



Governing sociocultural sustainability through standards: Evidence from aquaculture eco-certification schemes[☆]

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ABSTRACT

Nonstate certifying authorities have long used standards as a governance instrument to improve sociocultural sustainability in the aquaculture sector. However, studies document that sociocultural sustainability has been marginalized in aquaculture certification standards. Against this background, I explore the purview of the sociocultural “principles” embodied in standards to improve sociocultural sustainability in aquaculture development. Although the burgeoning scholarship underscores the coverage of sociocultural indicators in aquaculture certification standards, there is limited research on what principles are included in standards to advance sociocultural sustainability in aquaculture. To address this question, I draw on one of the four dimensions of the “full-spectrum” sustainability framework (FSF), namely, the sociocultural dimension, to compare the extent to which such principles correspond to the FSF. Using the interpretive method, I examine six standards of five transnational aquaculture eco-certification schemes. I argue that standards overwhelmingly underscore issues concerning health and well-being, whereas the emphasis on improving producers’ ethical practices and resolving burning issues that profoundly affect indigenous peoples and local communities is comparatively fragile. I further contend that the Naturland, Global Good Agricultural Practice, and Friend of the Sea’s (FOS) aquaculture certification standards are weaker than the Aquaculture Stewardship Council and Global Aquaculture Alliance standards, and the FOS standard is the weakest in terms of addressing sociocultural sustainability. I conclude that the exclusion of, and negligible attention to, crucial sociocultural issues can potentially undermine the vision of standards to ensure and govern sociocultural sustainability in aquaculture, thereby providing a rationale for improving certification standards.

1. Introduction

Standards have been used as important normative instruments for improving and governing sociocultural, economic, and environmental sustainability in various commodity sectors. Designed with obligatory principles¹ (Saha, 2022), standards have been deemed a “noncoercive” mode of regulation (Arnold, 2022) and a key mechanism of international governance (Abbott and Snidal, 2001). They reinforce “the accountability of those being governed” (Arnold, 2022: 375), govern the

behavior of people and institutions (Ponte and Cheyns, 2013), address any perceived “regulatory vacuum” resulting from a lack of state regulation (Brandi, 2017), and promote sustainable development (Ikram et al., 2021). Hence, standards have become a cornerstone of governing transnational sustainability (Loconto and Fouilleux, 2014).

Created by standard-setting organizations, standards have proliferated remarkably since the early 1990s (Djama et al., 2011) in a range of sectors, such as fisheries (Foley, 2019), forestry (Cashore et al., 2004), and coffee (Dietz et al., 2021). This proliferation is due to regulatory and

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¹ In this paper, I use the term “principles” to indicate norms and codes that are created by standard-setting organizations and certification agencies, which use an assemblage of principles to create aquaculture certification standards. Principles are mandatory and written under different indicators and criteria (e.g., the Aquaculture Stewardship Council [ASC] Salmon standard). They provide normative guidance to producers, who must comply with them to obtain a certificate. These principles are used to govern sustainable aquaculture production.

production changes tied to globalization and neoliberalism as well as competition among certification agencies for legitimacy, credibility, and authority in defining the rules of sustainability (Raynolds et al., 2007; Foley and Havice, 2016; Smith and Fischlein, 2010). It has also started a debate over whether we have too many standards in the field of transnational sustainability governance, as Brunsson and Jacobsson (2000) argue that we effectively reside in a “World of Standards.”

However, regulatory and production changes and certifiers' competition also permeate the aquaculture sector. Since the early 1980s, challenges regarding sustainable aquaculture development, aspirations to upgrade the socioenvironmental performance of fish production, consumer concerns about food safety and quality, and market demands for sustainably-sourced farmed seafood have spurred a kind of competition among standard-setters and certifiers that has driven the creation, proliferation, and adoption of standards for sustainable aquaculture (Stonich and Bailey, 2000; Washington and Ababouch, 2011; Anh et al., 2011; Naylor et al., 2021; Saha, 2022). The growth of standards and their greater uptake are also due to the complexity and fragmentation of state regulatory mechanisms for aquaculture governance (Vormedal, 2017).

Recently, the prominence of standards for aquaculture development has increased along with growing initiatives by seafood buyers (e.g., supermarket retailers) to validate their products as sustainable, minimize risks associated with safety, and avoid criticism for negative production practices (Bush and Duijf, 2011; Roheim et al., 2018). Standards have also gained importance among farmed seafood producers seeking to advance production processes, benefit from lowered production costs, and gain access to international markets at higher prices (Bronnmann and Asche, 2016; Bush, 2018). Owing to customer preferences, producers often use multiple standards of different eco-certification schemes² simultaneously. However, aquaculture certification standards differ not only by schemes, species, and geographic location (Saha, 2022) but also by purpose, such as improving food safety, food quality, animal welfare, social responsibility, or environmental integrity (Nilsen et al., 2018).

Although the purpose of aquaculture certification standards is to improve the sector's performance, these standards have concurrently created complexity and confusion over sustainability goals because of the coexistence of multiple standards for aquaculture development (Osmundsen et al., 2020). Such standards also have an “exclusionary” impact on the poorest fish producers, which has been linked to the excessive costs of financing and investment (Hansen and Trifković, 2014). In addition, these standards have been subjected to criticism for the marginalization of actors from developing countries by disrespecting producers' knowledge and ignoring their interests (Hatanaka, 2010). Although the idea of sustainability underscores socioeconomic benefits and environmental integrity (Tlustý et al., 2019), studies argue that aquaculture certification standards are only marginally interested in embracing the social and cultural aspects of sustainability. For example, Osmundsen et al. (2020) identified that while 46% of the indicators of aquaculture certification standards underline environmental aspects, only 1% address cultural issues that are characterized as showing a “skewed understanding of sustainability.” Studies note that aquaculture certification standards do not address “social justice” and “social responsibility” (Kittinger et al., 2017) and play an extremely limited role in upholding working conditions, human rights, and ethical standards and addressing child labor and inequality (Aguayo and Barriga, 2016; Haugen et al., 2017; Bennett, 2018). Thus, aquaculture certification standards have marginalized social and cultural aspects (hereafter

sociocultural) of sustainability.

To date, few studies have examined the sociocultural dimension of sustainability in aquaculture, which differs significantly from this study. Although Haugen et al. (2017) reported the shortcomings in aquaculture standards' ethical guidelines, they did not examine standards of transnational³ aquaculture eco-certification schemes; rather, the aforementioned scholars analyzed international codes for sustainable aquaculture. Based on reviewing salmon standards alone, SustainFish (n.d.) and Amundsen and Osmundsen (2018) documented the coverage of 1916 indicators that encompass cultural indicators related to, for example, community integration, employee interests and well-being, and respect for indigenous culture. Drawing on these indicators, Osmundsen et al. (2020) showed indicators' distribution across four subdomains of the “wheel of sustainability” and Alexander et al. (2020) analyzed “social sustainability.” However, these studies have not provided a “comparison” of the sociocultural issues discussed in standards, and an interpretation of these issues in terms of eco-certification schemes and standards is still absent. These studies also lack documentation of what principles are set for producers to address burning issues that affect local communities, indigenous peoples, workforce health, safety, and well-being,⁴ and the ethical standards of operators negatively.

Given the paucity of scholarship, there is a pressing need to examine sociocultural principles set in standards to promote indigenous peoples; local communities; health, safety, and well-being; and ethical practices by producers. These issues are crucial for achieving sociocultural sustainability in aquaculture, yet little is known about what principles are included in aquaculture certification standards to advance sociocultural sustainability and to what extent these principles correspond to the sociocultural dimension of the full-spectrum sustainability framework (FSF) (Stephenson et al., 2018). By addressing this research gap, I extend Alexander et al. (2020) and Osmundsen et al.'s (2020) findings. I also contribute to the aquaculture eco-certification field by providing a deeper understanding of the inclusion of sociocultural principles in standards, examining the extent to which these principles embrace sociocultural sustainability, comparing the principles in terms of schemes and standards, and identifying sociocultural problems of aquaculture that standards ignore.

Owing to a particular focus on sociocultural sustainability, I draw on the FSF's sociocultural domain to examine and compare the sociocultural principles of six standards of five transnational aquaculture eco-certification schemes. The results suggest that standards disproportionately reflect the FSF's sociocultural constituents because they overwhelmingly underscore the workforce's health, safety, and well-being, while the emphasis on improving producers' ethical practices and addressing crucial issues that affect indigenous peoples and local communities negatively is relatively fragile. Furthermore, while the Aquaculture Stewardship Council (ASC) and Global Aquaculture Alliance's Best Aquaculture Practices' (GAA-BAP) standards appear to be more suitable than the Naturland and Global Good Agricultural Practice (GlobalGAP) in supporting sociocultural sustainability, the Friend of the Sea's (FOS) standard is extremely ill-suited. Standards also exclude principles on smallholders' well-being and marginalization, dispossession, and the displacement of farmers and natural resource users. Such exclusion, coupled with a negligible focus on indigenous peoples, the surrounding communities, and ethical practices, undermines the fundamental aims of standards to advance and govern sociocultural sustainability in aquaculture. Although the inclusion of the

² Eco-certification schemes in the aquaculture sector started to emerge in the late 1980s with the aims of addressing the environmental and social effects of industrial fish farming, ensuring food safety and quality, fulfilling consumer demand for sustainably farmed seafood, facilitating retailers' efforts to reduce their brand risk, and improving production practices (Bush, 2018; Saha, 2022).

³ Vandergeest (2007) argues that certification schemes are deemed transnational if they “operate transnationally across states, and none of them welcome the participation of states in their governance structures” (p.360).

⁴ In this paper, well-being is seen as measures set in certification standards to ensure happiness, prosperity, and the welfare of the workforce, indigenous peoples, and local communities by providing benefits and facilities.

mentioned issues would potentially enhance the inclusiveness and wider acceptability of standards, it does not warrant improving the sociocultural sustainability of aquaculture development given the purpose of standards to serve business interests and increase market access for producers (Samerwong et al., 2017; Vormedal and Gulbrandsen, 2020).

The remainder of this paper is organized as follows. Section 2 describes the sociocultural sustainability challenges of aquaculture development. Section 3 explains the materials and methods used for this study. Section 4 presents the findings. Section 5 discusses the extent to which the principles of aquaculture certification standards correspond to the FSF's sociocultural dimension. Finally, Section 6 concludes the paper.

2. Sociocultural sustainability challenges of aquaculture

Since 1974, the production of wild fish stocks has declined steadily owing to states' poor decision-making, fragile management structure, politics around wild fishery management, overfishing, ocean acidification, and increased state intervention (Hilborn, 2007; Hoque, 2021; Rosenberg, 2003). The collapse in capture fisheries has caused a relative stagnation in wild fish production since the late 1980s, thereby justifying the development and growth of aquaculture as an alternative source of fish supply (Saha, 2022). Alongside ensuring seafood for billions of people, aquaculture contributes to the "protein fix" by fulfilling an increased global demand for fish protein and nutrition (Brent et al., 2020). It ensures food security and affordable healthy diets for a growing population (FAO, 2022).

Over the past decade, aquaculture has created numerous opportunities and benefits across the world. In southern countries (Bangladesh, India, and the Philippines), it has contributed to large foreign exchange earnings and macroeconomic growth (Dey and Ahmed, 2005; Saha and Kamal, 2023), increased fish consumption by rural poor (Toufique and Belton, 2014), provided sustainable rural livelihoods (Duarah and Mall, 2020), seen a rise in incomes and savings of indigenous households, enabled poverty eradication (Pant et al., 2014), and aided the employment and empowerment of women (FAO, 2022; Lam et al., 2022). Owing to high profits, people who were involved in traditional fisheries and agriculture in Orissa (India) have left their jobs and engaged in aquaculture (Pattanaik and Prasad, 2011). In northern countries (Australia, Canada, Norway, and Ireland), aquaculture has been creating rural employment, revitalizing coastal communities, attracting immigrants in rural regions, and contributing to economic growth (Tiller et al., 2015; Vince, 2018; Kraly et al., 2022; McManus et al., 2022). To enhance its reputation, aquaculture operation in many countries, for example, Germany and Sweden, requires professionals with a high level of education (Nicheva et al., 2022). Given its remarkable role in socio-economic advancement, aquaculture is now deemed a viable strategy for pursuing sustainable development (Bogadóttir, 2020).

Notwithstanding various impressive contributions, the aquaculture sector has been undergoing "serious challenges" that undermine its ability to ensure sustainable practices (Naylor et al., 2021) and overshadow its benefits to broader society. These challenges are varied in terms of regions, countries, and types of aquaculture. Some earlier studies (Bailey, 1988; Stonich and Bailey, 2000; Primavera, 2006) documented that shrimp mariculture in Asia (Bangladesh, India, Indonesia, Thailand, Vietnam, and the Philippines) and Latin America (Ecuador, Panama, Peru, Honduras, and Brazil) caused the displacement of small-scale producers, the loss of livelihoods, the marginalization of surrounding communities, the privatization of open-access resources, the transformation of agricultural and residential lands, a skewed distribution of wage and benefits, human rights violations, conflicts, and violence.

Nevertheless, challenges continue to increase in southern countries. In Bangladesh, industrial shrimp farming has resulted in conflicts over controlling and grabbing resources (land and water) and distributing profits (Adnan, 2013; Afroz et al., 2017). The cascading effects of such

conflicts include violence, robbery, abduction, murder, and the dispossession of landowners and poor peasants in the coastal shrimp zones of Bangladesh (Saha and Kamal, 2023). In Vietnam, shrimp, crab, and clam aquacultures result in greater income inequality, little livelihood diversity, and less cohesive social networks in coastal resource-reliant communities (Orchard et al., 2015). In Chile, the Mapuche indigenous group still fights against salmon producers to ensure their rights and self-determination (Evans, 2021).

Moreover, the sector's reputation is plagued by labor-related disputes. Bosma et al. (2018) identified gender inequality in Vietnamese aquaculture, where female workers are subjected to unequal wages and uneven access to training opportunities and decision-making processes. In Bangladesh, women working in the shrimp industry are paid less than their male counterparts (Nuruzzaman et al., 2014). Likewise, in Western Kenya's aquaculture sector, women (83%) are involved in unpaid work (Githukia et al., 2020). Cavalli et al. (2019) identified the presence of child labor and forced migrant labor in Thailand's shrimp industry and Ghana's aquaculture industry. This study further notes that aquaculture laborers in Sub-Saharan Africa, Latin America, and Caribbean countries work in extreme heat, a concerning health and occupational safety issue. Human trafficking has appeared as a crucial labor issue in the aquaculture and fisheries of, for example, Cambodia, Indonesia, Madagascar, Malawi, Mauritius, and Vietnam (Verité, 2016).

Challenges are also unfolding in northern countries. The Faroe Islands' salmon farming industry has seen the illegal displacement of lobster fishers, disruption of traditional livelihoods and income sources, and appropriation of land and resources from local communities engaging in protests and conflicts with salmon producers (Bogadóttir, 2020). Given the increased socioeconomic (and environmental) impact, local communities and environmental nongovernmental organizations have expressed concerns about the Tassal company's salmon farming practices in Tasmania, Australia (Vince and Haward, 2017). Although Tassal has ASC accreditation, the broader Tasmanian community has withheld its "social licence to operate" with respect to production activities (Vince and Haward, 2019). Indigenous groups in Canada, particularly in the Broughton Archipelago on the Pacific coast, have opposed salmon farming in traditional territories and organized protests against it on the premise that it would undermine their rights over aboriginal land and disrupt customary livelihoods (Young et al., 2019). Young et al. (2019) also identified growing local opposition to the establishment of new salmon production sites in Norway, where the indigenous Sami people are concerned about local knowledge regarding the impacts of salmon farming being disregarded. Iceland's anglers and river owners have demanded restrictions on salmon aquaculture due to income loss from the recreational Atlantic salmon fishery (Young et al., 2019).

Moreover, unpaid labor has featured in Hawaii's aquaculture farms (e.g., crustaceans and catfish) (Naomasa et al., 2013). Studies have explored occupational health and safety risks in the developed world's aquaculture sector. Although the rates are declining, Holen et al. (2018) reported fatalities in Norwegian salmon and trout farms. Ochs et al. (2021) indicated that marine aquaculture workers in Atlantic Canada suffer from injuries that are akin to the injury patterns found in workers in Norway, Finland, Australia, and the United States, while Neis et al. (2023) demonstrated the potential health and safety risks for workers associated with the accidental death of a large number of farm-based marine salmon in Chile, Ireland, Norway, Scotland, and Canada. Overall, the enduring challenges across the world have caused a debate around unsustainable practices in industrial aquaculture, thereby arguably pressing certification authorities to address barriers to sociocultural sustainability by setting principles of production in their standards. For instance, unsustainable labor practices in the Chilean salmon industry drove the incorporation of labor-related principles in the ASC salmon standard (Aguayo and Barriga, 2016).

3. Materials and methods

3.1. The full-spectrum framework and sociocultural sustainability

To examine and compare the sociocultural principles of standards, I draw on the FSF's sociocultural dimension of sustainability. Developed by the Canadian Fisheries Research Network (CFRN), the FSF outlines management objectives intended to govern fishery resources sustainably, thereby contributing to the current efforts to integrate human and social dimensions into sustainability assessments (Stephenson et al., 2018). The FSF offers an overarching view on performance indicators to assess the ecological, economic, institutional, and "social and cultural" dimensions of sustainability. While the United Nations sets three domains of sustainability, namely, social, economic, and environmental (Asche et al., 2018), the FSF provides a broader outlook by incorporating cultural and institutional dimensions. Although the CFRN adds the term "cultural" in referring to the "core elements" of the "social and cultural" dimension, the idea of culture is being neglected given that the FSF only underlines the social domain while describing its objectives and performance indicators (Stephenson et al., 2018; 2019). Despite this inattention, the FSF's social dimension still reflects cultural issues, implying that the framework locates culture as an integral part of a social system.

Before elucidating the FSF's sociocultural dimension, there is a need to identify the defining features of social and cultural sustainability in the context of aquaculture. Alexander et al. (2020) outlined the key characteristics of social sustainability, which include labor issues (fair payment, health safety, and contract), ethical conduct, equity, social cooperation, and equitable benefits distribution. The salient features of cultural sustainability include respect for the indigenous culture, employee well-being and interests, community integration and contribution, and the social capital (relationships and networks) of local communities (SustainFish, n.d.; Amundsen and Osmundsen, 2018; Osmundsen et al., 2020). The aforesaid traits also conform to other sectors (e.g., agriculture and livestock) that conceptualize "sociocultural sustainability" based on respecting rights to land, property, and natural resources; barring child and slave labor; providing health care; maintaining community development and relations; ensuring social responsibility; enabling gender equality; providing benefits and maintaining well-being; ensuring appropriate working conditions; and recognizing human rights (Boogaard et al., 2011; Rasmussen et al., 2017; Zhang et al., 2021).

The FSF's sociocultural dimension consists of three constituent elements: sustainable communities, health and well-being, and ethical issues. To make a local community sustainable, the FSF emphasizes social capital that can be built and strengthened through, for example, promoting shared values and norms of the local community, participating in community-based social institutions, and building social networks with surrounding communities. For an "informed citizenry," it prioritizes, for example, a valuation of community preferences and the organization of community events. The "civic culture" is crucial for a sustainable community that can be understood through, for example, observing conditions of local education and social institutions. The promotion of well-being among people in the neighborhood is also a precondition to make a community sustainable. The health and well-being criterion includes, for example, addressing occupational safety (e.g., number of injuries and deaths and job safety), food safety, the availability of basic services (e.g., housing and medical care), unemployment, migration, and poverty. The ethical paradigm pays particular attention to rights, equity, codes of conduct, and the well-being of individuals and the local population.

Although the FSF is developed for the fishery sector, the indicators described under three sociocultural constituents are mostly aligned with defining characteristics of social and cultural sustainability in aquaculture, including other sectors. Despite many resemblances, I altered the aspects concerning sustainable communities because standards do not underline civic culture and an informed citizenry. Other community-

related issues are in line with aquaculture certification standards. Instead of sustainable communities, however, I emphasize indigenous peoples and local communities. In particular, this change is due to the absence of indigenous peoples in the FSF's sociocultural dimension. Furthermore, I add "safety" to the FSF's health and well-being criterion to illustrate principles of occupational safety. In this study, while social sustainability lies in ensuring the workforce's health, safety, and well-being and improving producers' ethical practices related to labor, cultural sustainability is embedded in addressing negative impacts and conflicts that undermine community relations and trust and diminish the rights, values, and well-being of indigenous peoples and local communities. In short, drawing from the FSF's sociocultural dimension, which is comparable with the defining traits of social and cultural sustainability in aquaculture, including other sectors, I analyze sociocultural sustainability by considering three broad constituents—health, safety, and well-being; ethical practices; and indigenous peoples and local communities—that are best suited for encapsulating the sociocultural aspect of standards.

3.2. The usefulness of the full-spectrum framework

Although the FSF is built for sustainable fishery management and its sociocultural domain has some limitations, as identified above, it is still useful for examining the sociocultural principles of aquaculture certification standards owing to four reasons. First, notwithstanding some variations, the FSF's three sociocultural constituents are comprehensive given that their performance indicators define attributes of sociocultural sustainability in not only aquaculture but also other sectors e.g., agriculture and livestock. Second, the available comprehensive frameworks (e.g., Garcia et al., 2000; Anderson et al., 2015; FAO, 2015; Kinds et al., 2016) for upholding sustainability in the seafood sector pay comparatively less attention to pinpointing sociocultural issues broadly (Stephenson et al., 2018). Against this backdrop, the FSF's three sociocultural constituents offer an extensive outlook that captures issues that precisely represent sociocultural sustainability.

Third, the use of the FSF in examining transnational eco-certification schemes and their certified farms has increased. For instance, while Mussells and Stephenson (2020) employed the FSF to examine and compare forest, fisheries, and aquaculture eco-certification schemes, Foley et al. (2018) used it to assess the social sustainability of a shrimp fishery certified by the Marine Stewardship Council (MSC). Finally, alongside the increased application of FSF in evaluating sustainable fisheries (e.g., Marentette and Zhang, 2022), it has been gaining prominence through use as a reference in research on coastal and marine management (Eger and Courtenay, 2021), social-ecological systems (Armitage et al., 2019), marine biological resource management (Ruiz-Díaz, 2023), and sustainable development goals (Stoddart et al., 2023), which demonstrates the legitimacy and credibility of this framework at the international level. In summary, despite a few limitations, the above rationales indicate that the FSF is still the best template available for examining and comparing the sociocultural sustainability of aquaculture certification standards.

3.3. The selection and analysis of standards

This study builds on the analysis of six standards of five transnational aquaculture eco-certification schemes (Table 1). I chose standards based on two criteria. First, I applied the idea of transnationality to select six standards that are used to certify aquaculture production facilities across states. I excluded standards that are only operated nationally (e.g., the Vietnamese Good Aquaculture Practices certification standard [Marschke and Wilkings, 2014]) and regionally (e.g., the Association of Southeast Asian Nations Good Aquaculture Practices for shrimp producers [Samerwong et al., 2017]). Furthermore, I considered standards of eco-certification schemes (ASC, GAA, GlobalGAP, Naturland, and FOS) that have operated transnationally and captured international

Table 1
Chosen transnational aquaculture certification standards.

Certification Agency	Acronym	Standard Name	Version/ Review	Release Year
Naturland Aquaculture Stewardship Council	Naturland ASC	Aquaculture Shrimp, Salmon	v-6 v-1.0, v-1.1	2018 2014, 2017
Global Aquaculture Alliance ^a	GAA	Salmon	r-3(2)	2016
Global Good Agricultural Practice	GlobalGAP	Aquaculture	v-5.2	2019
Friend of the Sea	FOS	Marine Aquaculture	r-2	2014

^a Based on “best management practices” for producers, the GAA created its Best Aquaculture Practices (BAP) certification standards to assess farms and hatcheries before granting a certificate (Saha, 2022). This study analyzes the GAA-BAP salmon standard.

farmed seafood markets for over a decade (Saha, 2022).

Given the emphasis on transnationality, I also excluded governmental standards that operate within states and included nongovernmental ones that have been developed by private organizations, civil society, and market actors and have been used across states. Second, I employed three sociocultural constituents to choose standards. I selected six standards because they contained the maximum number of indicators and related principles associated with health, safety, and well-being, ethical practices, and indigenous peoples and local communities. Although the ASC and GAA have multiple species-specific standards, I selected salmon (ASC and GAA) and shrimp (ASC) standards alone because these species are widely traded and have created negative impacts in northern and southern countries. I compared salmon and shrimp standards given the numerous similar impacts of the production thereof, although some vary by region. I examined the Naturland, GlobalGAP, and FOS’s aquaculture certification standards because they do not have any species-specific versions, and I gathered standards from archives of eco-certification agencies.

I analyzed standards following the interpretive method, which allows a researcher to present their own “constructions” since interpretive research implies that knowledge of reality is achieved merely through social constructions such as meanings, language, and concepts (Andrade, 2009). Inspired by the precept of the interpretive method, I read and analyzed standards to examine the articulation of sociocultural sustainability in the standards. During the manual coding process, I followed the FSF’s sociocultural constituents. To analyze the text of the standards, I followed the steps of content analysis: formulating research questions, defining categories, coding content, and interpreting data based on final codes (Krippendorff, 1980). Following the research questions and their relation to the FSF, I created a sociocultural category

Table 2
Category, subcategories, and codes used in the standards’ analysis.

Category	Subcategories	Codes
Sociocultural	Health, safety, and well-being	Accident, benefit, death, employment, equipment, emergency, facility, first aid, hygiene, injury, medical care, occupation, risk, safety
	Ethical practices	Abuse, bargaining, child, discrimination, equality, exploitation, fairness, forced, freedom, harassment, hour, involuntary, labor, overtime, payment, punishment, right, trafficking, voluntary, wage
	Indigenous peoples and local communities	Access, community, communication, conflict, consultation, culture, impact, indigenous, neighbor, network, norms, relation, respect, rights, values

(Table 2).

The interpretive character of this research allowed me to use the FSF’s sociocultural constituents as a reference to create three subcategories and various codes (Table 2) from the text of the standards. It also facilitated the determination of homogeneity between data (text) and subcategories given the variances in presenting sociocultural principles in the standards. I created codes for only those items that are included in the standards, guiding the analysis of principles (Section 4) and the identification of excluded sociocultural aspects (Section 5). I applied a descriptive coding technique to create codes (concepts and short phrases). The creation of codes required intensive reading of the standards, which helped summarize each passage and extract the meaning from the summaries. Subsequently, I analyzed the summaries to identify what principles are included in the standards and to what extent these principles correspond to the FSF’s sociocultural dimension of sustainability. I used subcategories and codes to organize the principles. Using Microsoft Excel, I created Fig. 1 to show the inclusion and exclusion of sociocultural issues.

4. Results

4.1. Sociocultural sustainability

4.1.1. Principles on health, safety, and well-being

The results demonstrate that despite variations in principles, aquaculture certification standards tend to ensure the health, safety, and well-being of the workforce involved in the production system (Fig. 1). To obtain and continue a Naturland certificate, its standard requires that operators must have a safety policy in place if they employ more than 10 workers, and this policy must address safety, health, and hygiene practices (Naturland, 2018). Regarding health and safety, the ASC standards differ from those of Naturland. The ASC salmon standard aims to promote workers’ health and safety through insurance, and the full costs of treatment must be borne by employers if any job-related accidents and injuries occur at the workplace (ASC, 2017). Its shrimp standard requires that producers must identify the causes of accidents, injuries, and fatalities and undertake corrective measures to avoid similar incidents (ASC, 2014). To reduce occupational hazards, the shrimp standard further underscores training and preventive actions for health and safety practices.

In terms of articulating principles, the GlobalGAP standard is more explicit than the ASC and Naturland. A written risk assessment, which is designed with a series of steps to assess risks and safety protocols and mitigate health hazards and accidents, is required for GlobalGAP certificate holders (GlobalGAP, 2019). To deal with identified risks in the workplace, farms should formulate emergency procedures and contingency plans. Similar to the ASC, GlobalGAP’s producers must provide their workers with training on first aid, hygiene practices, swimming, driving, entering confined areas, and the use of protective clothing, chemicals, boats, and machinery. Displaying legible and permanent signs that denote potential hazards in visible locations is a prerequisite for ensuring safety. The predominant language of the workforce must be used in key and emergency contacts, including instructions on emergency exits and the location of fire extinguishers. First aid kits, protective clothing, and respiratory equipment must be available and accessible at GlobalGAP-certified production sites. As with the ASC and GlobalGAP, GAA-BAP-certified producers also need to train their workers on health practices and safety measures. The GAA-BAP standard requires farms to develop an emergency response plan to address occupational risks and hazards (BAP, 2016). Although not explicit as the GlobalGAP, the FOS standard requires operators to ensure healthcare and safety measures for the workforce (FOS, 2014) (Fig. 1).

Facilities and benefits are the cornerstone of the well-being of the workforce. Naturland-certified farms must ensure food, water, accommodation, and basic medical care. According to the ASC shrimp standard, facilities in the workplace must be clean, rain-protected, safe, and

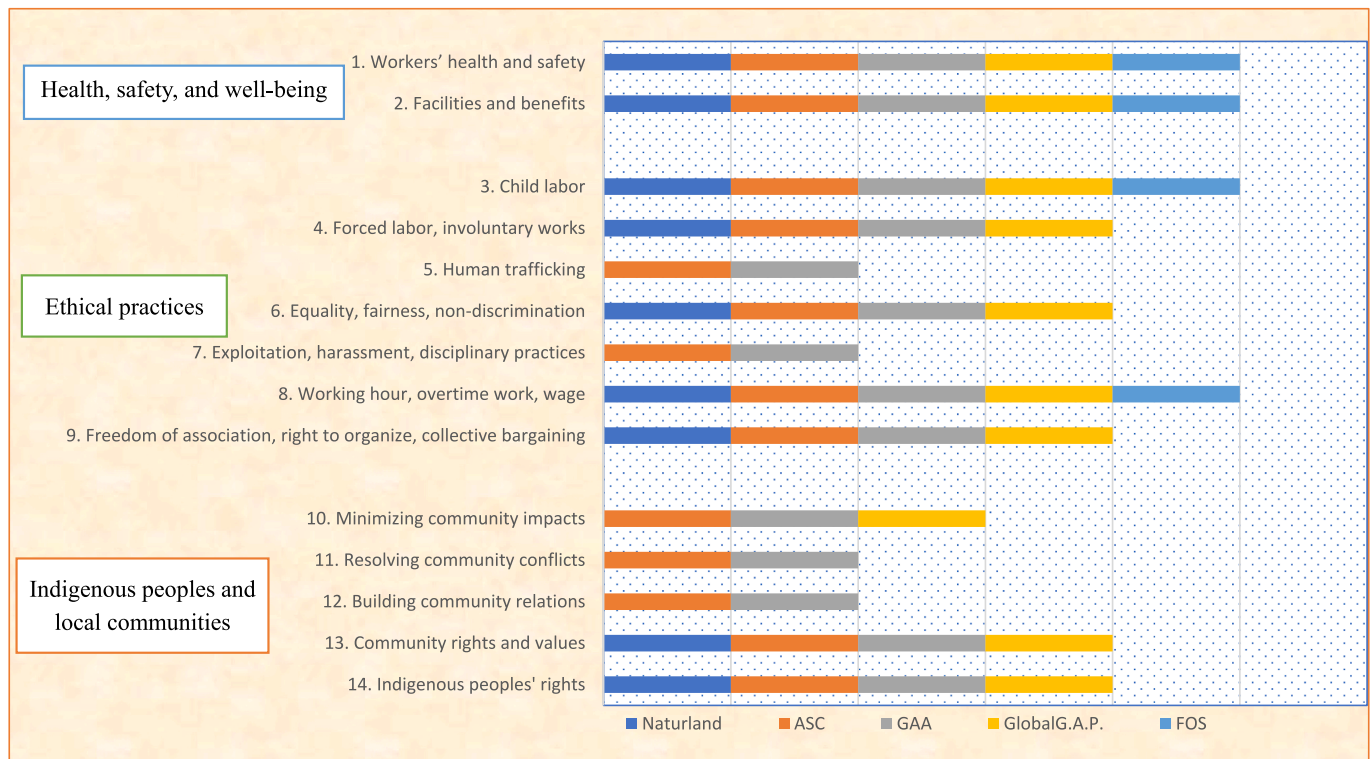


Fig. 1. Inclusion and exclusion of sociocultural sustainability issues in aquaculture certification standards. Naturland includes principles 1, 2, 3, 4, 6, 8, 9, 13, and 14 and excludes 5, 7, 10, 11, and 12. The ASC includes principles 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, and 14. The GAA includes principles 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, and 14. The GlobalGAP includes principles 1, 2, 3, 4, 6, 8, 9, 10, 13, and 14 and excludes 5, 7, 11, and 12. The FOS includes principles 1, 2, 3, and 8 and excludes 4, 5, 6, 7, 9, 10, 11, 12, 13, and 14.

suitable for habitation. If shrimp producers appoint more than five employees, separate toilets and sanitary facilities for male and female workers must be available at production sites. Facilities for the workforce employed at GlobalGAP and GAA-BAP-certified farms have broadly similar requirements, such as safe drinking water, common toilets, food storage, and first aid kits. However, the GAA-BAP standard adds more than the GlobalGAP and includes accommodation with adequate space, heating, ventilation, cooling, and trash bins.

Both the Naturland and GlobalGAP standards require operators to ensure educational facilities for children. Naturland also conforms to the ASC's shrimp standard of ensuring maternity rights such as providing pregnancy leave and prohibiting pregnancy testing. Operators seeking a Naturland certificate must provide their employees with basic social benefits such as sick leave and retirement. While the ASC's shrimp standard tends to ensure maternity rights, its salmon standard ignores maternity-related aspects. Those who hold a FOS certificate must comply with national laws on employee benefits and the working environment. In a nutshell, all standards have included, to some extent, principles to promote the health, safety, and well-being of their workforce.

4.1.2. Principles on ethical practices

Standards differ in outlining principles to improve the ethical performance of producers, particularly related to labor issues. Fig. 1 shows that all certifiers have prohibited the practice of child labor in aquaculture production. GAA-BAP-certified farms require abstaining from employing children in production activities. Although the Naturland standard prohibits the employment of children in farming activities, it permits the work of children in family and neighbors' farms if such practice does not jeopardize the health, safety, education, and psychosocial development of children. Such principles are reflected in GlobalGAP's requirement, which prohibits producers from employing children if the work appears risky and affects children's health, physical

development, and education.

The findings demonstrate that the Naturland standard differs from the others regarding the age of children. To employ children, Naturland-certified farms must comply with the International Labour Organization's (ILO) conventions and the UN conventions on children's rights. While the Naturland standard does not specify the minimum age of children, the ASC, GlobalGAP, and GAA-BAP require that operators shall not employ children below the age of 15. Without referring to any age limit to appoint children, the FOS standard merely mentions children should not be used in farms in a manner that is inconsistent with national regulations, ILO conventions, and international standards on child labor. While the ASC and GAA-BAP standards have relaxed the age cap for developing states (the minimum age is 14), aligning with the ILO's Minimum Age Convention 138 (ILO, 1973), the GlobalGAP standard does not allow producers to reduce the predetermined age limit.

To eliminate forced labor practices in the aquaculture sector, Naturland instructs producers not to retain any parts of workers' documents, property, salaries, and benefits that can be used to force workers to stay at operation sites. Likewise, the ASC requires that workers must be free to leave the workplace and if employers withhold any original identity documents, it will mean that work is being carried out against workers' will. Farms that are GAA-BAP-certified should also present proof that workers' identity documents are not being withheld. The results demonstrate that while the ASC, GAA-BAP, and GlobalGAP standards have included principles to prevent forced and involuntary labor practices, the FOS standard does not require operators to address these unethical issues (Fig. 1). Although human trafficking is an enduring problem, as identified previously, only the ASC and GAA-BAP standards mention this issue (Fig. 1) but lack any guidelines for producers on how to prevent it.

To address labor exploitation in aquaculture, only the ASC and GAA-BAP standards set principles. ASC-certified farms must not threaten or humiliate workers and must abstain from any disciplinary measures that

impact workers' health and dignity negatively. Its shrimp producers are prohibited from practicing verbal abuse, corporal punishment, physical and mental coercion, fines, and wage deduction. Its salmon producers are only allowed to use verbal and written warnings as disciplinary actions. The GAA-BAP salmon standard aligns with the ASC shrimp standard to punish workers. The GAA further instructs its BAP-certified farms to stop harassment and bullying in the workplace. Fig. 1 shows that while the ASC and GAA-BAP standards aim to prevent the harassment and exploitation of workers, no principles have, as yet, been included in the FOS, Naturland, and GlobalGAP standards, implying that these certifiers are less interested in addressing these problems.

To prevent labor exploitation, the standards include principles on working hours, overtime work, and wages (Fig. 1). While the Naturland and GAA-BAP standards do not prescribe fixed working hours, the ASC and GlobalGAP standards specify that the weekly working time should not exceed 48 hours (8 hours per day). The working hours at farms holding a GlobalGAP certificate should not be more than 60 hours during peak season, and farms certified by the ASC must ensure one full day off for workers. The results reveal the flexibility in Naturland's principles on working hours since it asks operators to set an "annual limit" of working hours. Only GAA-BAP-certified producers are required to align with national labor regulations on setting working hours.

While five standards set principles on overtime work, the FOS ignores them, allowing FOS-certified farms to continue exploitative practices and avoid setting working hours. The Naturland standard requires a mutual contract on overtime work, whereas the GAA-BAP and ASC standards state that overtime work should not be involuntary. Because payment is a crucial issue, ASC-certified farms need to pay workers at a premium rate. For GlobalGAP-certified farms, overtime payment must be recorded, aligning with work contracts and conforming to national labor laws. Furthermore, its certified farms are required to show documents (e.g., pay slips) of regular wage transfer to workers, and wages must be aligned with the national minimum wage and collective bargaining agreement. In terms of wages, the ASC, FOS, and Naturland standards are in line with the GlobalGAP. To address exploitation, the Naturland, GAA-BAP, GlobalGAP, and ASC standards require a written contract between employers and workers that contains the terms and conditions of employment, such as working hours, wages, disciplinary actions, overtime policy, benefits, rights, and facilities.

Given the importance of collective bargaining and freedom of association to uphold worker rights, the ASC instructs its salmon producers not to ban workers' access to trade unions and their rights to form organizations. Farms certified in compliance with the Naturland, GAA-BAP, and GlobalGAP standards must ensure that all workers have the right to organize and bargain collectively. The results reveal that the Naturland standard's principles on workers' freedom of association are more comprehensive than the other standards. Naturland instructs its certified farms to ensure workers' rights and freedom to reject or accept employment. Naturland-certified farms are prohibited from discriminating against workers for their membership in trade unions. Fig. 1 shows that the FOS is the only certifier that is not interested in workers' freedom to associate, organize, and bargain collectively.

In addition to promoting nonexploitative practices, the standards aim to ensure equality and fairness in the treatment of the workforce. Naturland-certified farms must maintain equality in social benefits, working environment, and other privileges. The Naturland standard requires all workers to receive equal pay and enjoy equal rights, opportunities, and benefits irrespective of sex, color, and religion. The findings reveal that although the ASC's principles (payments and benefits) align with Naturland, the ASC extends its requirements by adding equality in promotion, job security, training, and position. Its salmon producers must present an "anti-discrimination policy" to third-party auditors outlining procedures to file and respond to discrimination-related complaints by workers. The GAA-BAP standard also aims to ensure equality in recruitment, compensation, termination, and retirement regardless of age, gender, race, and faith.

Although the GlobalGAP standard aligns with other certifiers in promoting "non-discriminative" attitudes to workers, it differs in requiring compliance with the ILO's Discrimination (Employment and Occupation) Convention 111. Fig. 1 indicates that while four certification agencies have planned to promote equality and fairness practices, the FOS still lags far behind. In short, the GAA-BAP and ASC standards are the best owing to their inclusiveness of burning issues that influence producers' ethical practices. The Naturland, GlobalGAP, and FOS standards do not incorporate principles on human trafficking, exploitation, harassment, and disciplinary practices. The FOS also does not address forced labor, equality and fairness, freedom of association, the right to organize, and collective bargaining.

4.1.3. Principles on indigenous peoples and local communities

Standards differ substantially in terms of articulating, including, and excluding principles associated with indigenous peoples and local communities (Fig. 1). To ensure indigenous peoples' rights, the Naturland standard requires farms to comply with the UN Declaration on the Rights of Indigenous Peoples. If a Naturland-certified farm produces fish while infringing indigenous peoples' rights over land and water, their products cannot be traded with the Naturland trademark. Despite geographic variations regarding production, both salmon and shrimp standards of the ASC require respect for indigenous culture, rights, and traditional territories. The findings indicate that while the GAA-BAP standard requires producers to comply with laws protecting aboriginal resources, the GlobalGAP standard requires operators to be careful about potential impacts on aboriginal territories.

In addition to indigenous peoples, the standards have prioritized respecting the values and rights of local communities (Fig. 1). While the Naturland standard simply mentions respecting local peoples' rights, the GlobalGAP clearly states that operators must prove that production activities do not hamper local communities' access to drinking water and open fishing grounds. The ASC salmon standard adds more than the GlobalGAP as it directs farms not to impede communities' access to public land, freshwater, common fishing areas, and other natural resources. Farms need prior approval from local communities before restricting these resources. To achieve a GAA-BAP certificate, producers must prove their compliance with environmental and other applicable regulations to build and operate aquaculture and their legal rights to use land and water as well as dispose of waste in local communities. The findings imply that while the Naturland, ASC, GAA-BAP, and GlobalGAP standards have prioritized indigenous peoples and local communities, no such principle has been included in the FOS standard, making it the weakest certifier in this regard (Fig. 1).

The results demonstrate that through their standards, certifiers tend to push operators to enhance social networks and build relationships with people in the neighborhood. To guide operators on how to build community relationships, the ASC shrimp and salmon standards underscore meaningful engagement, consultation, and regular interaction with local communities that must be open and transparent and should focus on addressing concerns about restricting community access to resources. In addition, ASC salmon producers must arrange biannual meetings with elected representatives of affected communities, who will partly set meeting agendas aiming to prioritize the preferences of resource-dependent impacted communities. To build relationships and support local unemployed people, the ASC shrimp standard requires that before employing outsiders who are unable to travel from home daily, producers must advertise job vacancies to people in the neighborhood who live within daily traveling distance from operation sites. If operators employ the majority of their workforce from outside of their local community, they must prove that surrounding communities were informed first about vacancies. By prioritizing local people in job advertisements, however, the shrimp standard tends to reduce unemployment, thereby aiming to eradicate poverty and promote community well-being.

To foster relationships with local communities, the GAA-BAP salmon

standard underscores regular dialogue with people in the neighborhood. Unlike the ASC salmon standard, GAA-BAP-certified salmon producers are not required to hold biannual meetings with impacted communities. Furthermore, unlike the ASC shrimp standard, employing local people first is not a precondition for salmon producers intending to obtain a GAA-BAP certificate. The GAA-BAP standard warns its certificate holders not to inhibit community access to public areas and resources given that doing so will undermine efforts for network building and ties with local communities. GAA-BAP-certified operators must cooperate with rightful local resource users, aiming to build good neighborhood relationships and earn community acceptance for salmon production. The ASC and GAA-BAP standards reflect differently on community relationships and well-being, principles related to these issues have yet to be considered by the Naturland, FOS, and GlobalGAP standards, making them comparatively weaker than the ASC and GAA-BAP (Fig. 1).

In building harmonious relationships, conflict with local communities is a key barrier that mostly emerges from the negative impacts of aquaculture. To minimize impacts, the ASC requires operators to identify, evaluate, and address negative effects properly through a fair and transparent process. According to its shrimp standard, producers must undertake a participatory social impact assessment and share the results openly with surrounding communities using local languages. The findings must incorporate the potential risks and effects of shrimp aquaculture on local communities. Likewise, ASC's salmon producers need to share information about potential health risks and changes in accessing local resources. However, it also mentions that negative effects may not always be prevented and changes in access to resources are expected.

As with the ASC, the GlobalGAP standard also requires farms to inform local communities about the likely impacts of production. The GlobalGAP presses farms to minimize the impacts of waste disposal on surrounding communities. Its certified producers must rehabilitate and compensate affected local communities. Regarding waste disposal, the GAA-BAP standard provides clearer guidelines than the GlobalGAP, indicating that operators must store refuse in watertight containers with covers to protect objects from rodents and insects. GAA-BAP certificate holders must ensure that odors and noises do not affect communities and must store and dispose of chemicals safely and responsibly.

Without addressing negative impacts, conflicts are expected to increase. If conflicts arise, ASC-certified farms must consult and negotiate with local communities to mitigate tensions. Its shrimp standard requires producers to resolve a minimum of 50% of the total conflicts within one year from the date of the allegation. The GAA-BAP standard also aligns with the ASC and underscores the need for interaction, meetings, and dialogue to mitigate conflicts between farms and communities. GAA-BAP-certified farms need to formulate area management agreements to resolve conflicts with nearby communities. Since conflicts arise partly from land-related disputes, the GAA-BAP standard asks auditors to check land maps defining public and private areas, concession zones, and fences. Although addressing negative impacts and conflicts are key to building social relationships with local communities, such principles are not included in the FOS and Naturland standards (Fig. 1). Overall, the ASC and GAA-BAP standards are the best in terms of the inclusion and articulation of principles related to indigenous peoples and local communities. Both the Naturland and GlobalGAP standards exclude principles on relationships and conflicts with local communities. The GlobalGAP requires aquaculture impacts on communities to be addressed. However, the FOS standard is the weakest in that nothing is said about local communities and indigenous peoples.

5. Discussion

The results demonstrate that although the examined standards have set normative principles to ensure the workforce's health, safety, and well-being, uphold producers' ethical practices, and address issues that impact indigenous peoples and local communities negatively, these standards vary substantially in terms of their inclusion and exclusion of

principles and conformity to the FSF's sociocultural sustainability. The standards have put the highest priority on health, safety, and well-being followed by ethical practices and indigenous peoples and local communities. Apart from minor differences, the results herein are consistent with those of Alexander et al. (2020). While Alexander et al. assert that workers' health and safety is the third most important area that aquaculture certification standards underline, I identify this as the first such aspect. The ASC, GAA-BAP, Naturland, and GlobalGAP standards extensively address the FSF's health and well-being issues, whereas the FOS's alignment is negligible, characterizing it as the weakest certifier in this regard. However, most standards are in line with the FSF's health and well-being aspects, which is compatible with Mussells and Stephenson's (2020) argument that aquaculture certification standards set norms to improve health and safety practices. In addition to aquaculture, the Forest Stewardship Council's certification standard also corresponds to the FSF's health and well-being constituent, while the MSC fishery standard does not represent this element (Mussells and Stephenson, 2020).

Regarding the comprehensiveness in reflecting the FSF's sociocultural dimension, ethical practices receive the most substantial emphasis in the standards, implying that certification agencies have broadly addressed labor-related issues questioning the ethical integrity of producers. However, the findings differ from those of Haugen et al. (2017), who contended that ethical aspects are "almost barren" in aquaculture standards. This is because their results draw on international codes and guidelines for sustainable aquaculture, not on transnational eco-certification schemes. Despite variations in principles, child labor, working hours, and wages are the top labor-related aspects in the standards. While labor exploitation, harassment, and human trafficking are crucial to achieving "social sustainability" in aquaculture (Oseland et al., 2012; Bush et al., 2017; Clark and Longo, 2022), only the ASC and GAA-BAP standards have addressed these issues, and trafficking gets the least priority. This implies that the Naturland, GlobalGAP, and FOS are not interested in addressing these issues. Similar to aquaculture, the shrimp fishery certified by the MSC standard also does not reflect the social aspects of sustainability invoked by the FSF (Foley et al., 2018). However, regarding inclusiveness and comprehensiveness, the FOS standard is the weakest in improving producers' ethical practices. Its conformity to the FSF's ethical aspects is also the most fragile, while the strongest ones are the ASC and GAA-BAP standards. None of the standards underlines all the FSF's ethical elements.

While a local community is deemed a powerful actor in granting or withholding social license to operate aquaculture (Vince and Haward, 2019; Mather and Fanning, 2019), the Naturland and FOS standards do not emphasize avoiding negative impacts on communities that can substantially affect their certified farms from obtaining a social license. The FOS standard also ignores other aspects of indigenous peoples and local communities, evincing its least alignment with the FSF. Although negative impacts cause conflicts between farms and local communities that obstruct farms' efforts to build community relationships and social networks, the building blocks of the FSF's social capital, the Naturland and GlobalGAP standards are not interested in addressing these issues. Such disregard would restrain certifiers significantly from achieving faith in certification, public acceptance of aquaculture, and support from surrounding communities (Vince, 2018; Rector et al., 2023a).

Against the above backdrop, as the ASC and GAA-BAP standards tend to resolve conflicts and build relationships with communities, they appear to correspond better to the FSF's community-related issues than the other standards. These findings are consistent with Amundsen and Osmundsen (2020), showing that the ASC's community engagement requirements have made its certified salmon farms more attentive to maintaining relationships with local communities in Norway, Scotland, and Chile. This is because the ASC has faced obstacles in obtaining greater community support for its certified salmon farms such as Tassal, the largest salmon farm in Australia (Vince and Haward, 2019).

Farms' participation in community-based social institutions is a

prerequisite of the FSF; however, none of the six standards highlight this issue. Apart from the ASC shrimp standard, the other standards ignore the practice of employing a workforce from local communities, which is essential as lifting people out of unemployment and poverty is a precondition of community well-being according to the FSF. As in aquaculture, the MSC's fishery standard does not promote "sustainable livelihoods" for fisheries-dependent local communities, a constituent of the FSF's economic dimension (Foley et al., 2018). However, the findings concur with Rector et al. (2021), who argued that aquaculture standards pay the least attention to cultural services, notably social benefits provided by companies to communities. In sum, the findings reveal that the standards reflect the FSF's sociocultural constituents unequally. While the ASC and GAA-BAP standards appear relatively more suitable than those of Naturland and GlobalGAP in improving sociocultural sustainability, the FOS standard is extremely unsuited in this regard.

In addition to the variance of the standards in corresponding to the FSF's constituents, they (Naturland, GlobalGAP, and FOS) also differ by the exclusion of sociocultural issues, particularly forced labor, human trafficking, equality, fairness, harassment, community relationships and conflicts, and labor rights and freedoms (Fig. 1). Moreover, none of the standards (which are used in certifying farms in the global south⁵) explicitly consider several crucial social problems prevailing in the south that include land grabbing, marginalization, forcible eviction, and dispossession of poor peasants (Adnan, 2013; Afroz et al., 2017). These standards also disregard the well-being and interests of smallholders (Saha, 2022) subjected to exclusion from the global seafood value chain (Pauwelussen and Bush, 2020), who face food insecurity and poverty (da Silva et al., 2020) and financial constraints in terms of adopting advanced production technologies (Yi et al., 2018) and deem transnational eco-certification schemes "very expensive" (Schouten et al., 2016). Moreover, the ASC and GlobalGAP standards are unviable for smallholders owing to strict sustainability criteria and high transaction costs (Marschke and Wilkings, 2014).

In addition to the standards, the FSF's sociocultural dimension also fails to address the above crucial aspects, although the framework has been used to assess aquaculture eco-certification schemes such as the ASC (Mussells and Stephenson, 2020). Furthermore, several social problems of aquaculture identified are also evident in fisheries sectors of developing countries that particularly include human trafficking, forced labor, child labor, forced evictions, violence, unsafe working conditions, and killing (Ratner et al., 2014; Yea, 2022). Although such issues are key barriers to achieving social sustainability in fisheries including aquaculture, the FSF's sociocultural dimension disregards them as pressing concerns. The unintended exclusion of these issues presumably occurs due to its narrow focus on sustainability in Canada's fisheries alone, as highlighted by Stephenson et al. (2019). Not only the FSF but also other frameworks (e.g., Garcia et al., 2000; Anderson et al., 2015; Kinds et al., 2016) fail to underline such crucial aspects of sociocultural sustainability in fisheries.

Although identifying the FSF's gaps falls beyond the scope of this paper, it is still vital given the excluded items' decisive role in a comprehensive understanding of the sociocultural sustainability offered by the CFRN. Owing to the FSF's increased appeal to assess sustainability in fisheries and aquaculture, it is essential to improve and amplify the scope of its sociocultural dimension, which can extend the FSF's application to other sectors and ensure more "social benefits" for diverse actors seeking to integrate this framework (Parlee et al., 2021). Further improvement can potentially consider, for example, the excluded items (identified above), indigenous peoples' rights, impacts on and conflicts

with communities, interests of small-scale producers, employment contracts, and labor rights. The broader emphasis on cultural and ethical constituents would also expand the FSF's breadth given the ongoing difficulties in applying the framework to examine sociocultural sustainability in aquaculture certification standards.

Additionally, it is essential to consider crucial sociocultural issues that are currently excluded from and thinly highlighted in six standards to ensure the inclusiveness and wider acceptability of these standards. Although such improvements can halt criticism around sociocultural sustainability's marginalization in aquaculture certification standards, it rarely warrants addressing sociocultural challenges to sustainable aquaculture production. This is largely due to these standards' particular goals of increasing producers' access to international seafood markets (Samerwong et al., 2017), benefiting large farms by generating higher revenues (Henson et al., 2011), and serving the developed world's consumer and business interests (Gonzalez and Nigh, 2005; Vormedal and Gulbrandsen, 2020). This is also because certification agencies often weaken their standards' principles. For example, the ASC has diluted the strict environmental requirements of its salmon standard to serve business interests, resulting in a failure to address environmental problems, the withdrawal of nongovernmental organizations' support for the standard, and low interest from retailers in using and investing in the ASC logo (Gulbrandsen et al., 2022). Notably, there is growing uncertainty around whether the ASC, GAA, GlobalGAP, and FOS standards are capable of generating positive social (and environmental) outcomes given the challenges that these standards face to define sustainability, support continual advancement, measure aquaculture effects, and recognize local circumstances (Rector et al., 2023b).

6. Conclusion

Transnational certification standards offer a nongovernmental governance pathway to address sociocultural challenges to sustainable aquaculture development and govern aquaculture sustainably. By examining the principles incorporated in aquaculture certification standards and comparing these principles with the FSF's sociocultural dimension, I contribute to the existing scholarship in terms of whether these standards are well suited for addressing the evolving obstacles to achieving sociocultural sustainability in aquaculture. Although the examined standards are deemed to improve sociocultural sustainability in aquaculture, I found that, overwhelmingly, these standards focus on ensuring the workforce's health, safety, and well-being, whereas the emphasis on advancing producers' ethical practices and resolving crucial issues that affect indigenous peoples and local communities negatively is relatively minimal. Additionally, the Naturland and GlobalGAP standards are comparatively weaker than the ASC and GAA-BAP in terms of improving sociocultural sustainability. Although the FOS is one of the lead certifiers in international farmed seafood markets, its commitment to improving sociocultural sustainability is the most fragile given its lack of conformity to the FSF's sociocultural constituents. In addition, the standards are not identical as they neither reflect the FSF's sociocultural sustainability constituents equally nor set principles on all issues similarly.

While the standards overlap in articulating principles that result from standards' multiplicity and cause regulatory complexity, compliance problems, and trade barriers (Fiorini et al., 2019), they pay negligible attention to minimizing community impacts, resolving conflicts with communities, building community relationships, checking for human trafficking and harassment, and ensuring nonexploitation, appropriate disciplinary practices, and labor rights. These standards also disregard burning issues, particularly the marginalization, forcible eviction, dispossession, and displacement of poor farmers and resource users as well as smallholders' well-being. In addition to the standards, the FSF's sociocultural dimension is also silent about most of the aforementioned issues, precluding the framework's effective application in aquaculture. Such a negligible emphasis, coupled with the exclusion

⁵ In five eco-certification schemes, whereas the ASC (shrimp), GlobalGAP, and Naturland certify aquaculture farms in the global south, the ASC (salmon), GAA (salmon), and FOS certification services are highly concentrated in the global north (GlobalGAP, 2017; Saha, 2022).

of crucial problems, will undermine the standards' fundamental aims—the improvement and governance of sociocultural sustainability in the aquaculture sector. It will also impede the aquaculture eco-certification schemes' vision to govern farmed seafood production system in a socioculturally sustainable manner. Since the prioritization of these issues rarely warrants that standards will improve sociocultural sustainability in aquaculture given the multiple barriers identified previously, future research should explore how standards can overcome such obstacles to ensure sociocultural sustainability by better accommodating ignored aspects.

Author statement

I, Choyon Kumar Saha, am the sole author of this article. I have conceptualized, designed, analyzed, written, and revised this article. I am confirming that this article has not published and will not be published in any other publication outlets.

Declaration of Competing Interest

I have no potential conflict of interest with any institution and individual.

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