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Reflections from the Chilika - V2V Field School: Blue Justice and Social-Ecological System Challenges in the Chilika Lagoon, India

V2V Working Paper No. 2025-03

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July 2025

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How to cite:
Mbhele, S., Alam, S., Korang, R., Thengal, G., Musthafa, M., Agyapong, P. J. A., Mpendu, Z. S., Samanta, N., Adikari, D. and Nyiawung, R. A. (2025). *Reflections from the Chilika - V2V Field School: Blue Justice and Social-Ecological System Challenges in the Chilika Lagoon, India.* V2V Working Paper 2025-03. V2V Global Partnership, University of Waterloo, Canada.

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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.

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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1. Introduction

Coastal communities in India and around the world are under stress and facing uncertainty from myriad sources, including changes in demographics, climate change, and natural disasters (Rabbani et al., 2010; Umamaheswari et al., 2021; Das et al., 2022; Shukla et al., 2022). From increasing fish demand, conservation efforts, and development of coastal resources and infrastructure, people and governments are looking into the coast/marine environment to produce more for society through different interventions (Cohen et al., 2019; Ayilu et al., 2022). However, there are several contestations, including changes in policies and resource management practices, that often result in conflict and marginalization of people in coastal communities (Cohen et al., 2019; Schreiber et al., 2022; Das, 2023). As to who benefits or who bears the burden when changes occur in coastal communities remains a question for exploration.

This paper draws on reflections from a diverse group of early-career scholars ("Team Blue Justice") who attended the Krushna Chandra Jena Chilika - V2V Annual Summer Field School, 2024, in Chilika, India. The Blue Justice team specifically focused on identifying through field observation and discussions with community members and leaders what they consider some of the social-ecological challenges, marginalization, and injustices occurring around the Chilika Lagoon area. The Chilika Lagoon is a unique and important social-ecological system in India that has undergone significant changes, and resource grabbing, which has resulted in the marginalization of small-scale fishing communities (Nayak, 2022). Two significant irreversible and large-scale changes have occurred in the Chilika Lagoon, these are:- expansion in aquaculture (shrimp) development in the Lagoon and the opening of a new sea mouth through natural and human-influenced activities (Nayak, 2014). These changes have resulted in the loss of resource access rights, local institutions, and the ecological displacement of people who have lived and depend on the lagoon for various social and economic reasons (Nayak & Berkes, 2010). These changes have impacted social, economic, political, and environmental aspects of fishers' lives, leading to livelihood crises and out-migration (Nayak, 2012).

As we present in this paper, there are numerous injustices and marginalizations of small-scale fisheries actors happening within the Chilika Lagoon, with some commonalities related to other small-scale fishing communities in India and beyond. We draw on the "blue justice" language as an interactive heuristic

approach to categorize our reflection on the different forms and drivers of conflicts, justice, and marginalization happening in the Chilika Lagoon.

In the next section, we provide a background on the history of Chilika Lagoon and the different social-ecological changes, followed by a bird-eye view of the definitions and literature on the Blue Justice concept. We then report on the different aspects of blue justice using different themes, including broader discussions on the growing challenges within coastal communities, which many argue may become even more prevalent due to increasing pressure on the lagoon. The paper draws its insights from the reflections of experiential learning and limited observations by the team of field school participants.

2. The learning context of Chilika Lagoon

The Chilika Lagoon is Asia's largest brackish water body and has a rich history spanning over 5,000 years (Ghosh, 2003). Located on India's eastern coast, it fluctuates in size seasonally, ranging from 906 to 1,165 km² (Ghosh, 2006). The lagoon's diverse habitats include deltaic flats, brackish marshes, and islands (Paul et al., 2014) and have attracted the settlement of several people and communities (See Figure 1). The lagoon is renowned for its rich biodiversity, attracting migratory birds from distant lands. However, changes in hydrodynamics have led to the formation of sand bars and altered sedimentation patterns, causing a decline in maritime activities (Tripati & Vora, 2005), but the lagoon continues to support local livelihoods through fishing, livestock rearing, and ecotourism (Paul et al., 2014).

Figure 1

Map of Chilika Lagoon and the different field sites visited

2.1 History and Ecological Significance of Chilika Lagoon

The Chilika Lagoon, historically, has been recognized as a rich base, a status it maintained until the late 1970s (Nayak & Berkes, 2011). Both oral traditions and documented evidence suggest that the lagoon's ecosystem thrived due to its unique interaction with the Bay of Bengal, facilitated by a naturally occurring sea mouth and the inflow from 52 rivers and rivulets that provided a steady supply of freshwater. This intricate balance of environmental factors— such as water depth, salinity, and flow rate— supported a highly productive ecosystem, and nurtured diverse types of flora and fauna (Nayak & Berkes, 2011).

The lagoon's history reveals complex interactions between social, ecological, economic, and political components, shaping its trajectory and system characteristics (Nayak, 2014). The lagoon's ecological history highlights the critical role of a healthy and thriving ecosystem in providing for the shared use and management of resources among local communities (Nayak & Berkes, 2011). The lagoon's diverse ecosystem supports numerous migratory bird species and holds cultural and religious importance for local communities (Ghosh, 2003). Over time, however, shifts in ecological and social conditions, alongside increased human intervention, have led to significant changes in the lagoon's resource dynamics. These changes not only impacted the biodiversity of Chilika but also the livelihoods and cultural practices of the communities dependent on it.

In terms of ecological significance, the Chilika Lagoon, which has been designated as a Ramsar Site of international conservation significance. It is a biodiversity hotspot connected to the Bay of Bengal on the south, with the Eastern Ghats Mountain ranges forming most of its catchment on the north and west (Nayak, 2014). This lagoon is the most significant wintering ground for migratory waterfowl on the Indian subcontinent and is home to the endangered Irrawaddy dolphins (Orcaella brevirostris) (Nayak, 2014). Supporting over 350 species of nonaquatic plants, along with diverse phytoplankton, algae, and aquatic plants (Nayak & Berkes, 2011), the lagoon provides a habitat for several rare, vulnerable, and endangered species listed on the IUCN Red List.

2.2 Fishing Practices in Chilika Lagoon: Historical and Contemporary Perspectives

Historically, the fishing practices within Chilika Lagoon were deeply connected with the seasonality of different fish species (Nayak, 2014). These fishing practices were meticulously adapted to specific locations within the lagoon, with different fishing castes employing distinct gears and methods based on customary practices. Each caste had designated areas for fishing, with collective rules on what to catch, where, when, and by whom.

The lagoon's rich resource base, sustained by its interaction with the Bay of Bengal and the inflow of freshwater from 52 rivers and rivulets, supported this traditional system (Nayak, 2014). The dynamic interplay of water depth, salinity, and flow contributed to a productive ecosystem that enabled diverse fishing practices tailored to the lagoon's ecological conditions. However, the landscape of fishing practices in Chilika Lagoon began to shift significantly with the onset of the 1970s. A surge in global demand for fish, in addition to a decline in capture fishery yields, placed aquaculture at the forefront of the fishing industry (Galappathi & Nayak, 2017).

The burgeoning international market for shrimp and prawns, particularly in North America, Europe, and Japan, drove up prices and transformed prawns into a highly valuable commodity, often referred to as "pink gold" (Nayak & Berkes, 2011). As a result, non-fishers, often baked by influential individuals, began to invest heavily in aquaculture, primarily for prawn production. This led to the conversion of traditional fishing grounds into prawn ponds, disrupting the established fishing practices of the caste-based fishers. By the late 1980s, a pattern of encroachment emerged, with the lagoon's resources increasingly controlled by non- fishers and what locals referred to as the "Chingudi mafia" (prawn Mafia) (Nayak & Berkes, 2011).

This shift precipitated severe conflicts between traditional fishers and the new aquaculture operators, disrupting the socio-economic and ecological balance within Chilika Lagoon.

2.3 Social-Ecological Changes and Major Drivers

Chilika Lagoon has historically supported the small-scale fisheries of the fisher communities. However, these resources have been diminishing over the past few years. The decline is attributed to changes in the lagoon's ecosystem and the impact of human activities. Several drivers have contributed to social-ecological changes in Chilika, influencing its history. Two major drivers of these changes are aquaculture development and the opening of a new sea mouth in 2001 (Nayak & Berkes, 2010), which resulted in the marginalization of small-scale fishing communities, impacting their livelihood, social structures, and connection to the environment (Nayak, 2012). It has also led to the loss of resource access rights, the decline of local institutions, and ecological displacement, of the SSFs (Nayak & Berkes, 2010).

(i) Impact of Shrimp Aquaculture
The international market for shrimp and prawns initially developed in the 1970s, and in India, its commercialization and scientific farming started in the 1980s (Nayak, 2014). Prawns in India, once considered of little worth, transformed into "pink gold" (Pattnaik & Shekhawat, 2020). The growth of shrimp aquaculture in the 1980s raised questions about access, usage rights, and changes in the lagoon fish economy (Nayak, 2014). The 1991 policy legalized shrimp aquaculture in Chilika and allowed non-fisher caste villages to engage in it, causing its spread throughout the lagoon (Nayak & Berkes 2010). Soon shrimp aquaculture became a major driver of change there.

(ii) Creation of Sea mouth
Most of Chilika's sea mouths had closed down naturally by the twentieth century. Only a single sea mouth was functional (Mishra et al., 2022), but not sufficiently functional to facilitate the flushing of sediments and silt from the lagoon into the Bay of Bengal, resulting in the need for a new one, which was dredged in 2001. The new sea mouth, however, allowed in too much seawater, which had inadvertent ecological and livelihood impacts (Nayak & Berkes 2010). The changes in biophysical processes caused fish production to deteriorate, affecting the associated livelihoods.

3. The learning Frame

3.1. Blue Justice as a conceptual lens

The concept of Blue Justice was coined by Moenieba Isaacs in 2018 during the World Small-Scale Fishers Congress (Jentoft, et al, 2022; Blythe, 2023). In this engagement, Isaacs argued that the concept of blue justice contests the oceans, lakes, and protected area spaces and seeks to create an enabling environment where small-scale fishers are not marginalized and excluded by the developments of blue economy initiatives around the globe. The concept of blue justice is situated in the social justice agenda for small-scale fishers and calls for inclusivity in the era of blue economy (Isaacs, 2019). It looks at ocean governance and small-scale fisheries in the era of blue economy and relational, multi-dimensional and material in the ways in which it looks at marginalized groups and those who bear the brunt of the injustices of development of the ocean through blue growth initiatives. It recognises that decisions are not for the state alone to take, hence the call for inclusivity and the prioritisation and protection of small-scale fishers and their livelihoods (Blythe, 2023; Jentoft, 2022). Blue justice gives a narrative founded in practice; lived experiences of those who experience injustices as part of their history and daily lives, which is what this paper seeks to do using the experiences of the people who surround the Chilika lagoon. It looks at how the benefit as well as burden on blue economy and blue growth initiatives is distributed in the context of the Chilika Lagoon.

In this reflection paper, we use the term blue justice as a heuristic language to provide an observer account and discussion with community members on the various marginalization and injustices happening within the Chilika Lagoon, including social and ecological threats. Among many scholars, the different contentions for coastal resources management and use, especially within small-scale fishery-dependent communities, are broadly conceptualized as "blue justice" (Gustavsson et al., 2021; Blyth et al., 2023). While the definition of blue justice remains a puzzle, Jentoft and colleagues (2022) characterize blue justice in terms of three governance meta-orders. The first order relates to the power dynamic and interactions among stakeholders within the SES system, i.e., how different kinds of actions either marginalize or support the way actors interact and behave with each other. The second order focuses on the different institutional characteristics and governance arrangements that define how rules are made, who is in charge, and who does what. Lastly, the third order speaks to the different norms and principles that are in place, recognizing rights and inclusion, especially for marginalized actors.

While the three governance orders provide a foundation for understanding blue justice, it is important to understand the different sources of injustices and marginalization of actors, even in places with better institutional arrangements. For example, there are several instances where the development and exploitation of coastal, ocean, and marine resources, i.e., blue growth activities, often impact dependent communities negatively (Bennett et al., 2021). Further, acknowledging the different forms of actors' interactions and activities within the blue space, the international Too Big to Ignore (TBTI) network, outlines different forms of injustices facing small-scale fisheries around the world. These include distributive, social, economic, market, regulatory, infrastructure, environmental, and procedural elements of blue justice. In this reflection paper, we use these different elements of justice to discuss key themes that emerged from our observations and discussions with community members. We provide meaning and definitions to the different kinds of injustices we encountered during our field visits.

3.2. The learning process

This paper is based on field observations and discussions by the "Blue Justice Team" with community members during the Krushna Chandra Jena Chilika - V2V Annual Summer Field School, 2024, in Chilika, India. Our group consisted of 11 members from diverse backgrounds. To effectively collect information for our reflection paper, we divided into smaller teams of 2-3 people, allowing us to focus on specific tasks and observations. Most group members employed documentation and observation methods, relying on field notes and visual cues to gather information.

Since a few members of our team were fluent in Hindi and Bangla, this enabled us to conduct interviews and gather relevant information from local stakeholders by engaging with discussions in Hindi or Bangal. Additionally, a deeper understanding of the Chilika Lagoon's context, history, and current situation was provided by the V2V summer school facilitators and faculties. Moreover, we also conducted a scoping literature search on previous research and documentation to enhance our understanding of the social and ecological complexities within the Chilika Lagoon in the context of Blue Justice. To overcome the language barrier, we used Google Translate to convert our questions from English to Odia to effectively communicate with local people who spoke neither Hindi nor Bangla.

Lastly, the group gathered, discussed, and shared their observations with the entire team. This discussion session allowed us to share insights, reflect on our observations, and collectively identify emerging themes. Through this group work, we collectively organized our observations, including comments/feedback from presentations to the broader audience of the V2V summer school. We collectively organized our findings into four key themes: (1) people-cantered vs fortress conservation challenges, (2) commons contestation and justice, (3) infrastructure, (4) value chain dynamics, (5) social-cultural dynamics structure, and (6) Tourism.

4. Reflections on Blue Justice issues in Chilika Lagoon

4.1 Community and conservation dynamics

Conservation activities in and around the Chilika Lagoon remain a problematic issue, especially between the people and local authorities, partially linked to the different conservation approaches and the meaning of protected and non-protected areas. Here, we make specific reference to the Mangalajodi Conservation Area and the Nalabana Bird Sanctuary, Chilika as potential sources of marginalization and injustices within the Lagoon. The Nalabana Bird Sanctuary was founded in the 1980s with the discovery of the rich bird species that visit the Chilika landscapes. The area was declared a protected area which has been under the management of the Indian government through the Forest Department of the Government of Odisha and the Chilika Development Authority.

The method of conservation in this protected area is the common mainstream conservation approach which is primarily based on fences and fines, creating clear dichotomies between people and nature as well as limiting access to these natural spaces through restrictions and consequences of entry. (Hansen, 2015; Masse, 2015) This is evident in the bird sanctuary through the fencing poles on the entire water space territory, which falls under the management of the forest department. Additionally, consequences of trespassed entry into the Chilika bird sanctuary include 3-6 years of arrest or 10,000 rupees if fined. These are clear messages to the fishing communities of the Chilika Lagoon, who have once used these water spaces as their fishing grounds, to not enter. Additionally, these deem their entry for livelihood purposes to be a possible criminal offense. This has consequently created tensions between communities and the conservation area, with 7 arrests reported in the past 7 months "since the beginning of 2024." The restrictions and consequences on access to water spaces in the Chilika lagoon have led to the criminalization of the livelihood of small-scale fishers along the Chilika lagoon, restricting those who have always used the water spaces as their fishing grounds and preventing their ability to supply fish and provide for families across the lagoon.

These policies and regulations, usually founded without the consultation of ordinary community people. While the government benefits from tourism conducted on this site through entry fees, communities are left out of key decision-making processes leading to the case of exclusion.

Figure 2

The left picture shows poles and signage on the entry of the Chilika Lagoon, and the Right picture shows rangers from the Chilika Bird Sanctuary

Source: Siphesihle Mbhele & Prince Joseph, 2024

Next, the Mangalajodi Conservation Area/Bird Sanctuary was established in the 1990s, with the community being at the center of the establishment of this conservation area. Over and above livelihood activities, the landscape has historical and cultural significance for communities that live near it. The Mangalajodi landscapes were previously used by communities as hunting grounds for a special bird species that habituated these water spaces; the reason for the hunting of these birds was local belief concerning the nutritional benefits of eating the birds, particularly for pregnant women. The story of conservation has therefore been successful since its inception, with less tension between the community and the conservation authority. This is because, upon the founding of the park, the conservation officials worked with the community to follow due cultural processes, including visiting the temple to plead for peace on this particular landscape and establishing a cultural agreement that saw the community being part of the day-to-day running of the conservation area and gaining more knowledge on the bird species habituating these landscapes. On the south of the Chilika Lagoon, the Chilika Lagoon also demonstrates interest in conservation by starting a community turtle conservation initiative, led by community individuals who are fishermen. This initiative has over a decade of existence and has proven to be a success story for its organisers and continues to be a community-led initiative.

These experiences showcase a successful conservation model that integrates people with nature, recognizing communities as part of the landscapes that sustain their livelihoods. This brings us to the question of whether more culturally considerate models of conservation could be the future of conservation that ensures the biodiversity conservation without displacing community livelihoods. The use of the landscapes as routes to the Chilika Lagoon as well as fish landing grounds by the community are important elements for consideration in looking at simple acts of co-operation by conservation authorities and communities. This a classic example of balancing the needs of communities with those of conservation. Ensuring that communities have access to their livelihoods while also having them participate as active agents in the conservation of natural resources.

Cultural considerations are important in the conservation discourse. Most of the landscapes that are used for conservation purposes, including that of the Mangalajodi community, are spiritual and cultural landscapes with high value for communities, conducting a culturally appropriate approach to conservation means learning from the community, seeking guidance and knowledge from the custodians of the land and following due cultural diligence. (Kiwango & Mabele 2022; Sowman & Sunde, 2014). Key justice elements in both cases, crucial for progressive conservation efforts, include involving communities in shaping conservation and management actions. This helps address tensions arising from the lack of procedural and regulatory justice, as seen in the bird sanctuary case in Central Chilika Lagoon, where excluding communities from the conservation initiative led to social injustices and even criminalisation of fishing.

Connecting Conservation Practices to Blue Justice in Chilika Lagoon

There are observable connections between conservation approaches and blue justice issues in Chilika Lagoon. As people and government explore the Lagoon for development and different socioeconomic interests, conflicts are inevitable. Here we sought to understand how these different conservation practices affect communities that depend on the lagoon for various purposes. Recognising the importance of the blue justice framing in conservation involves ensuring the rights of local communities to access and use the lagoon's resources are upheld to address past injustices effectively. (Isaacs, 2019; Blythe, 2023). Blue Justice considerations also provide for realising benefits of learning from communities who have, from generation to generation, passed down lessons on how to ensure the sustainability of the fishing resource to this day. (TNI Agrarian Justice Program et al, 2014) This includes exploring questions on how authorities can ensure fair distribution of benefits, inclusive decision-making, and recognition of rights. This forwards the thinking to the extent of considering whether there should be community economic benefits from conservation initiatives, such as eco-tourism. Implementing a Blue Justice strategy can enhance the effectiveness and sustainability of conservation activities in Chilika. It guarantees that local communities

are not just recipients of conservation efforts, in some cases leading to criminalization and raised tensions between communities and authorities, but rather engaged participants and collaborators in the management and protection of natural resources. (Peer, 20202; Margaryan, 2017) Consequently, this can promote a heightened sense of ownership and accountability towards the environment of the lagoon and more involvement of the community as active stakeholders.

From our observation, the villages surrounding Nalabana Sanctuary and Mangalajodi have experienced a profound transformation, transitioning their means of making a living from traditional fishing to eco-tourism. Community adaptability and resilience is built through enhanced awareness on the ecosystem, birds and livelihoods options through conservation efforts rather than only depending on fishing, which is challenged with steady decline in catch per unit efforts (CPUE). Former migratory bird poachers, previously fishers have become tourist guides driven by an understanding of the need for conservation through eco-tourism and the imperative of respecting the sanctuary norms and rules. Community members have enthusiastically engaged in conservation endeavours, including wildlife surveillance, anti-poaching patrols, and ecotourism administration. This engagement has enabled community members to assume the role of caretakers for their surroundings.

In this context, Environmental justice entails not only environmental protection but also an equitable distribution of benefits and burdens. The community's endorsement of conservation arises from recognizing that a robust ecosystem is necessary for their enduring prosperity. Nevertheless, obstacles continue to exist. Not all community members have experienced a smooth transition to eco-tourism. Individuals lacking financial resources or expertise may have encountered challenges in fully engaging in the new economy.

Inclusion, benefits, and livelihood impacts caused by conservation practices

The effectiveness of conservation initiatives in the Chilika Lagoon relies on the active engagement of the local communities. The traditional knowledge and practices of these communities are extremely critical to inform management decisions. Hence, it is crucial to incorporate them into the decision-making process. Establishing community-based organizations (CBOs) can enable local individuals to actively engage in conservation efforts, thereby enhancing their empowerment. These Community-Based Organisations (CBOs) can function as forums for exchanging information, recognizing the community's requirements, and cooperating with government agencies and non-governmental organizations (NGOs), as exemplified by the situation in Purunabandha. (Rahman et al, 2017; Hara, 2009). Community members engaged in participatory mapping to chart their community using the coastal commons map. This method facilitates mutual learning among community members. It is crucial to establish inclusive decision-making processes to guarantee that every community member has the opportunity to contribute to the development of conservation projects. This involves creating forums for under-represented communities to voice their problems and ambitions. (Inoue, et al, 2023; Hara, 2009).

The conservation measures implemented in the Chilika Lagoon, while necessary for ecological balance, have had a significant impact on the livelihoods of local communities. Restrictions on fishing practices and the establishment of protected areas have affected the income of fisherfolk. While these measures are crucial for the lagoon's health, it is essential to find ways to mitigate the negative impacts on local communities. This shift towards eco-tourism has had a profound impact on the livelihoods of the community. While it has created new income opportunities, it has also led to certain trade-offs. Some fishermen have found it difficult to completely abandon their traditional occupation, leading to a period of economic uncertainty. Moreover, the seasonality of tourism has created income fluctuations. The community has started exploring opportunities in agriculture, handicrafts, and homestays. Could providing financial support, such as compensation or alternative employment opportunities, help cushion the impact of conservation measures?

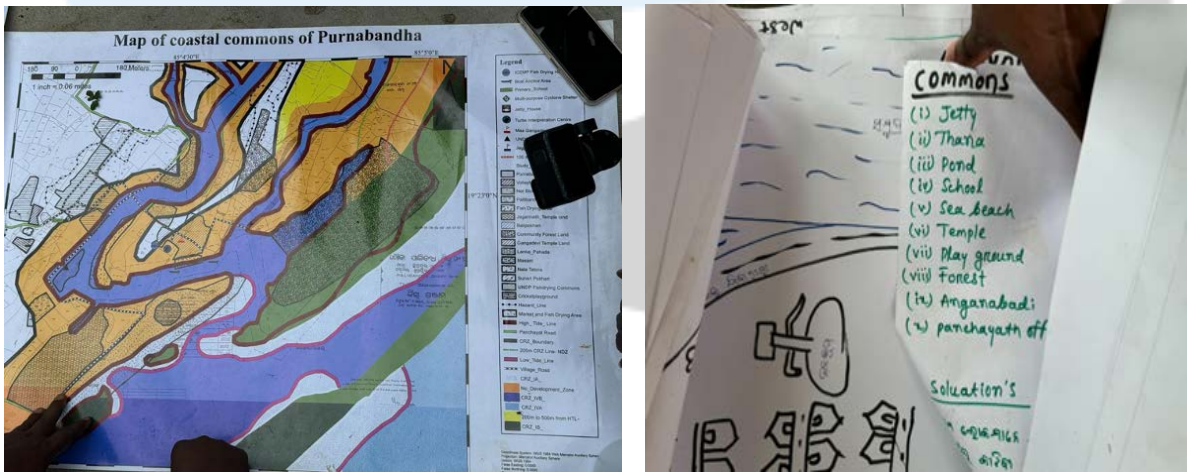
While it is crucial to prioritize conservation efforts, it is equally imperative to guarantee that the advantages of these initiatives are distributed fairly among all members of the community (Isaacs, 2019) This encompasses equitable allocation of income earned from eco-tourism, availability of enhanced infrastructure, and prospects for capacity building. It is imperative to prevent a scenario in which conservation efforts disproportionately benefit only a select few persons or groups, while the mass of the community remains in hardship. Adopting a fair and impartial approach will cultivate a feeling of possession and accountability for preserving the lagoon.

4.2 Commons contestations and justice

Fishing communities along the Chilika Lagoon experience various challenges and pressures emanating from conservation, industrial and infrastructure development interests. As discussed above, establishment of protected area has brought in certain changes in the governance of lagoon as commons. Further, the visit to Purunabandha, a fishing village in the south of Chilika Lagoon paints another image of conflict. The communities in around Purunabanda village depend on the lake for different livelihoods including fishing, farming and operating salt pans. This community has a unique history of resisting industrial and government pressures on encroachment of community land. They have also been subjected to repeated challenges caused by improper government decisions. The systematic erosion of salt pans was observed in the area due to several anthropological interventions both in the Chilika Lagoon and in the feeding channels. It has also been observed that the implementation of CRZ policy is patchy and non-inclusive The Coastal Regulation Zone (CRZ) regulation was established in India to manage and protect the nation's coastal regions. Since its inception in 1991, the CRZ regulations have seen four significant revisions, in 2011, which introduced crucial changes regarding development activities in coastal areas. This policy made provisions that no development or industrialization should take place in certain parts of the coast. These were termed (No Development Zones). The reasons for this regard are ecological factors, which include ensuring the preservation of rich ecological landscapes. However, the current mapping of no development zones left out communities who are based in these areas therefore leaving them vulnerable to future influence and dispossession by capital for development processes which would not be a first experience for the Ganjam community as this has been experienced in earlier years.

Figure 3

Picture showing the map developed by the community, including key common resources and the common resources mapped by the Ganjam community



Source: Siphesihle Mbhele, 2024

The Purnabadha village, on their own collectively have collectively undertaken the village resource mapping exercise with clear outlining of their commons along with other geographical elements of the village including habitation. The map provides visual depiction and positioning of agricultural land, fishing grounds, schools, homesteads, hospitals, temples, and clinics. This mapping process has created a sense of collective ownership over village resources and strengthen their resolve to fight against external interests in case of encroachment, occupation or externally induced land-use change. This case was provided for learning and reflection, encouraging an exploration of whether participatory mapping can be used to address injustice, prevent future conflicts, and protect community livelihoods from potential impacts. The experience also suggests about the community measures, that can help create evidence and tools for fighting possible threats caused by external actors.

In the villages of Purnabanndha and Ganjam, distinct socioeconomic dynamics influence community life. Despite both villages sharing similar communal resources, their approaches to these resources diverge significantly. For instance, one village has actively engaged in turtle conservation efforts, showcasing a strong commitment to environmental preservation. The documentation of conservation practices within these commons has emerged as a powerful tool for both resistance and recognition, reflecting the community's dedication to ecological stewardship. Local traditional knowledge significantly enhances the documentation process in these villages. This knowledge encompasses the community's historical, ecological, and social understanding of their commons, enabling a richer, context-aware documentation process (Chambers, 1994; Berkes, 1999). In the visits, we then considered whether or not community engagement in protection and conservation efforts is vital, to effectively safeguard their commons.

4.3 Infrastructural Challenges

Blue Justice pertains to the fair distribution of environmental and social benefits within aquatic ecosystems, ensuring the inclusion of marginalized communities, such as fishers, in decision-making processes. At the heart of Blue Justice is blue infrastructure, which encompasses both natural and engineered systems designed to manage water resources while fostering environmental sustainability and community well-being (Bell et al., 2021). In the unique context of the Chilika Lagoon, a brackish water ecosystem, implementing regulated blue infrastructure is critical for maintaining ecological equilibrium and promoting social equity. The infrastructure development mostly in four critical areas in aound Chilika including market, water supply, housing and artificial sea mouth is observed through a blue justice lens.

Market: Economic and Social Inequities

The market in Chilika Lagoon serves as the most important value chain infrastructures for local fishers. The lack of adequate number of permanent concrete sheds in Balgaon fish markets poses challenges in business operations, particularly affecting marginalized groups, such as women and low-income fishers. Additionally, gender dynamics and power disparities further distort market functioning, granting certain individuals undue influence over pricing and resource allocation. These conditions underscore the urgent need for more inclusive and community-cantered market infrastructure that promotes economic justice and resilience, especially in the wake of natural disasters.

Water Facility: Inequality in Access and Health Impacts

Chilika's water infrastructure exhibits significant inadequacies, particularly in supply, drainage, and sanitation (Nair et al., 2023). The lack of access to clean water disproportionately impacts marginalized communities, exacerbating health conditions and limiting access to basic needs. Poor drainage systems contribute to water contamination, heightening the risk of waterborne diseases. At the same time, inadequate sanitation further compounds public health challenges (Nair et al., 2023). These deficiencies

highlight the critical need for improved water management systems that ensure equitable access and bolster community health.

Figure 4

Well water is being shared by the whole community, Barkul Village, and the picture shows inadequate infrastructure available to women in the Balugaon Fishing Market

Source: Mustafa, 2024

Housing: Inequitable Distribution Post-Disaster

Housing infrastructure in Chilika has been characterized by unequal distribution, particularly following natural disasters like cyclones. There are implementation deficiencies in government housing schemes which lead to the exclusion of most deserving people therefore making them unable to receive any sort of relief and assistance. Such implementation inadequacies deepen existing social and economic inequalities, eroding community trust in governance and recovery efforts. To address housing inequality, transparency in the allocation process is essential, prioritizing the most vulnerable in post-disaster rebuilding efforts. This approach aligns with Blue Justice's commitment to fair resource distribution and the protection of marginalized groups.

Artificial Sea Mouth: Environmental and Procedural Injustice

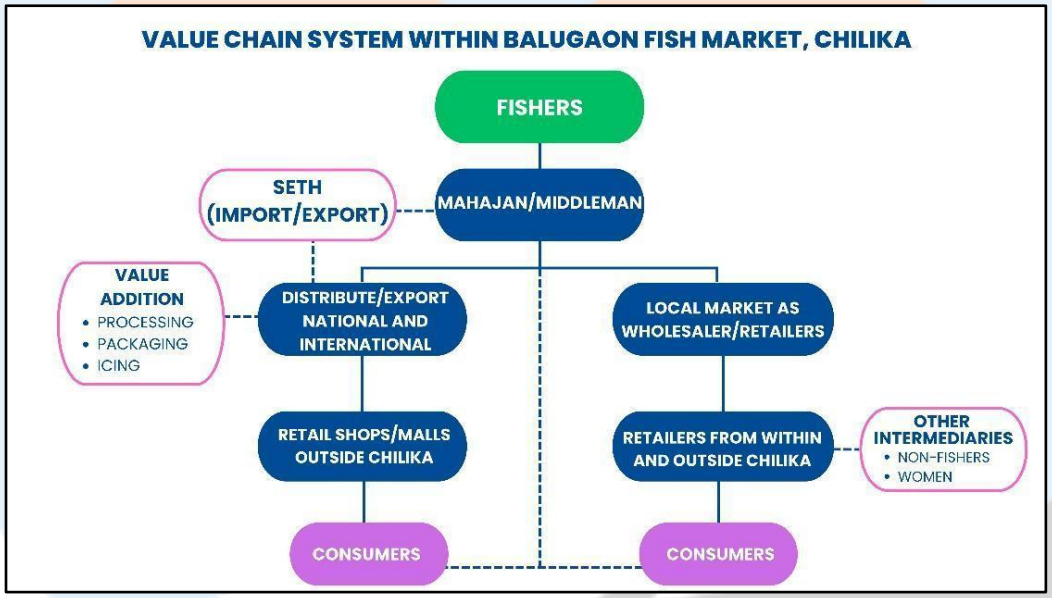
The creation of the artificial sea mouth in Chilika Lagoon exemplifies procedural injustice. The local community was not consulted during the planning and implementation phases, leading to significant environmental alterations that adversely affected local livelihoods. Changes in water currents, the introduction of invasive species, and a decline in freshwater fish populations have disrupted the lagoon's ecosystem, diminishing vital resources for fishers. Additionally, land erosion resulting from the sea mouth's relocation threatens the land and resources of the fishing community. This top-down decision-making process disregards the knowledge and priorities of the local population, undermining both ecological stability and social equity. Moving forward, increased community involvement in environmental decision-making is essential to ensure that development projects adhere to the principles of Blue Justice.

4.4 Value Chain Dynamic in Balugaon Fish Market

A value chain is defined as the range of activities that are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers and final disposal after use (Pradhan et al,2022) According to Ahmed (2007), the value chain is a structure of physical, economic, and social transactions between individuals and organizations engaged in raw material transformation into end products. The fish value chain describes a model of how fishery businesses receive raw materials as input (i.e., fish caught), add value through various processes, and sell finished products to customers in the marketplace (Ovando et al., 2016; Avadi et al., 2014). In the context of the Balugaon fish market in Chilika, five main value-chain actors (fishers, wholesalers, retailers, processors, and end-users/consumers) were identified (See Figure 5). The' Mahajans' middlemen, who act as wholesalers and retailers, play a significant role in the fish value chain in Chilika. They are involved in collecting (buying), supplying, value-addition, marketing, and consuming. These dynamic value chain structures show the complexity of the fish trade, where traditional roles blend with evolving markets, impacting the livelihoods of various value chain actors.

Figure 5

Structure of the Value Chain



The different value chains observed in the Balugaon market in Chilika are as follows:

1. Fishers → Customers
2. Fishers → Mahajan (acting as wholesalers/retailers) → Customers
3. Fishers → Mahajan → Small Women Retailers (local/outside) → Door-to-Door Vending → Customers
4. Fishers → Mahajan → local/outside non-Fishers (further retailing in villages) → Customers
5. Fishers → Seth (importers from other states) →Retailers→ Customers
6. Fishers → Mahajan (processing with ice and packaging) → Export Outside the Market → Customers

Power Dynamics, Challenges, and Opportunities for Actors in the Value Chain

Across various value chains observed, the middlemen known as Mahajans hold the key, often controlling the prices, and terms of trade. Mahajans are traditionally moneylenders or middlemen in the fish market who financially support fishers, traders, and other small players in the fishery value chain. Mahajans often advance loans or credit to fishers for buying fishing gear, and boats, or for meeting daily expenses. In return, they secure the right to take the fish catch directly from the fishers as repayment for the loan. This arrangement ensures a steady supply of fish to the Mahajans, who then supply to other value chain actors, including wholesalers, retailers and sometimes directly to consumers. This relationship can be both beneficial, providing necessary financial support, and exploitative, leading to economic dependency and limited bargaining power for fishers. The system has persisted over the years, evolved with changes in the local economy and market dynamics. Mahajans—both from traditional fishing and non-fishing communities operate without conflict over market access. Often fish markets are run by fishing cooperatives who work together to determine market entry and manage affairs between fishers to ensure smooth trading processes.

The extant market interactions limit the fishers to access high value markets. Higher dependency on Mahajans also limit the bargaining power of fishers and cause unequal distribution of market returns. Improving access for fishers and small traders could involve creating more direct market channels by reducing the monopolistic influence of certain intermediaries. In Balugaon fish market, competition among Mahajans is evident during the sale of fish catches. Customers frequently negotiate for better prices, which prompts Mahajans to compete with each other to secure sales. There are opportunities for collaboration, such as joint marketing efforts, which might help balance competition, potentially benefiting all market participants. Privatizing the marketplace and infrastructure has led to each trader paying a private entity for access. This arrangement has made small-scale fishers (SSF) face difficulties accessing the market value chain directly and potentially reducing their market opportunities and bargaining power. Strategies could be adopted to improve equitable market access for small-scale fishers, including women vendors in a privatized marketplace. The fish value chain is vulnerable to external shocks such as overfishing, destructive fishing, climate change, policy shifts, and pandemics that affect supply and demand. There might be ways to address these challenges, such as promoting sustainable fishing practices and adapting to climate impacts, which could help enhance the viability of fishing communities.

Connecting Blue Justice and Value Chain in Chilika Lagoon

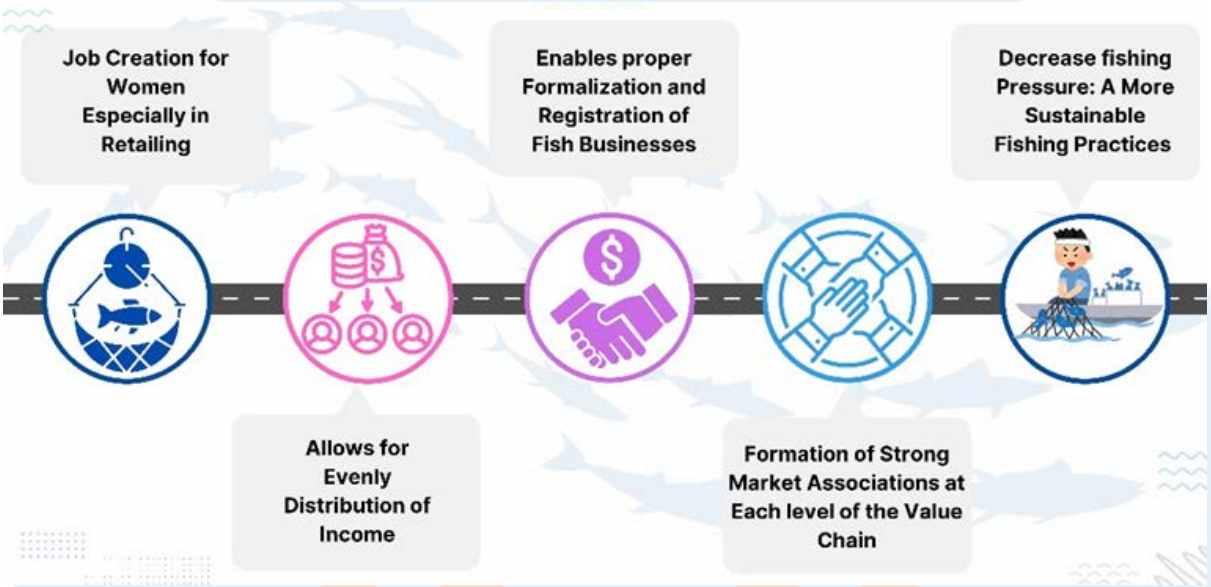
Blue Justice, in the context of the fish value chain, refers to ensuring equitable and sustainable practices throughout the entire process, from fishing to consumption. This involves addressing issues of fairness, environmental protection, and social responsibility (Bell et al,2021). This group has therefore questioned whether in order to ensure fair opportunities and equitable distribution of benefits and burdens among stakeholders in the Chilika value chain, there a need to strengthen cooperatives and improve market access. By this, creating a more equitable and sustainable Chilika value chain that benefits all stakeholders, especially small-scale fishers, is possible.

The delicate balance between the rights of fishers and their responsibilities for sustainable practices is important to preserve the ecological integrity of Chilika Lake. Declining catch, fishing bans, and lean seasons have significant implications for the entire value chain, affecting middlemen, wholesalers, retailers, and consumers. Reduced supply can lead to higher prices, decreased profits, and potential job losses. By balancing the rights of fishers with their responsibilities for sustainable practices, is it possible to create a more resilient and equitable Chilika fish value chain that benefits both people and the environment? Could promoting equitable participation for all stakeholders, including women, youth, and marginalized communities, serve as a strategy to empower these groups within the value chain and foster the creation of a sustainable ecosystem? Initiatives such as skill development programs, access to financial resources, and

fair-trade practices can be possible mediums for strengthening community resilience. Does prioritizing Procedural, Distributive, Economic, Environmental, Regulatory, Social justice encourage a more equitable and resilient value chain by improving the position of small-scale fishers in the Chilika value chain? Can policy interventions, such as fair-trade regulations, sustainable fishing practices, and building cooperatives, empower fishers to negotiate better terms and access broader markets? Can empowering Indigenous communities, to participate in the value chain, and diversification into other related activities such as fish processing and aquaculture, help improve household income and reduce reliance on capture fishery?

Figure 6

Summary of opportunities within Balugaon fish market value chain in Chilika Lagoon, India



4.5 Sociocultural dynamics of Chilika Lagoon

There are several sociocultural challenges linked to blue justice in the Chilika Lagoon. The visit to the Balugaon fish market in Chilika highlighted the distinct gender roles of women in fish processing, particularly in cutting and drying fish. The market showcased a significant participation of both men and women. While men predominantly occupied positions of power as shop owners or middlemen (Mahajans), women were observed undertaking more labor-intensive roles as fish cutters, processors, or handlers of dried fish. This gendered division of labour is deeply rooted in cultural norms, as well as socioeconomic factors and market access (Akingbola & Kusumawardhani, 2024).

Despite their significant contributions to the fishery sector, women face several challenges, including limited access to education, capital, and infrastructure for proper fish processing, drying, and storage. These barriers highlight how the existing structures within fishery management may inadvertently marginalize women, reducing their ability to fully participate in and benefit from the industry. Another interesting observation that highlights the gender dynamics in the Balugaon fish market was that some women have managed to accumulate enough capital to buy fish and engage in self-processing before selling them in various locations around Chilika Lagoon, including Bhubaneswar. Many of these women successfully support their families through this work, yet do not own any market infrastructure, even after reaching a level of economic stability.

Figure 7

Men – shop owners sitting under a concrete shade and women – cutting fish under an umbrella hat as shade

Source: Photo by Sanzida Alam

This dynamic role and participation highlight larger issues within the socio-economic structures of fisheries, linking to the concept of Blue Justice. Blue Justice highlights equitable and inclusive practices in marine resources management, addressing barriers faced by marginalized groups, particularly women. In this reflection, the gendered structure of the Balugaon market provided a showcase that women, despite being key actors in fish production, processing, and marketing, remain constrained by cultural norms and power dynamics. For blue Justice to be realized, there must be concerted efforts to empower women and ensure their meaningful involvement in fisheries management, acknowledging them as key players along with the men in the broader Chilika Market system.

Youth Aspirations and the Future of Ecological Stewardship in Chilika

Discussions around youth and their aspirations occurred multiple times during our conversations with the communities. The question around aspiration appears more pertinent because it remains inextricably tied to socioeconomic structure, and it remains significant for anticipating viable futures for the ecological system of the Chilika lagoon. Many of the individuals we spoke with expressed a desire for their children to have access to educational opportunities and pursue livelihoods outside of fishing. One of the main reasons they cited is that fishing has become less financially rewarding due to declining fish catches and other challenges, which have placed their traditional livelihood in a peril. However, it is not just the economic logic that undergirds the aspiration to move out of fishing; there are other sociocultural aspects tied to it. For instance, few of them spoke about the stigma attached to the caste identity of the fishers, which is why alternative livelihoods appear to them as avenues for social mobility; however, we can't ascertain this correlation very conclusively given the limited extent of our conversations. A few of the

fishers that we met during our visit to the villages shared their aspirations, but at the same time, they expressed concerns over not having the means to actualize such aspirations.

Figure 8

Children in the Barkul fishing community situated along the Chilika lagoon

One of the corollaries emerging from the question around aspiration is whether and in what ways this aspiration for moving out of fishing might impact the future of the lagoon as a social-ecological system. The practice of fishing implicates a certain form of attunement with the lagoon and its entire ecosystem, due to which the traditional fishers remain imbued with a sense of ecological stewardship that stems out of their experiences and perceptions of the intricate relationalities that bind them with the ecosystems. While reflecting on the changing aspirations of the fishers, one of the questions that came to our mind is – what happens to ecological stewardship when people move out of fishing and the embodied relationships are ruptured? On that note, one of us had an interesting conversation with two members of the fishing communities.

One of the fishers shared that even if he wouldn't like his child to get into fishing as a livelihood, he still very often makes his young son accompany him to fishing just to get the child familiarized with the ecosystem and the rich repositories of knowledge that the traditional fishers have. He further emphasized that while he would like to see the child going to school and eventually pursuing a job in the formal sector, he still felt it'd be significant for the child to know about the roots of their belonging.

5. Summary and Conclusions

The Chilika Lagoon exemplifies the delicate interdependence of natural ecosystems and human societies. Its ability to sustain livelihood while maintaining ecological health depends on an inclusive and equitable approach to governance that recognises marginalised communities' voices and incorporates local knowledge into decision-making. The insights gained from the V2V Field School, particularly through the lens of Blue Justice highlight the urgency of implementing governance frameworks that prioritise equity,

transparency, and local voices. The struggles between the formal and informal stakeholders, the marginalised fishers, and inequalities in tourism management, vividly highlight systematic gaps that need urgent attention. Similarly, the Balugaon fish market dynamics further demonstrate the fragility of value chains and their impacts on community livelihoods. Chilika's future depends on a crucial realisation: conservation cannot come at the cost of exclusion, nor can development succeed without equity. To bridge gaps between development, equity, and sustainability, we must rethink how shared resources, or commons, are managed.

The challenges, however, are not unique to Chilika– they reflect border patterns of inequality and environmental pressure in coastal systems worldwide. They demand collaborative efforts between policymakers, researchers and local stakeholders to address the socio-ecological challenges effectively. This research team reflects on the following questions as scholarship on blue justice and the governance of natural resources in the Chilika Lagoon and worldwide continues to mature.

1. Could Chilika be viewed as an assemblage of multiple socio-ecological relations that entail elements of the move from vulnerability to viability, and what is the position of blue justice in this move?
2. Can participatory mapping be used as a tool against injustice in coastal communities, to prevent any future conflicts and possible impacts on community livelihoods, what are the possible avenues which can be taken to ensure this?
3. What significance does culture have in coastal communities and how the relationship between communities, culture and conservation can be a foundation for the success of conservation to exist with the success of community livelihoods?
4. What approaches can be taken to ensure benefit sharing and equal distribution of resources in the blue economy, not only in policy but in the lives and livelihoods of coastal communities?

A significant limitation of this reflection paper was the language barrier, which made in-depth conversations with the community members a bit challenging even after the translation support. Additionally, we stayed in the area for only seven days, which limited our ability to engage deeply with the community and gather comprehensive data or information.

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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.

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