and South Asia Office, Dhaka.

The WorldFish Center. (2010). Liquid assets: community-based Fisheries management in Bangladesh..

Vulnerability to Viability (V2V) Global Partnership

The Vulnerability to Viability (V2V) project is a transdisciplinary global partnership and knowledge network. Our aim is to support the transition of small-scale fisheries (SSF) from vulnerability to viability in Africa and Asia. Vulnerability is understood as a function of exposure, sensitivity and the capacity to respond to diverse drivers of change. We use the term viability not just in an its economic sense but also to include its social, political, and ecological dimensions.

The V2V partnership brings together approximately 150 people and 70 organizations across six countries in Asia (Bangladesh, India, Indonesia, Japan, Malaysia, Thailand), six countries in Africa (Ghana, Malawi, Nigeria, Senegal, South Africa, Tanzania), Canada and globally. This unique initiative is characterized by diverse cultural and disciplinary perspectives, extensive capacity building and graduate student training activities, and grounded case studies from two regions of the world to show how and when SSF communities can proactively respond to challenges and creatively engage in solutions that build their viability. Further information on the V2V Partnership is available here: www.v2vglobalpartnership.org.



V2V Global Partnership Secretariat
School of Environment, Enterprise and Development,
Faculty of Environment
200 University Avenue West, EV 3
University of Waterloo, Waterloo, ON, N2L 3G1 Canada
Website: www.v2vglobalpartnership.org
Email: v2vglobalpartnership@gmail.com

VULNERABILITY TO VIABILITY
GLOBAL PARTNERSHIP

V2V WORKING PAPER SERIES