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# Reflections from Chilika-V2V Field School: Hope is not Lost: Justice and Equity in a Thriving Lagoon

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## V2V Working Paper Series

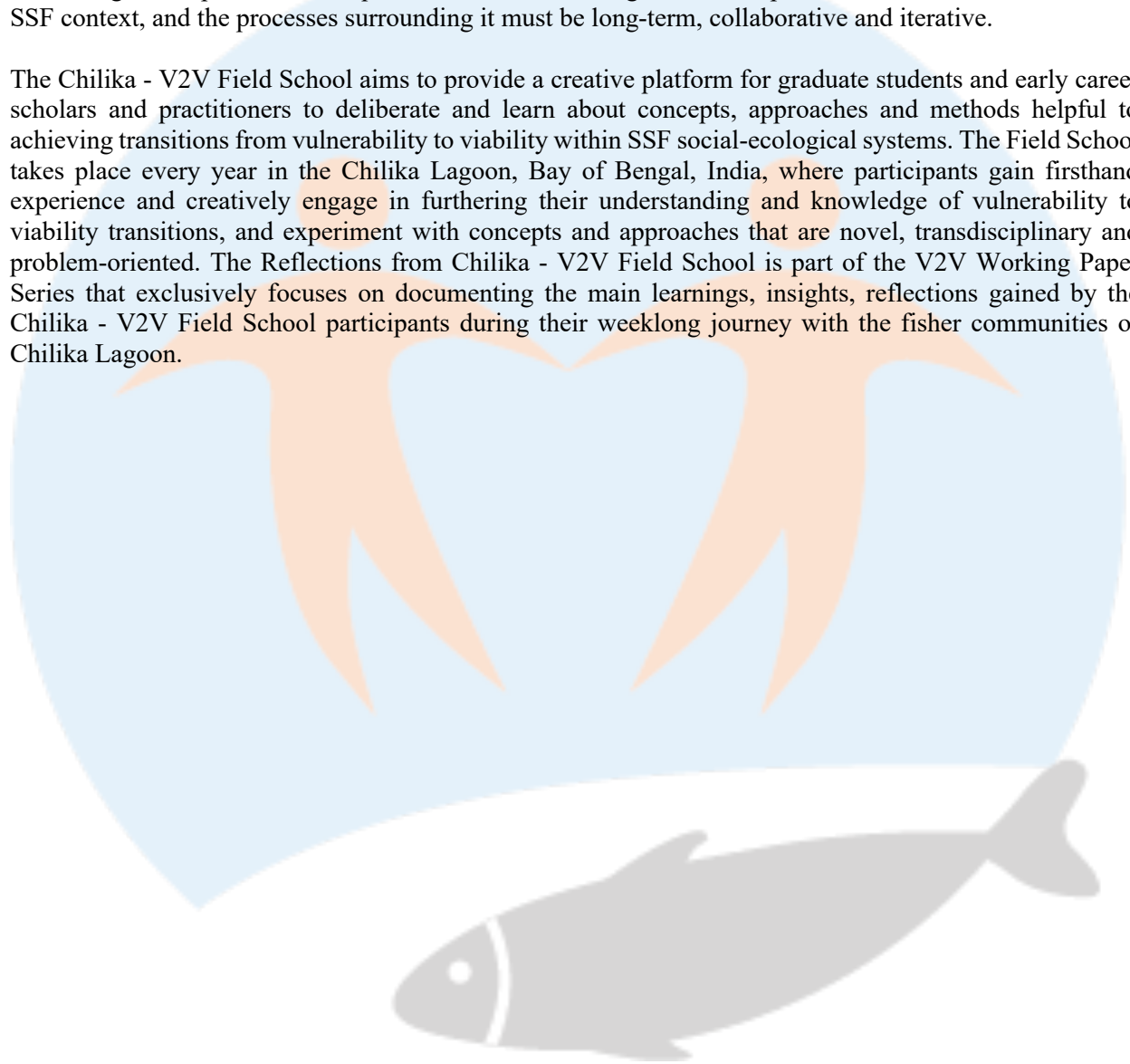
V2V Global Partnership “Working Paper Series” aims to facilitate the exchange of ideas, mobilize knowledge and generate broad-based discussions on vulnerability-viability themes within the context of small-scale fisheries. The Working Paper Series will provide a collaborative and interactive platform 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](mailto:v2vglobalpartnership@gmail.com).



## Reflections from Chilika-V2V Field School

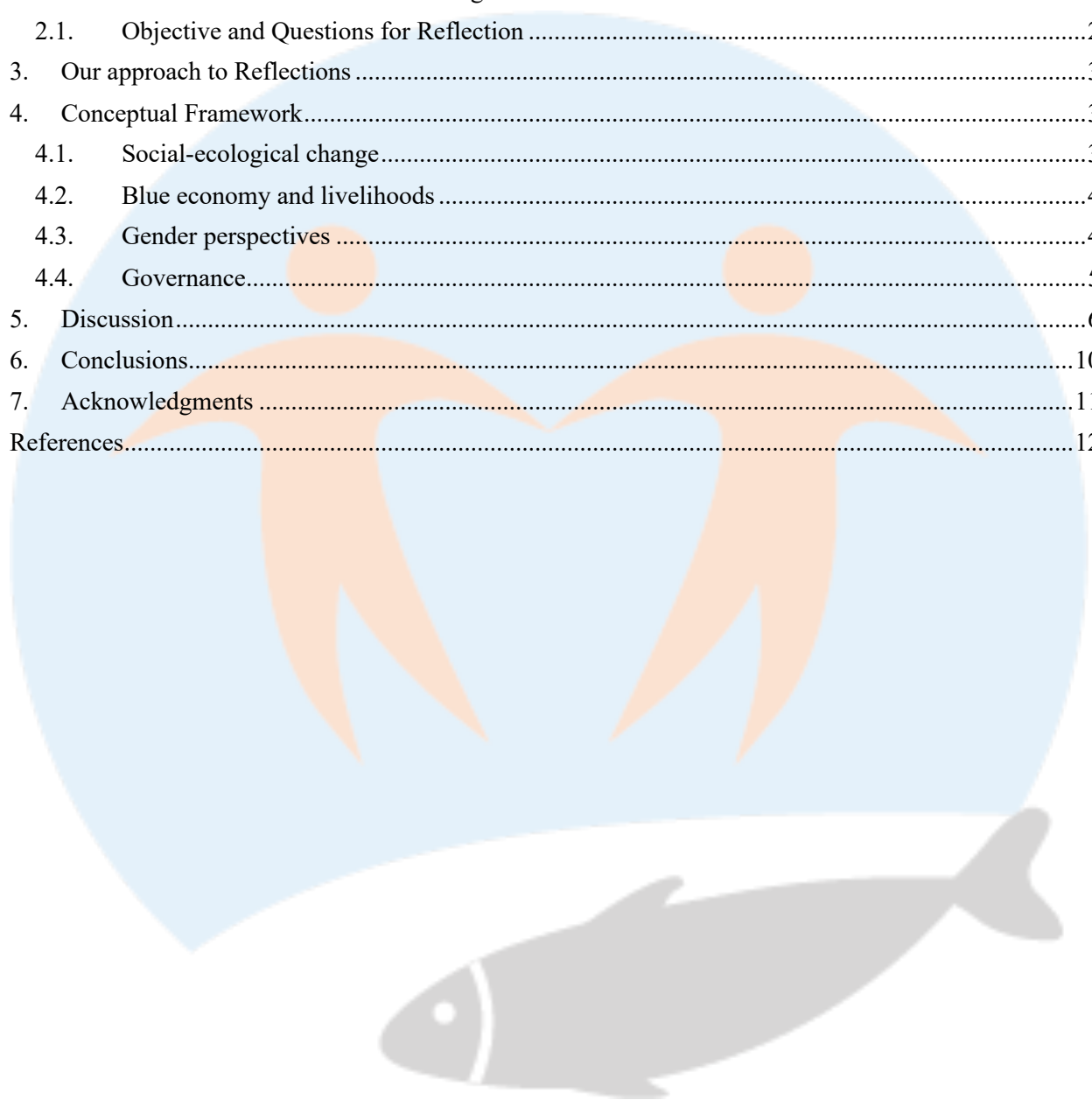
Small-scale fisheries (SSF) are important social-ecological systems across all parts of the world. Strongly anchored in local communities, SSFs reflect a way of life, and they provide critical contributions. Yet, their efforts and their existence are often overlooked as many SSF communities remain economically and politically marginalized, are highly vulnerable to change, and remain invisible in policy debates. Nonetheless, the continuity of many SSFs suggests certain strengths and forms of resilience. A holistic understanding of what causes vulnerability, as well as what makes fisheries social-ecological systems viable and through what processes is required. This understanding needs to be place based and situated within the SSF context, and the processes surrounding it must be long-term, collaborative and iterative.

The Chilika - V2V Field School aims to provide a creative platform for graduate students and early career scholars and practitioners to deliberate and learn about concepts, approaches and methods helpful to achieving transitions from vulnerability to viability within SSF social-ecological systems. The Field School takes place every year in the Chilika Lagoon, Bay of Bengal, India, where participants gain firsthand experience and creatively engage in furthering their understanding and knowledge of vulnerability to viability transitions, and experiment with concepts and approaches that are novel, transdisciplinary and problem-oriented. The Reflections from Chilika - V2V Field School is part of the V2V Working Paper Series that exclusively focuses on documenting the main learnings, insights, reflections gained by the Chilika - V2V Field School participants during their weeklong journey with the fisher communities of Chilika Lagoon.



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# Reflections from Chilika-V2V Field School: Hope is not Lost: Justice and Equity in a Thriving Lagoon

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## 1. Introduction

Within capture fisheries, small-scale fishers (SSF) comprise a minimum of 40% of the global catch, and in turn, this provides employment to over 60 million people involved in various parts of the value chain (FAO, Duke University & World Bank, 2023). This number is not insignificant, as globally, it accounts for approximately 90% of those involved in fisheries (FAO, Duke University & World Bank, 2023). Not only does SSF contribute to the economy, but it is critical to poverty alleviation and food security, especially within developing countries (Béné & Neiland, 2006; Muzuka et al., 2011; Dias et al., 2023). Despite these significant contributions, the SSF sector has been significantly threatened by fish decline, leading to poor income and food and nutritional insecurity for SSF (FAO, 2022). In addressing such crisis and enhancing blue growth, countries such as Tanzania, Chile, France, and the United Kingdom have marginalized SSF, resulting in gender inequity in the decision-making process (Schreiber et al., 2022; Gustavsson et al., 2021).

Here, we define Blue Justice and Equity as encompassing four intertwined subcategories: social-ecological change, blue economy and livelihoods, gender perspectives, and governance. The blue economy concept has been gaining momentum to promote sustainability within the ocean. This term was initially coined at the 2012 UN Conference on Sustainable Development (UNCSD) and refers to a wide range of policies that support ocean-related economic initiatives, resulting in instantaneous environmental, social, and economic benefits (Schutter et al., 2021; Silver et al., 2015). The World Bank (2017 p.1) defines the blue economy as the “sustainable use of ocean resources for economic growth, improved livelihoods and jobs while preserving the health of ocean ecosystems.” The term “Blue Justice” was first used by Moenieba Isaacs in 2018 at the 3<sup>rd</sup> World Small-Scale Fisheries Congress held in Chiang Mai, Thailand (Jentoft et al., 2022). Blue justice “refers to the recognition, meaningful involvement and fair treatment of all coastal people with respect to how ocean and coastal resources are accessed, used, managed and enjoyed (Table 1)” (Blythe et al., 2023, p.3).

The blue justice concept was created to illuminate the inequities and injustices asserted against coastal communities, mostly in the case of the blue economy concept. Academics have recognized that the success and failures of small-scale fishers are dependent on their social dimensions; these include factors such as livelihoods, equity, and well-being (Ayilu et al., 2022; Bennett et al., 2021). Social justice cannot be achieved without considering the feedback loops that are present between social and ecological systems that influence the overall dynamics of the system (Folke et al., 2011).

## 2. Context for Reflections: The Chilika Lagoon

The context in which we are examining issues of justice comes from Chilika Lagoon, India. Chilika Lagoon is “pear-shaped” and is situated on the eastern coast of the Bay of Bengal. It contains 52 rivers that drain into the Chilika Lagoon (Nayak et al., 2016). It is a Ramsar site of international conservation importance, and it is believed to be 5000 years old (Nayak et al., 2016; Sahu et al., 2014). Within Asia, Chilika is the largest brackish water lagoon and is located between the longitude 85°05’ to 85°38’E and latitude of 19°28’ to 19°54’N (Nayak et al., 2016). Chilika Lagoon is separated into four sectors, including Southern Central, Northern, and the Outer Channel; these locations have been demarcated based on water characteristics and fish production (Nayak et al., 2016). The lagoon is found within districts Puri, Khurda, and Ganjam (Sahu et al., 2014). The lagoon water depth ranges from 0.38 to 0.49 m depending on the season (Nayak et al., 2016), while the area ranges from a minimum of 704 Km<sup>2</sup> to a maximum of 1020 Km<sup>2</sup> (Sahu et al., 2014). A large amount of biodiversity exists within the lagoon. There are 225 fish, 35 crab, and 28 shrimp/prawn species within Chilika, many of which are endemic (Nayak et al., 2016a), and approximately 400,000 fishers in over 150 villages rely upon Chilika to support their livelihoods (Nayak et al., 2016b). The occupation of Chilika fishers was traditionally determined by their lower positioning within Hindu castes, consisting of seven castes and five subcastes (Nayak, 2014; see Table 1, p.4). Historically, 0.8 million non-fishers belonging to the higher caste (e.g., Brahmins, Karans, Kandayat) indirectly relied on Chilika through their forestry, farming, and other occupations.

**Figure 1**

*Profile of fishers cast groups in Chilika Lagoon (Source: Nayak, 2014, p.4)*

Fisher castes and groups	Profile
1. <i>Keuta</i> or <i>Kaibartya</i>	Largest group in Chilika; mostly educated; live on all sides of the lagoon; occupy the top in the fisher caste hierarchy.
1.a. <i>Dewar Kaibartya</i>	Live on the east and west side; traditionally rowed commuter boats but later took up fishing as main occupation.
1.b. <i>Hula Hania Keuta</i>	Live on the west side; use a variety of gear to focus on specific fish species; fish mostly during night.
1.c. <i>Bilua Keuta</i>	Use a variety of nets and fish in groups by making sounds like a fox ( <i>bilua</i> ) to divert the fish to the nets.
1.d. <i>Chudutia</i> or <i>Chudakuta Keuta</i>	Customarily prepared pressed rice ( <i>chuda</i> ) for the world famous Puri Jagannath temple; were primarily engaged in small grocery businesses and farming; in recent times fully engaged in fishing and fish related activities.
1.e. <i>Kaibartya</i>	Customarily engaged in making all types of boats for lagoon fishers; now fully engaged in fishing and fish related activities.
2. <i>Niari</i> or <i>Liyari</i>	Very few in numbers; customarily prepared puffed rice ( <i>liya</i> and <i>ukhuda</i> ) and sold at the fish landing sites and fish markets; engaged in fishing of anchovy ( <i>patua</i> ).
3. <i>Karetia</i>	Live on the west side of Chilika but their fishing areas are mainly on the east side; used handmade cotton nets but recently moved to nylon/synthetic nets.
4. <i>Gokha</i>	Very few in numbers; live on east side of Chilika; customarily used <i>khadi-jala</i> (nets) and <i>khepa-jala</i> (nets) but have shifted to nylon/ synthetic nets.
5. <i>Khatia</i> or <i>Katia</i>	Located on the east and west side of Chilika in large villages; primarily use drag nets; economically better off; their caste panchayat includes nine villages (known as <i>Naa-desha</i> or nine nations) within which all their marriages take place.
6. <i>Kandara</i>	Second largest fisher caste group and at the bottom of fisher caste hierarchy; live all around the lagoon; primarily use different types of traps made out of bamboo for fishing; fish different types of prawns.
7. <i>Tiara</i>	Live on the east and west side of the lagoon; use bamboo made traps for fishing.

### 2.1. Objective and Questions for Reflection

The objective of this paper is to develop a reflective story based on ‘Justice and Equity’ in the Chilika Lagoon social-ecological systems. The three questions below have been developed to fulfil the objective of this study.

1. What is justice and equity in the context of small-scale fisheries?
2. Have small-scale fishery communities faced injustice and inequity in the past, and is it comparable to what is being faced now?
3. Can potential opportunities in the Blue Economy be identified to enhance fisheries co-management?

### 3. Our approach to Reflections

We visited Chilika Lagoon as part of a field school during 12th and 19th of August, 2023, and gained insights into the equity and justice issues in the fishing communities mainly through three steps. First, preorganised visits to the small-scale fishery communities in Chilika Lagoon were made. Despite the numerous studies done around the lagoon, the ecosystem around it remains vulnerable, from growing issues of food insecurity, unsustainable fishing practices, frequent natural disasters and the continued effects of the COVID-19 pandemic, for example, lower fish prices. In-person discussions with the fishers and fish processors provided direct insight into their most recent experiences and any new outlook they may have. The second step involved visits to the fish market and processing facilities. Aside from direct observations and desk research, it was important to have a first-hand experience of these important sites relating to Chilika Lagoon SSF. Finally, all insights gained were categorized based on selected themes and where they fit in the time-lapse within the conceptual framework. Themes under the conceptual framework include justice and equity, Blue Economy and Livelihoods, gender perspectives, governance, and social-ecological change.

**Figure 2**

*Those images are from within and around the lagoon, showing common activities that take place on a daily basis, from making the fishing nets to fishing and processing*



### 4. Conceptual Framework

Justice and equity of small-scale fisheries are linked to some interconnected thematic areas. In the case of small-scale fisheries in the Chilika Lagoon, justice and equity can be drawn from the thematic areas, including the social-ecological change, blue economy and livelihoods, gender perspectives, and governance. These areas are interconnected to each other and intervene in justice and equity concerns of social-ecological systems. As presented in Figure 2, this section will describe how these are interconnected and what intervention they bring to justice and equity discussion using the following conceptual framework.

#### 4.1. Social-ecological change

The understanding of the social-ecological systems (SESs) is the relationship between human and ecological components. Ostrom (2009) suggests that all humanly used resources, including fisheries, lakes, and forests, are embedded in complex SESs. Of these resources, in an SES, the social and bio-physical agents interact at multiple temporal and spatial scales (Janssen and Ostrom, 2006). The development of societies (e.g., hunter-gatherer, agricultural, and industrial) over time has largely affected the natural resources and driven the SES transition. The social-ecological transitions, especially traditional to industrial, are observed in fisheries (Bavinck, 2011). The result of industrialization led to the overexploitation of most of the global fish stock (Bavinck, 2011). As a consequence, the socio-economic



aspects of millions of poor small-scale fishers are in danger as a negative social outcome. From an ecological point of view, aquatic biodiversity is also likely to be altered.

The exploitation of natural resources and their ecological system for human needs causes large-scale changes to the overall interconnected SESs. Social-ecological changes and subsequent governance interventions are associated with the major concerns of fisheries, for instance, social justice (Nayak, 2022). Feedback between SES can create an undesirable state that might be difficult to reverse (Cinner, 2011). For example, social-ecological factors, such as lack of alternative income options, reduced fish stock, etc., increase small-scale fisheries' dependency on fisheries resources, leaving them little freedom to make choices to improve their situations (Baker et al., 2018; Cole et al., 2018). The negative outcomes of resource dependency include reduced fish stock, loss of biodiversity, destructive fishing, and, ultimately, unsustainable utilization of resources (Islam, 2011; Islam and Hossain, 2017). Consequently, small-scale fishers are exposed to different vulnerabilities, such as reduced income, indebtedness, conflicts among the fishers, and migration to cities for alternative livelihood (Nayak and Berkes, 2019).

## **4.2. Blue economy and livelihoods**

One of the main criticisms of the Blue Economy concept is that justice for small-scale fisheries is missing in the blue growth/revolution of the nations' development plans (Said and MacMillan, 2020). Jentoft and Chuenpagdee (2022) note that the rights and access for small-scale fisheries are threatened by the Blue Economy/Growth initiatives. Small-scale fisheries are largely marginalized and disempowered in the countries' Blue Growth development plan (Linke et al., 2022). It is argued that governments are biased toward industrial fisheries, given their contribution to economic wealth (Said and MacMillan, 2020), while little appreciation is paid to small-scale fisheries. The traditional values, culture, roots, and history that small-scale fisheries represent are downgraded to the industrialization of rural life (Jentoft and Chuenpagdee, 2018). In some cases, the tendency to neglect the norms and values of small-scale fishers is underrepresented as an evolutionary process and promotes industrial fisheries as inevitable progress and modernization of the fisheries societies.

Further, small-scale fisheries are in a competitive relationship with industrial fisheries in terms of space for fishing, using the same resources, and selling to the same markets (Jentoft and Chuenpagdee, 2018). It is unjust that industrial fishers are overcapitalizing their capacity and limiting small-scale fishers' space for fishing (Said et al., 2018). At the same time, industrial fisheries have squeezed out small-scale fisheries, resulting in inequity. The expansion of the fisheries supply chain through globalization benefits certain stakeholders. The local elite people with access to market information and capital are better positioned to take advantage of new fisheries products' trade opportunities. Unequal distribution of benefits is a common practice among trade actors. The processors, middlemen, and other trading partners accumulate the most wealth in the trade over the producer, i.e., small-scale fishers, resulting in inequity (Bjorndal et al., 2014).

## **4.3. Gender perspectives**

The number of women in the fisheries sector is increasing day by day. The major workforce in the post-harvest processing of fish consists of women (FAO, 2022; Zelasney et al., 2020). Although the involvement of women in fisheries is encouraging, still the role and contribution of women are invisible, unrecognized, undervalued, and underrepresented (Fitriana, 2012; Santos, 2015; Deb et al., 2015). Women often face discrimination based on their identity, culture, religion, and social structure (Koralagama et al., 2017).

In this current era of modern fisheries, access to resources and markets is also gendered (Holmes and Jones, 2011; Thorpe et al., 2014). Women fishers are the most underrepresented and undervalued in the development of fisheries, given their role in the post-harvest supply chain and at home. The development of fisheries has increased the involvement of women fishers, which is encouraging. At the same time, the

tendency associated with women fishers facing diverse conditions, obstacles, and challenges to get fish access (Lentisco and Lee, 2015) has increased. For example, in many cases, widowed, divorced, or single women fishers use transactional sex to have access to fisheries resources and to survive in the male-dominated fisheries industry (see, for example, Medard, 2012; Lwenya and Yongo, 2012). Especially young women and those with disabled husbands are more susceptible to sexual harassment (Lwenya and Yongo, 2012; Medard, 2012; Deb et al., 2015) in exchange for getting access to fisheries.

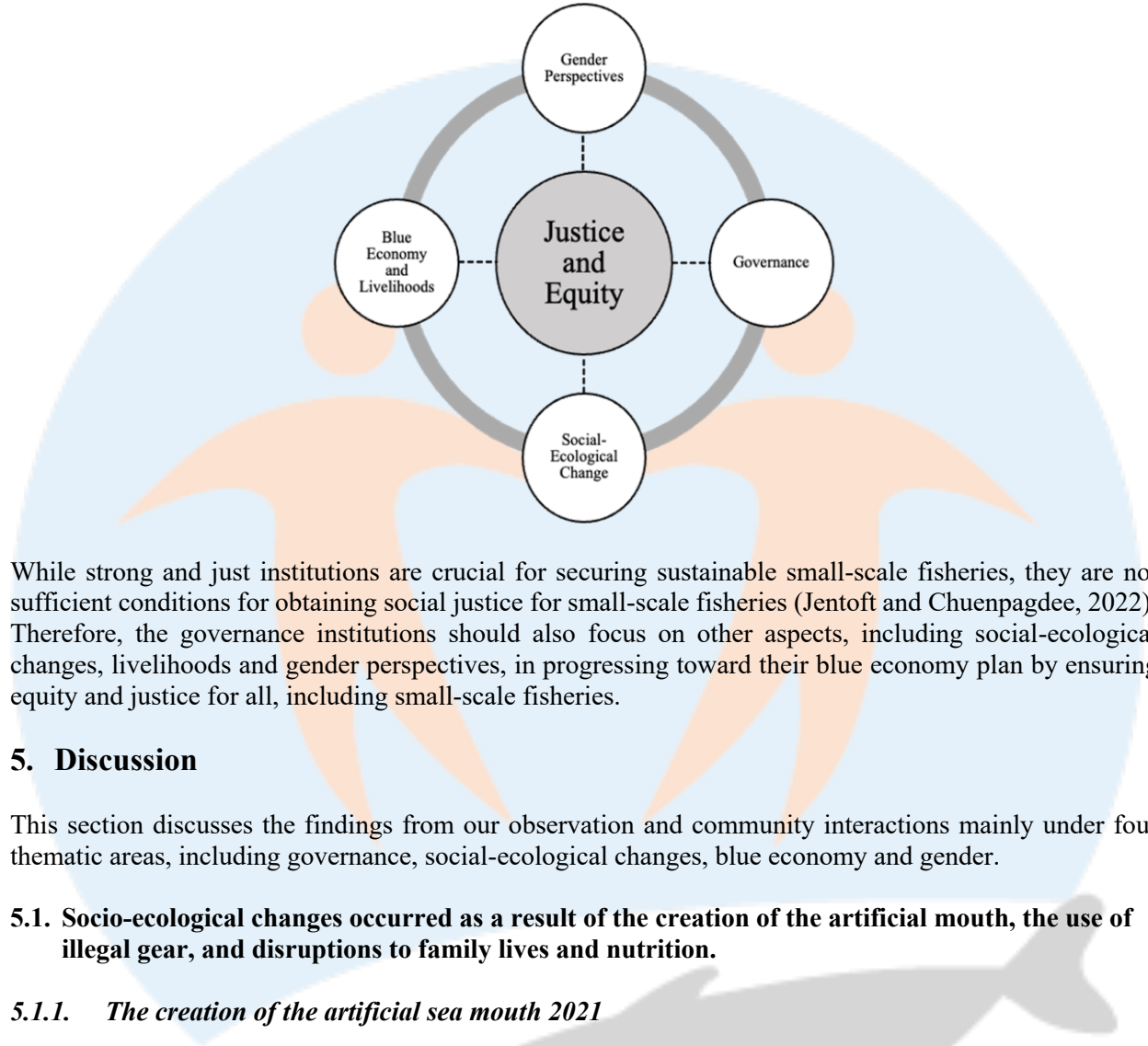
Women involved in the post-harvest fisheries supply chain are often discriminated against in many ways; for instance, they get lower wages than their male counterparts (Briceño-Lagos and Monfort, 2020). Research also points to different gender-based constraints for women involved in fisheries supply chains, including a lack of personal safety for women retailers (Hendy, 2015), limited freedom of mobility for them (El-Hamidi, 2011), and unequal distribution of family income (ILO, 2013). Another dimension within small-scale fisheries that has garnered minimal attention is gender. Forty percent of people involved in small-scale fisheries are women, accounting for a total of 45 million women (Illuminating Hidden Harvests, 2023). Despite their pivotal contributions to harvesting, marketing, and food preparation, women's roles within small-scale fisheries have been overlooked in policy, management, and economics (Sharma et al., 2022). More specifically, the role of women involved in governance has been overlooked. Women's contributions to governance are constrained by gendered power relations, household duties, gender norms, and limited control and access to resources (Galappaththi et al., 2022).

#### **4.4. Governance**

The social, natural, and political issues related to fisheries are fundamentally complex, diverse, and dynamic (Jentoft and Chuenpagdee, 2009). Related to governance, several factors, such as weak governance or low capacity, lack of relevant stakeholders' participation, unfair rules and regulations, inappropriate institutions, and weak fishers' organizations, make small-scale fisheries vulnerable (Islam and Chuenpagdee, 2022). The majority of the small-scale fisheries' vulnerabilities are related to weak governance (Chuenpagdee and Jentoft, 2018). Sometimes, the decision-makers come up with new or modified rules and regulations without consulting with the fishing communities, which later seems unfit from small-scale fisheries perspectives (Lyons et al., 2016; Sowman and Raemaekers, 2018). For example, in Bangladesh, small-scale fisheries find the annual two-month (Jan-Feb) crab fishing ban unjust and inefficient in revitalizing the crab stock (Miah et al., 2022). Indeed, these decisions affect small-scale fisheries in different ways, for instance, by causing a lack of equity in distributing benefits and biased treatment towards industrial fisheries (Satumanatpan and Pollnac, 2020). The government-imposed policies are more likely to favour industrial fisheries, although the majority of people rely on small-scale fisheries due to their inefficient fishing and low revenue (Jentoft and Chuenpagdee, 2018; Said and MacMillan, 2020). Small-scale fisheries are less represented in the fisheries governance at different levels in many cases (Linke et al., 2022).

**Figure 3**

*The conceptual framework of Justice and Equity for small-scale fisheries. The framework draws links to the gender perspectives, governance, social-ecological changes and blue economy livelihoods and how they result in justice and equity issues for small-scale fisheries*



While strong and just institutions are crucial for securing sustainable small-scale fisheries, they are not sufficient conditions for obtaining social justice for small-scale fisheries (Jentoft and Chuenpagdee, 2022). Therefore, the governance institutions should also focus on other aspects, including social-ecological changes, livelihoods and gender perspectives, in progressing toward their blue economy plan by ensuring equity and justice for all, including small-scale fisheries.

## **5. Discussion**

This section discusses the findings from our observation and community interactions mainly under four thematic areas, including governance, social-ecological changes, blue economy and gender.

### **5.1. Socio-ecological changes occurred as a result of the creation of the artificial mouth, the use of illegal gear, and disruptions to family lives and nutrition.**

#### **5.1.1. The creation of the artificial sea mouth 2021**

Chilika Lagoon is an ecosystem of Fresh, Brackish, and Marine waters. This made the lagoon ecologically delicate. To the best of our knowledge, the dredging of the sea mouth to create an artificial river mouth was constructed without the required wide consultation, scientific/ecological consideration, and stakeholder participation. The perceived intentions were to increase the salt saturation in the Chilika lagoon and thereby increase the water productivity. The small-scale fishers, with indigenous knowledge from years of experience, traditions, and folk tales, were not documented to have had inputs into the decision to construct the artificial mouth. The injustice in the creation of the artificial mouth was the resulting changes in the ecology of the water and, thereby, of the fishing environment, the biodiversity of the ecosystem in the form of species composition, abundance of fish, and the sizes of fish.

The negative impacts of the creation of the artificial sea mouth were the subsequent poor quality of the catches, the introduction of new species, and reduction in catch volumes, suspicion, and conflicts among fishing communities. The fishers earned less due to the reduction in fish stocks because of the ecological changes caused by the prevailing changes due to pollution from aquaculture and tourism. The financial performance of the fishers was negatively affected. There was no reported increase in the cost of the fish because of a reduction in the volume of the catches. These changes have contributed negatively to the socio-economic life, livelihood of fishers, and general economic growth of the lagoon. Mother nature, however, re-addressed the injustice occasioned by the creation of the artificial mouth by closing it up. The sand that was dredged to create the mouth gradually moved back into position, sealing up the extra non-natural mouth. Salt water could no longer pass through from the channel (mouth) because it had been filled back with sand.

### ***5.1.2. Use of illegal fishing gear***

The operators of shrimp aquaculture on Chilika Lagoon introduced the use of zero nets, which were otherwise not used by the small-scale fish farmers. The small-scale fish farmers, therefore, adopted the use of these nets, which guaranteed a larger volume of fish catch. The catch may not be of quality fish in terms of size. The cheap nylon nets easily got caught in the gills of the fish, catching virtually everything in the water, including juvenile fish. Both the shrimp aquaculturists and the small-scale fish farmers had no consideration for the conservation of the stock but for immediate gain from larger volumes of catch. The injustice in allowing the use of zero nets, which are poor quality monofilament nylon nets, by a group of new entrants (fish and shrimp aquaculturists) into otherwise exclusively reserved caste fishing operations was a clear case of inequity in the treatment of fishers. The fisher's decision to adopt the use of the zero net was a clear demand for fair treatment.

### ***5.1.3. Disruptions to Family Lives***

It was observed that the injustices and equity-related issues from the aquaculture and shrimp culture had devastating socio-cultural and economic effects on the family lives of the fishers. Their lives before aquaculture were described as flourishing. However, the pollution of the water from shrimp farming led to a reduction in fish catches and habitat loss. There was a reported decrease of about 60% of the fish stock (Samal, 2002). The catches could no longer support the livelihoods of the fishers communities. The ecological changes affected what locals are and are not able to do in terms of livelihood practices, such as the men not being able to take care of their families adequately. They spent less time fishing and more time on other activities. The men moved out of their homes and communities to other regions to earn incomes from other menial labour jobs and trading activities. Life became unbearable for the women who were now left on their own to cater for themselves and their families. Women who previously were not working became the breadwinners. To support the families, the women had to go out, leaving the children on their own without parental guidance. The women were not paid commensurate wages for their efforts. The demography of the societies changed, with only women and children seen in the communities. Family life became difficult, and the women with their children lived under poor conditions with poor sanitation. They were, therefore, prone to different types of communicable and waterborne diseases caused by, for instance, E. coli. This was a direct result of open defecations, which were washed untreated into the lagoon. The per capita consumption of fish in coastal communities decreased appreciably due to poor fish catches. The children were fed more vegetables grown with fertilizers instead of fish. The residues from fertilizers had serious effects on the health of children. The dietary changes resulted in observed itchy and dry skin conditions among the children.



#### **5.1.4. Nutrition**

Fish is an integral part of the human diet, providing an important source of animal protein and nutrition to its consumers. The dynamic contribution of fisheries and aquaculture to global food security and economic growth cannot be overlooked. The new gender roles concerning social-ecological changes have long-term effects on fishers' lives. In recent times, the fishers and their families were not getting enough fish from the lagoon to meet their demand for fish to eat after selling part of their catches. They were, therefore, deprived of good protein nutrition. As a result, they suffered from various diseases, including skin issues like itching.

### **5.2. Blue economy and livelihoods will be considered on the aspects of aquaculture and shrimp farming development and tourism on the Chilika lagoon**

#### **5.2.1. Aquaculture and Shrimp Farming**

Globalization, the economic benefits, and opportunities created through international trade opened Chilika Lagoon to shrimp aquaculture. The government or policymakers that made decisions and regulations for aquaculture and shrimp farming on the Chilika Lagoon did not have consultations with the fishers or local communities. The practice of aquaculture on the Chilika lagoon led to many changes in the small-scale fisheries communities. With the poor catches, the average income of a fisherman was 250 per day (rupees), which is below the poverty line. A kilogram of fish was said to be 500 (rupees). To compound the problem, the aquaculture operations hired people from outside of the communities and so did not offer occupational benefits as alternatives to the disruptions to their source of livelihood. The fishers society, and especially the women, were dissatisfied with the socio-economic consequences of the shrimp aquaculture in Chilika Lagoon. The men moved from the villages to find work elsewhere, while the women had to work to take care of themselves and their children. In previous times, the caste system did not allow a man to marry his daughter to a small-scale fisherman if she was from a higher caste. However, because of economic profits, the caste system was overruled for those who would otherwise not be found practicing any form of fishing activities to be involved in shrimp culture. The injustice was also obvious from the point of the existing system of fishing alone that was overruled to favour the elite to practice aquaculture within the same operating space.

#### **5.2.2. Tourism on the Chilika Lagoon**

Tourism on Chilika Lagoon is carried out by both the government and small-scale operators, who are sponsored by cooperatives formed by small-scale fish farmers. The government tourism structure operates bigger boat facilities than the small-scale fishers. The fishing areas for small-scale fishers became restricted because of the bigger tourist boats. In addition, the larger boats pollute the water, and the noise from their engine disturbs the fish. The fishers demand for the reduction of the sizes of the bigger boats was to seek redress and ensure fair access within their operating space. The heavy pollution from the emission of smoke and noise by the frequent movements of these boats disrupted the fish behaviour and the ecosystem. The fish were no longer within the easy reach of fishers, and mortality increased from particle pollution, which caused the clogging of their gills. Therefore, the fishing catches decreased in volume because of the loss of fishing space, pollution of the environment and migration of the fish from the polluted waters. The tourist boats also became a source of competition with fishers on the use of the waterways. This often resulted in conflicts. The fishers were often disadvantaged because of poor economic power and their low status in the caste system. A clear injustice can be seen at Satapada landing site. It presented a good example of the tourist board being able to erect breakwaters to create a safe enclosure for the tourist boats against the effects of adverse weather conditions, including cyclones or tsunamis. Whereas adjacent to the landing site occupied by the tourist board, the local fishers and their boats were exposed to the extreme weather. The fishers under a cooperative society, were not able to erect the breakwater structure to protect themselves.

The security of life and property of all citizens, especially of the small-scale fishers, should be the sole responsibility of the government. Therefore, a critical review of the tourist industries on Chilika Lagoon needs to be done to include fair and equal treatment of all operators and should include a scheme that would address some form of compensation to the small-scale fishers and reduce the level of injustice being presently experienced.

### **5.3. Gender Perspective and Coastal Viability considered the issues of forced migrations by fishers from the fishing communities in charge of alternative means of livelihood and the marketing system**

The seasonal and occupational migration of fishers in search of alternative livelihoods forced women to start working to earn an income. Women in fishing communities who otherwise were not allowed to work, fish, or be involved in any form of trading became solely responsible for the upkeep of their families. The women were selling toys and organizing into women's self-help groups to explore some income-generating activities. Women were still not allowed to go fishing and could not buy fish directly from the fishers. However, women occupy the essential marketing node of the value chain despite not being allowed to fish. The women were also denied their rights to purchase caught fish and shrimp directly, except through a middleman or cooperative society. The women, however, have developed instruments for ease of processing fresh shrimps, descaling, and cutting fish. They use ice blocks to cool and preserve their fish and shrimp products. They struggled to break the ice blocks into smaller pieces to increase the area of contact to cool the fish and extend the shelf life of their products. They could be seen struggling on their own to survive, though they had extensive marketing and distribution networks.

### **5.4. Governance was considered from the point of over governance, multilevel governance, weak monitoring, control and surveillance structure and the Nalaban Sanctuary within the Chilika lagoon**

#### ***5.4.1 Over-Governance of the Chilika Lagoon***

There were many competing and conflicting institutions exercising control and authority over different and common aspects of the lagoon. Chilika Lagoon is said to be of importance because of its ecological significance, sensitive ecosystem, socio-cultural system, and varieties of interconnections and complexities. Chilika Lagoon was, however, complicated by the numerous governance structures. It was reported that there were over 52 government organizations exercising control of the Chilika Lagoon, totaling seven state governance organizations, 33 NGOs, three national government ministries, and others (Nayak, 2011). These included the Ministries of Fisheries, Medium and Small Micro Enterprises (MSME), Environment, Tourism, and others such as Forestry, Cooperative, and Revenue. The lack of unified governing support/subsidies led to diminished coastal viability, and fishing practices became less viable while the coast was losing its biodiversity. The lack of regulations has led to more abuse along the fish chains, which in turn affected the ecological landscape of Chilika. A lack of compliance with policies and regulations led to decreasing fish stock, as well as a growing distrust in government. The local small-scale fishers feel the government is inadequately managing the fishing resources, especially by destroying their fishing gear to accommodate aquaculture practices. The continued fishing practices are detrimental to the sustainability of the fish stock, as well as the continued livelihood of the traditional small-scale fishers. The decline in fish stock may indicate overfishing, polluted environment, poor management and unsustainable use of ocean resources. The decrease in the volume of fish caught should have increased the demand, thereby increasing the value of fish; however, this did not occur. This led to the fishers having to change professions or find alternative livelihoods. Better governance could determine what is being practiced on Chilika Lagoon and what would be viable in both the short term and long term (e.g., If you wish to halt fishing practices for X amount of time, a hypothetical solution is subsidizing the time when fishers are now not expected to fish-the practice of closed season).

#### **5.4.2 Multilevel Governance**

The case of the multilateral and multi-level governance structures has created complex dynamics when the primary issues of rights/access/productivity, quality of catch, etc., are considered. It was observed that there were several pockets of communal governance in the lagoon. For example, one of the communities has been exercising community agreements, including using non-monofilament nets and the appropriate gear and protecting aquatic species' breeding areas. According to that community, their efforts have been successful to a large extent in terms of fish production increase and equity in fishing by the respective community. However, this initiative was not aligned with other governing institutions or communities, which eventually led to encroachment by others and exploitation of the resources that the community was protecting. Accordingly, because of a lack of coordination among the governing institutions throughout the lagoon, communities were not able to continue with the intended “good” governance systems. We suggest a bottom-up and interactive governance approach with good coordination among the relevant governing institutions should be practiced to ensure a higher level of justice and equity in the lagoon.

#### **5.4.3 Weak Monitoring, Control, and Surveillance Structure**

It was observed that there was weak monitoring, control, and surveillance of the different activities taking place on the Lagoon. These included but were not limited to illegal, unregulated, unreported fishing (IUU), uncontrolled and non-environmentally friendly aquaculture and shrimp culture practices, destructive ecological interventions, and damaging uncontrolled tourism activities. The minimum level of transparency, accountability, and rule of law was evidence of the lack of justice and equity in the administration of the overall activities in the Chilika Lagoon.

#### **5.4.4 Nalaban Sanctuary**

The Nababan Bird Sanctuary is a unique habitat for fish and birds. The conservation laws are quite strict, and there is evidence that fishers who wandered to the sanctuary deliberately or by mistake for fishing have been arrested. They could be fined up to 25,000 rupees and seven years in jail. The fishing gear of the small-scale fishers was indiscriminately confiscated, and the fishers faced stringent penalties if caught. The lack of adequate awareness of the small-scale fishers to the rules and regulations of the sanctuary presented injustices and a lack of equity. There was no co-governance in the operations within the sanctuary as the Department of Fisheries was not involved in any way in its management by the Navy. The fishers, in avoiding the monitoring and surveillance operations of the navy, use alternative routes that are longer distances to their fishing operations. This presented a case of inequality to small-scale fisheries in its entirety. The impression given was that the government cared more about biodiversity than the fishing communities.

### **6. Conclusions**

The equitable exploitation of fisheries resources, diversification of income options, strong social networks and capacity, adaptation and resilience, and good governance by sharing responsibilities among the relevant stakeholders play a huge role in making SSF viable and representing justice and equity in the context of small-scale fisheries. The unsustainable development and inappropriate responses from the governing bodies have made small-scale fisheries susceptible to different vulnerabilities in the Chilika Lagoon. Our findings show that an imbalance is visible in the social, economic and political dimensions. Small-scale fisheries are continuously exposed to vulnerabilities related to governance, poverty and well-being, access, and equity. The livelihoods, social justice and inclusivity of small-scale fisheries have been missing in the governance responses. The continuous exposure to vulnerabilities, poverty, non-inclusiveness, and social injustices are direct evidence that the small-scale fishing communities have always faced injustice and inequity through neglect and lack of consideration for them in the management of the resources.

Unfortunately, with the advent of global trade and income from shrimp aquaculture and the global economic downturn, the situation of injustice and inequity is getting worse by the day.

The development and blue growth initiatives in the Chilika Lagoon have influenced the social-ecological transitions in different regimes. The social-ecological transition has both positive and negative impacts on the communities around the Lagoon. It seems small-scale fisheries are most negatively affected. It is because the multi-governing bodies failed to operationalize the positive direction of the social-ecological systems to a large extent. Also, the interests of different stakeholders, especially the tendency to aim for high economic growth in the shortest possible time, have negatively affected fisheries resources and had subsequent impacts on the fishing communities, who rely on traditional fishing for their livelihoods and wellbeing. The potential opportunities in the Blue Economy, as identified, may not enhance fisheries co-management within the Chilika Lagoon unless there is a total change in the multi and over governance structure in place. The concept of the Blue Economy in managing all activities within the lagoon to be profitable has introduced strong competition and conflicts to SSF because of the subsistent level of operation, the low income, and the resulting poor economic and political power of the small-scale fishers. These blue economy initiatives demonstrated limited options for the representation of voice and agencies of small-scale fishing communities in Chilika.

It is crucial to find out the ways to make these fishing communities viable from already exposed vulnerabilities. A strategy is also required to avoid the future vulnerabilities of SSFs in the development process. We argue that the vulnerabilities of small-scale fishers in the Chilika Lagoon are not absolute but context-specific, and there is a way out toward viability. The interactions with the small-scale fish farmers after the field trip confirmed our thoughts that 'hope is not lost.' The fishers may have been on the receiving end of bad management and decisions, but it was obvious they had gotten to the point of taking their destinies into their own hands. It is a situation where we are no longer going to fold our hands and see things deteriorate to the point of hopelessness. The fishers were strong, resolute, and determined to change the downward spiral of events that had denied them their rights, privileges, livelihood, homes, family lives, heritage, and life. They want these back but with all their dignity intact. They were open to help and will take the path of equity and justice with all the decency that is demanded of them.

The stakeholders all have a role to play in this. The approach to equity and justice in the management of the Chilika Lagoon will be multidisciplinary, multidimensional, and multiscale and the efforts of all. It is recommended that a commission be established as an umbrella body to coordinate the activities of the autonomous departments and entities currently in charge of the lagoon. A good governance structure of the rule of law, transparency, and stakeholders' participation will ensure that hope is not lost for the small-scale fisheries and fishers on the Chilika Lagoon.

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## References

- Ayilu, R. K., Fabinyi, M., & Barclay, K. (2022). Small-scale fisheries in the blue economy: Review of scholarly papers and multilateral documents. *Ocean & Coastal Management*, 216, 105982. <https://doi.org/10.1016/j.ocecoaman.2021.105982>.
- Baker, D. M., G. Murray, and A. K. Agyare. 2018. Governance and the making and breaking of social-ecological traps. *Ecology and Society* 23(1):38. doi:10.5751/ES-09992-230138.
- Bavinck, M. (2011). The megaengineering of ocean fisheries: A century of expansion and rapidly closing frontiers. In *Engineering earth* (pp. 257-273). Springer, Dordrecht.
- Béné, C., & Neiland, A. (2006). From participation to governance: A critical review of the concepts of governance, co-management and participation, and their implementation in small-scale inland fisheries in developing countries: a review prepared for the Challenge Program on Water and Food. WorldFish Center; CGIAR Challenge Program on Water and Food.
- Bennett, N. J., Blythe, J., White, C. S., & Campero, C. (2021). Blue growth and blue justice: Ten risks and solutions for the ocean economy. *Marine Policy*, 125, 104387. <https://doi.org/10.1016/j.marpol.2020.104387>.
- Berkes, F., & Folke, C. (1998). Linking social and ecological systems for resilience and sustainability. *Linking social and ecological systems: management practices and social mechanisms for building resilience*, 1(4), 4.
- Bjorndal, T., Child, A., & Lem, A. (2014). Value chain dynamics and the small-scale sector: policy recommendations for small-scale fisheries and aquaculture trade. *FAO Fisheries and Aquaculture Technical Paper*, (581), I.
- Blythe, J. L., Gill, D. A., Claudet, J., Bennett, N. J., Gurney, G. G., Baggio, J. A., Ban, N. C., Bernard, M. L., Brun, V., Darling, E. S., Di Franco, A., Epstein, G., Franks, P., Horan, R., Jupiter, S. D., Lau, J., Lazzari, N., Mahajan, S. L., Mangubhai, S., ... Zafra-Calvo, N. (2023). Blue justice: A review of emerging scholarship and resistance movements. *Cambridge Prisms: Coastal Futures*, 1, e15. <https://doi.org/10.1017/cft.2023.4>.
- Briceno-Lagos, N., & Monfort, M. C. (2020). Why use a gender lens to analyse the impacts of COVID-19 on the seafood industry? *SPC Women in Fisheries Bulletin*, 32, 4-6.
- Chuenpagdee, R., & Jentoft, S. (2018). Transforming the governance of small-scale fisheries. *Maritime Studies*, 17(1), 101-115.
- Cinner, J. E. 2011. Social-ecological traps in reef fisheries. *Global Environmental Change* 21(3), 835–839. doi:10.1016/j.gloenvcha.2011.04.012.
- Cole, S. M. C. McDougall, A. M. Kaminski, A. S. Kefi, A. Chilala, and G. Chisule. 2018. Postharvest fish losses and unequal gender relations: Drivers of the social-ecological trap in the Barotse Floodplain fishery, Zambia. *Ecology and Society* 23(2):18. doi:10.5751/ES-09950-230218.
- Deb, A. K., Haque, C. E., & Thompson, S. (2015). ‘Man can’t give birth, woman can’t fish’: gender dynamics in the small-scale fisheries of Bangladesh. *Gender, Place & Culture*, 22(3), 305-324.
- Dias, A.C., Armitage, D.R., Nayak, P.K., Akintola, S.L., Arizi, E.K., Chuenpagdee, R., Kumar Das, B., Diba, S.A., Ghosh, R., Isaacs, M., Islam, G.M., Kane, A., Li, Y., Manase, M.M., Mbaye, A.A., Onyango, P.O., Pattanaik, S., Sall, A., Susilowati, I., Abrokwah, & Singh, S.J. (2023). From vulnerability to viability: A situational analysis of small-scale fisheries in Asia and Africa. *Marine Policy* 155(2):105731. <https://doi.org/10.1016/j.marpol.2023.105731>
- Dujovny, E. (2009). The Deepest Cut: Political Ecology in the Dredging of a New Sea Mouth in Chilika Lake, Orissa, India. *Conservation and Society*, 7(3), 192–204. <https://doi.org/10.4103/0972-4923.64736>.
- El-Hamidi, F. (2011, September). How do women entrepreneurs perform? Empirical evidence from Egypt. In *Economic Research Forum (ERF) Working Paper* (No. 621).
- Enhancement of Adaptation Strategies of Coastal Communities Dependent on Coastal Panaeid Shrimps Fisheries to Impacts of Climate Change and Variability in Coast Region, Tanzania. UNESCO and University of Dar es Salaam; 2011. Report

- FAO. 2022. The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation. Rome, FAO. <https://doi.org/10.4060/cc0461en>
- FAO, Duke University & World Fish. 2023. Illuminating Hidden Harvests – The contributions of small-scale fisheries to sustainable development. Rome. <https://doi.org/10.4060/cc4576en>
- Fitriana, R., & Stacey, N. (2012). The role of women in the fishery sector of Pantar Island, Indonesia. *Asian Fisheries Science Special Issue*, 25, 159-175.
- Galappaththi, M., Armitage, D., & Collins, A. M. (2022). Women's experiences in influencing and shaping small-scale fisheries governance. *Fish and Fisheries*, 23(5), 1099–1120. <https://doi.org/10.1111/faf.12672>.
- Gustavsson, M., Frangoudes, K., Lindström, L., Burgos, M. C. Á., & de la Torre-Castro, M. (2021). Gender and Blue Justice in small-scale fisheries governance. *Marine Policy*, 133, 104743.
- Hendy, A. M. (2015). Gender differences necessities in interior design. *International Design Journal*, 5(3), 1293-1302.
- Heywood, V. (1995). *Global Biodiversity Assessment*. Cambridge University Press.
- Holmes, R., & Jones, N. (2011). Gender inequality, risk and vulnerability in the rural economy. Refocusing the public works agenda to take account of economic and social risks.
- Illuminating Hidden Harvests. (2023). FAO; Duke University; WorldFish ; <https://doi.org/10.4060/cc4576en>.
- ILO. (2013). Sustainable development, decent work, and green jobs. International Labour Office.
- Islam, M. M, and M. M. Hossain. 2017. Community dependency on the ecosystem services from the Sundarbans Mangrove Wetland in Bangladesh. In *Wetland Science*, 301–16. Springer India.
- 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., & Chuenpagdee, R. (2022). Towards a classification of vulnerability of small-scale fisheries. *Environmental Science & Policy*, 134, 1-12.
- Janssen, M. A., & Ostrom, E. (2006). Governing social-ecological systems. *Handbook of computational economics*, 2, 1465-1509.
- Jentoft, S., & Chuenpagdee, R. (2009). Fisheries and coastal governance as a wicked problem. *Marine Policy*, 33(4), 553-560.
- Jentoft, S., & Chuenpagdee, R. (2018). From poverty to well-being in small-scale fisheries: the governability challenge. In *Social well-being and the values of small-scale fisheries* (pp. 293-315). Springer, Cham.
- Jentoft, S., & Chuenpagdee, R. (2022). Interactive learning and governance transformation for securing blue justice for small-scale fisheries. *Administration & Society*, 00953997211073947.
- Jentoft, S., Chuenpagdee, R., Bugeja Said, A., & Isaacs, M. (Eds.). (2022). *Blue Justice: Small-Scale Fisheries in a Sustainable Ocean Economy* (Vol. 26). Springer International Publishing. <https://doi.org/10.1007/978-3-030-89624-9>.
- Koralagama, D., Gupta, J., & Pouw, N. (2017). Inclusive development from a gender perspective in small-scale fisheries. *Current Opinion in Environmental Sustainability*, 24, 1-6.
- Lentisco, A., & Lee, R. U. (2015). A review of women's access to fish in small-scale fisheries. *FAO Fisheries and Aquaculture Circular*, (C1098), I.
- Linke, S., Gillette, M. B., & Jentoft, S. (2022). Institutionalizing injustice? Aligning governance orders in Swedish small-scale fisheries. In *Blue Justice* (pp. 529-547). Springer, Cham.
- Lwenya, C., & Yongo, E. (2012). The fisherman's wife: Vulnerabilities and strategies in the local economy; the case of Lake Victoria, Kenya. *Signs: Journal of Women in Culture and Society*, 37(3), 566-573.
- Lyons, C., Carothers, C., Reedy, K., 2016. Means, meanings, and contexts: a framework for integrating detailed ethnographic data into assessments of fishing community vulnerability. *Mar. Policy* 74, 341–350. <https://doi.org/10.1016/j.marpol.2016.04.022>.

- Medard, M. (2012). Relations between people, relations about things: gendered investment and the case of the Lake Victoria fishery, Tanzania. *Signs: Journal of Women in Culture and Society*, 37(3), 555-566.
- Miah, M. R., Hossain, M. M., & Islam, M. M. (2022). Assessing Sustainability Aspects of Mud Crab (*Scylla* sp.) Fishery and Its Link to Social-Ecological Traps in the Bangladesh Sundarbans. *Coastal Management*, 50(4), 346-371.
- Muzuka N., Bwire K., Shalli M., Kyewalyanga, M., Jacob, G.M., Ibengwe, L.(2011) Nayak, L., Pati, M., & Sharma, S. D. (2016). A Case Study on Aquatic Biodiversity and its Conservation from Chilika Lagoon, Orissa, East Coast of India. *Expert Opinion on Environmental Biology*, 04(01). <https://doi.org/10.4172/2325-9655.1000127>.
- Nayak, P. K. (2014). The Chilika Lagoon Social-Ecological System: An Historical Analysis. *Ecology and Society*, 19(1), art1. <https://doi.org/10.5751/ES-05978-190101>.
- Nayak, P. K. (2022). Making Sense of Multidimensional Injustice for Creating Viable Small-Scale Fisheries in Chilika Lagoon, Bay of Bengal. In *Blue Justice* (pp. 199-212). Springer, Cham.
- Nayak, P.K. (2011). Change and Marginalisation: Livelihoods, Common Institutions and Environmental Justices in Chilika Lagoon. University of Manitoba [https://umanitoba.ca>natuarl\\_resources](https://umanitoba.ca>natuarl_resources).
- Nayak, P. K., & Berkes, F. (2019). Interplay between local and global: Change processes and small-scale fisheries. In *Transdisciplinarity for Small-Scale Fisheries Governance* (pp. 203-220). Springer, Cham.No.: MS/2011/0.
- Ostrom, E. (2009). A general framework for analyzing sustainability of social-ecological systems. *Science*, 325(5939), 419-422.
- Sahu, B. K., Pati, P., & Panigrahy, R. C. (2014). Environmental conditions of Chilika Lake during pre and post hydrological intervention: An overview. *Journal of Coastal Conservation*, 18(3), 285–297. <https://doi.org/10.1007/s11852-014-0318-z>.
- Said, A., & MacMillan, D. (2020). ‘Re-grabbing’ marine resources: a blue degrowth agenda for the resurgence of small-scale fisheries in Malta. *Sustainability Science*, 15(1), 91-102.
- Said, A., Tzanopoulos, J., & MacMillan, D. (2018). The contested commons: the failure of EU fisheries policy and governance in the Mediterranean and the crisis enveloping the small-scale fisheries of Malta. *Frontiers in Marine Science*, 5, 300.
- Kishor C. Samal. “Shrimp Culture in Chilika Lake: Case of Occupational Displacement of Fishermen.” *Economic and Political Weekly*, vol. 37, no. 18, 2002, pp. 1714–18. JSTOR, <http://www.jstor.org/stable/4412064>. Accessed 14 Feb. 2024.
- Santos, A. N. (2015). Fisheries as a way of life: Gendered livelihoods, identities, and perspectives of artisanal fisheries in eastern Brazil. *Marine Policy*, 62, 279-288.
- Satumanatpan, S., & Pollnac, R. (2020). Resilience of small-scale fishers to declining fisheries in the Gulf of Thailand. *Coastal Management*, 48(1), 1-22.
- Schreiber, M. A., Chuenpagdee, R., & Jentoft, S. (2022). Blue Justice and the co-production of hermeneutical resources for small-scale fisheries. *Marine Policy*, 137, 104959.
- Schutter, M. S., Hicks, C. C., Phelps, J., & Waterton, C. (2021). The blue economy as a boundary object for hegemony across scales. *Marine Policy*, 132, 104673. <https://doi.org/10.1016/j.marpol.2021.104673>.
- Sharma, K., Gulati, R., Singh, S., & Bamel, K. (2022). A Paradigm: For Quantifying the Value of Women’s Efforts in Small-Scale Fishing.
- Silver, J. J., Gray, N. J., Campbell, L. M., Fairbanks, L. W., & Gruby, R. L. (2015). Blue Economy and Competing Discourses in International Oceans Governance. *The Journal of Environment & Development*, 24(2), 135–160. <https://doi.org/10.1177/1070496515580797>.
- Sowman, M., & Raemaekers, S. (2018). Socio-ecological vulnerability assessment in coastal communities in the BCLME region. *Journal of Marine Systems*, 188, 160-171.
- the Gulf of Thailand. *Coastal Management*, 48(1), 1-22.

Thorpe, A., Pouw, N., Baio, A., Sandi, R., Ndomahina, E. T., & Lebbie, T. (2014). "Fishing na everybody business": Women's work and gender relations in Sierra Leone's fisheries. *Feminist Economics*, 20(3), 53-77.

Wikipedia.<https://en.m.wikipedia.org/wiki>

World Bank (2017) What is Blue Economy? [https://www.worldbank.org/en/news/infographic/2017/06/06/blue\\_economy](https://www.worldbank.org/en/news/infographic/2017/06/06/blue_economy).

Zelasney, J., Ford, A., Westlund, L., Ward, A. and Riego Peñarubia, O. eds. (2020). Securing sustainable small-scale fisheries: Showcasing applied practices in value chains, post-harvest operations, and trade. FAO Fisheries and Aquaculture Technical Paper No. 652. Rome, FAO. <https://doi.org/10.4060/ca8402en>.





## 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 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](http://www.v2vglobalpartnership.org).

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