

**FAO Global Conference on Aquaculture 2020
Shanghai, September 2021**

Session on social and human dimensions of aquaculture
(24th September 2021)

Title of the paper:

**Humanizing aquaculture development:
Putting social and human concerns at the centre of future aquaculture development**

Pre-conference version, 30 August 2021

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Members of the convening group would also like to acknowledge **Prof. Eddie Allison** (WorldFish, Malaysia)'s comments during an email discussion about the draft Shanghai Declaration, which were incorporated in the section on Indigenous Peoples. They would like to thank **Dr Ruth Gomez-Garcia** (FAO Consultant / SPC) for her assistance in compiling all the feedback.

Abstract

Comparatively with other sector-specific issues, human and social dimensions in aquaculture are lagging behind. Sectoral, policy and programmatic factors and patterns have created inequities and weak outcomes, which are jeopardizing the contribution the sector could make to human wellbeing.

Human rights in aquaculture are at the core of this paper, which argues that aquaculture development needs to be about human development. The paper reviews “issues”, i.e. the application human rights in aquaculture, and related right to decent work, the notions of justice and equity (including the idea of blue justice and its relevance in aquaculture), ethics and social licence to operate (with the challenges that business ethics and public acceptance pose to the sector). It also reviews how these issues affect “people”: women (along with slow progress in gender equality in the sector), youth and their engagement in aquaculture (noting that ‘youth’ does not equate ‘jobs’ and requires the lifting of many more societal hurdles for their full participation in the sector), Indigenous People and local ecological knowledge – a precious asset for future aquaculture as well as the survival and enhancement of the cultural value of aquaculture, and people with disabilities (and other minorities) who have yet to become fully visible and accounted for in aquaculture development.

Redressing human and social issues in aquaculture, and placing people at the centre of aquaculture development, require a fundamental change from business as usual. To humanize aquaculture development, a new human relationship with aquaculture is proposed, founded on the recognition of substantive equality and agency, the embracing of intersectionality and the value of cross-disciplinary knowledge systems, and implemented through new, inclusive, business models, social provisioning approaches and procedural justice and governance mechanisms enabling to overcome inequalities, where public, private and non-state actors are involved, and inclusive of small-scale farmers, women, youth, people with disabilities and indigenous communities as key groups.

Key messages - social and human issues in aquaculture

Message 1 – Neglected social and human dimensions

Fundamental social and human dimensions are not making it in aquaculture development.

Message 2 – Transformation

A transformation of the aquaculture sector is required, i.e. a move away from business as usual towards a new human relationship with aquaculture aligned with human wellbeing concerns and greater contribution to the human development goals.

New modes of operating, e.g. inclusive business, need to be found, that better connect small-scale and larger scale players throughout the value chains and redress imbalances of power.

Aquaculture is a sector of great complexity, acting on one human dimension will have impacts on others (positive and negative) because of all the interconnections that exist across social and human dimensions and across multiple players. The challenge will be to ensure an overall desirable outcome.

Message 3 – Human rights and equity

The consideration of human rights (including labour rights), justice and equity in aquaculture should become a priority for the development of the sector in the next decade.

Message 4 – Certification

Certification, eco-labelling and tracing systems should be reviewed and expanded upon to better cover social and human issues, both in terms of content and process, and at more nodes in the chain because they could potentially be a key tool in helping address them if it is ensured that they are not excluding and that their impact is detrimental to smaller farmers.

Message 5 – Diversity of players

The aquaculture sector involves a wide diversity of players: women, youth, Indigenous Peoples who need to be adequately recognised and represented in policies, guidance and analyses. Intersectionality – the consideration of how gender, race, ethnicity, age interact and intersect with other social markers such as wealth, age, religion and/or other social characteristics, is fundamental in this endeavour.

Message 6 – Research

More research, including trans-disciplinary research, needs to be funded to fill knowledge gaps, to document human dimensions in aquaculture and propose changes to the status quo (solutions). Efforts need to be made to attract a greater number of social scientists in aquaculture research.

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Introduction

Human dimensions are found both upstream and downstream of aquaculture production in the value chain, and they are connected across the various stages of aquaculture products' life stages. This paper takes a value chain perspective on the human issues that affect the sector. Gender, youth, human rights, decent work, ethics and social license to operate, resilience, equity and benefit sharing, justice, inclusive business, indigenous peoples and knowledge are the key human dimensions reviewed and discussed in this paper. The realisation of each of these human dimensions is a building block towards greater human wellbeing: their consideration is essential to “humanise” aquaculture and to firmly anchor the sector on a sustainable and equitable development path.

Our reflection is guided by the following question: To what extent are human dimensions in aquaculture addressed, why, and where are the priorities for the next decade to change business as usual and to put human wellbeing at the centre of the sustainable development of the sector? While improved diets and nutrition through the consumption of aquatic foods constitute an important dimension of wellbeing, they are the subject of another thematic review and not included in this paper.

By their nature, many of the concepts and human issues presented in this paper are fluid, overlap and cannot be discussed in isolation from one another. After briefly reviewing the history and outcomes of the consideration (or lack of) of human and social dimensions in aquaculture (section 1), we delve into each one of them and examine the extent to which they have been taken into account in the development of aquaculture (section 2). In section 3 we suggest a way forward to overturn their neglect and bring human and social dimensions to the forefront of the agenda for sustainable and equitable aquaculture development. We end with key messages to move into a new era of humanised aquaculture development.

This paper should be seen as “think piece” that attempts to fill a gap and highlight, for the first time and as holistically as possible, the range of social and human issues that have so far escaped the limelight of aquaculture development. As the reader will see, their complexity, linkages and depth would require further elaboration which would be beyond the reasonable length of this paper. We therefore hope that the food for thought proposed here, including the approach to move the sector on a more humane and people-centred track, will not only benefit from further discussions and feedback from the Conference itself, but also evolve over time to acquire the weight, visibility and buy-in required to move aquaculture development beyond business as usual.

1. Current status of social and human issues in aquaculture

1.1 Evolution of human concerns in aquaculture since the Kyoto conference on aquaculture

When it comes to human concerns in aquaculture, a slow evolution of the narrative for aquaculture development since the 1976 Kyoto Conference can be noted (Box 1). The declaration of the first global conference on aquaculture in 1976 in Kyoto mentioned “people” four times, but “women” not once. The 2000 Bangkok Declaration, and the strategy that supports it, remains biotechnological in focus: “people” are mentioned about five times, but “women”, “gender”, “youth” not once, although the role of aquaculture in human development and social empowerment is acknowledged. The discrepancy in attention to social and human issues in aquaculture development is somewhat at odds with international development objectives and the concerns for

poverty alleviation and social equity of the time: the Millennium Development Goals had just been signed in 2000, and the fourth Beijing Conference on Women in 1995, had called for women-friendly policies and measures for women in fisheries, aquaculture and farming and for empowering them with access to resources and institutional services.

Box 1: Past global aquaculture conferences' calls at a glance.

1976 Kyoto: call for integrating aquaculture into rural development

2000 Bangkok: call for improving food security and poverty alleviation through aquaculture; integrating aquaculture into rural development

2010 Phuket: call for a more accurate assessment of economic and social contributions; intensify assistance to small-scale farmers; support gender-sensitive policies and implement programs; special emphasis on Africa.

While the 2010 Phuket declaration re-affirmed the relevance of the 2000 Declaration and Strategy, it reconnected more closely with global trends. Notably, it referred to the importance of considering gender in aquaculture development for the first time (paragraph 5), but was silent on youth, and on the contribution of aquaculture to human wellbeing more generally, aside poverty reduction and food security. Social resilience of aquaculture systems and social responsibility (of producers) are mentioned in passing among additional considerations to further the implementation of the Bangkok Strategy. Thus, despite some evolution and increased recognition over the last two decades of the social and human aspects associated with aquaculture development, the extent to which these dimensions actually influence the development trajectory of the sector, and reciprocally how aquaculture impacts on human wellbeing, are still very unclear because evidence is not systematically collected and impacts not monitored, leaving one to wonder what progress and changes have actually happened on the ground. Global milestones such as the SDGs and the call for leaving no one behind, the Paris Agreement on Climate Change - to cite only the most widely known – and global initiatives towards sustainability (e.g. UN Forum for Sustainability Standards) have since recognized that overcoming social and gender inequities and inequalities that are built into food systems are critical to the success of transformations to both sustainability and food & nutrition security, and to greater equity in development more generally. While this influence is starting to be felt in relation to other sectors (e.g. agriculture, capture fisheries), the concept of human wellbeing and equity remain largely ignored in aquaculture development discourses.

1.2 Insufficient focus on human wellbeing in aquaculture development weakens the outcomes of aquaculture

Aquaculture has the ability to support meeting the demand for feeding the world through increased food supply, nutrition and food security, as well as providing jobs and income generation (FAO 2016a). However, despite instances of positive social and human impacts, it also has a known history of negative impacts, documented mostly in the context of unregulated and fast expanding forms of intensive aquaculture, such as shrimp and salmon farming (e.g. Brugere, 2006, Barrett et al. 2002). While important advances have been made to curb these over the last three decades, notably through policy and legal actions (e.g. Bangladesh's 2014 shrimp policy restricted land grab and encroaching for shrimp farming – Haque 2015; India's Supreme Court recognition of shrimp farm encroachment on the fishing grounds of small-scale fishers in 1996 – Brugere 2006), equity concerns remain (Saha 2017) and many underlying issues in improving people's lives and 'leaving no-one behind' have remained unaddressed, and considerations of human and social

factors are still lagging. This could be due to social scientists and social sciences' late entry on the aquaculture scene (impeded by lack of awareness and investment in social/gender capacity in the sector and research and innovation including in policy and extension), to the scant attention to human behaviour in contributing towards increase in farm productivity, and to fact that (as a cause or consequence) "social and cultural aspects of aquaculture production have taken a backseat compared to trade, technology and biological implications" (Krause et al. 2020). These underlying institutional and sectoral factors have compounded to create weak, uneven or even perverse outcomes of aquaculture expansion, such as unequitable benefits (e.g. displacement, lost livelihoods), exploitation and human abuses, indecent work conditions and contested developments, which are explored in the next section. These have remained largely under the radar, despite the sector growing at an enviable rate and generating ever more food and more jobs.

The very nature of aquaculture development has also changed. Traditionally aiming to produce fish to feed the human population, its focus has shifted to economic profit and environmental impacts. With regards to the former, aquaculture (and fisheries) is becoming commoditized to produce more and cheaper products, creating challenges for sustainable production and equitable access (Belton et al. 2020). As for other economic and agri-food sectors, benefits of aquaculture are typically measured in terms of income, GDP, foreign exchange generated, yields, employment created (Murekezi et al. 2020). These indicators fall short of reflecting the non-economic value of aquaculture on individual lives, communities and societies at large. Thus, measures taken to curb negative impacts have been directly motivated by maintaining producing countries' market access through demonstration of product quality, e.g. respecting sanitary regulations for exporting countries, but not necessarily by complying with standards of human and social welfare. With a focus on food safety and environmental safeguards, most current aquaculture standards and certification schemes remain weak in addressing human welfare, equality and decent work issues, and compliance may only result in context-specific welfare improvements (Kruijssen et al. 2021). Furthermore, their reductionist nature also means that they often fail to encompass the human complexity that makes the value (beyond \$) and resilience of traditional aquaculture systems and value chains (Mialhe et al. 2018).

Only a change in these underlying sectoral, policy and programmatic factors and patterns will help reduce the gap in who benefits from aquaculture. This change is both needed and urgent to effectively push forward a new agenda and trigger changes in minds and behaviours, and before negative impacts on human wellbeing become irreversible, or reversible in the longer run at a very high cost to society as a whole, e.g. health impacts from poor work conditions on fish farms.

1.3 Climate change and pandemics: a backdrop challenging further human vulnerability in aquaculture

Climate change is putting the resilience of current aquaculture systems (production and value chains) to the test and the COVID-19 pandemic has been exacerbating vulnerabilities and inequalities in food systems, including agriculture-based. For fish farmers, adapting to climate change and other drivers of change is determined in large part by their wealth (Ferdous Hoque et al. 2018) so there is a risk that the gap between those who can adapt and those who can't will widen. Policies for aggregate growth or even adaptation that do not take into account the heterogeneity of aquaculture producers, especially small-scale ones, can have damaging effects (Short et al. 2021) and thus may undermine the resilience of all aquaculture-based livelihoods and economies (Ferdous Hoque et al. 2018). While aquaculture may contribute to resilience through diversification of livelihoods and food systems (Troell et al. 2014) as an alternative to

over-exploited wild fisheries, as a sustainable source of income for poor households, and as a way to enhance health through increased consumption of fish (Mills et al. 2011), it can also lead to more inequalities and instability by increasing the privatization of common resources (ibid).

The Covid-19 pandemic is further exposing the vulnerability of the people who work and depend on aquaculture. As it is still unfolding, it is showing how, across high- and low-income countries, some seafood supply chains, market segments, and companies have been more resilient than others. For example, frozen Ecuadorian shrimp and Chinese tilapia exports have been more resilient than live-fresh supply chains (Love et al. 2020). However, the informal farming sector has been particularly challenged in many countries (ibid). For example, in Bangladesh, the closure of shrimp export markets, coupled with a natural disaster, has had disastrous impacts on small-scale shrimp farmers' livelihoods (The Guardian, 08 February 2021). The pandemic has also been particularly harmful for fish migrant workers, including those working in aquaculture (Marschke et al. 2021), who, like many small-scale farmers have few means to recover from such shocks. The pandemic is emphasizing the importance of resilience over efficiency: aquaculture systems need to be able not only to withstand shocks, but also bounce back better (from a human point of view). Short-term coping and adaptive measures therefore need to be taken forward into building more robustness to future shocks and address concerns related to social equity (Love et al. 2020).

The toll of combined climate change and the pandemics has been particularly heavy toll on aquaculture systems that hinge on social and human weaknesses, de jure or de facto, and has been disproportionately affecting the more vulnerable groups involved in these systems – small-scale farmers, fish migrant workers, women fish factory workers etc. This further demonstrates why addressing human and social dimensions of aquaculture production and value chains is critical and worthwhile to build resilience to shocks and capacity to adapt to climate change.

It is too early to say which of the inner characteristics of aquaculture systems will facilitate recovery from the pandemic. Negative coping strategies, such as increases in child labour are already being witnessed (D'Andrea, pers. comm.). They are not only plunging some households into further destitution but also constitute an important set-back for the sector as whole, all the more so that mechanisms facilitating recovery, such as compensations in case of shocks (social protection) or access to assets insurance are rare in aquaculture (van Anrooy et al. 2006).

2. Issues and challenges

In this section we review, in turn, the issues that have been around, and those that have more recently emerged, in constraining aquaculture's contribution to wellbeing. We start with the broader issue of human rights, as it underpins issues of justice, equity, decent work and ethics, and how these play out on women, youth, indigenous peoples and disabled people (Figure 1).

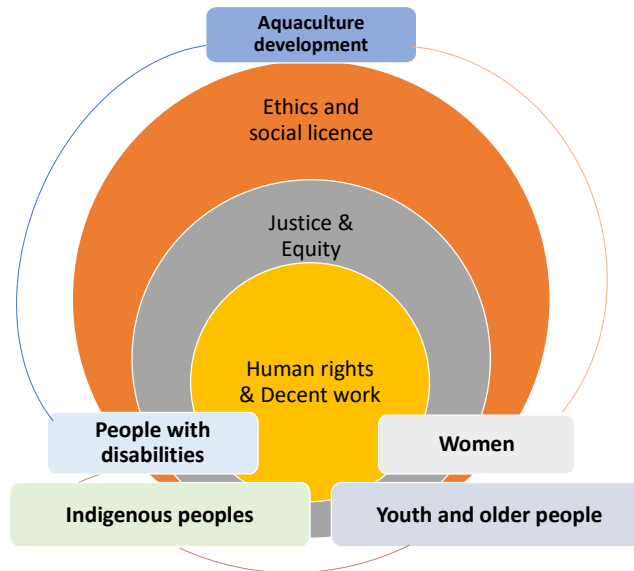


Figure 1: The nesting of social and human issues in aquaculture development.

Note: Ethnicity, gender, age and disability intersections across the four groups indicated in the figure (boxes). Equally, issues indicated in circles interplay with one another.

Many of the issues highlighted in Figure 1 have made important headways in capture fisheries, and the narrative about fisheries sustainability, governance and benefits has been fast changing as a consequence (cf. Bennet 2018, Allison et al. 2020, Österblom et al. 2020). Such signs of change are not yet visible in aquaculture. Lessons can be learnt from capture fisheries about its role as a public goods provider, and it is becoming more pressing for the aquaculture sector to go beyond sole private interests to address broader human and social issues and deliver on the SDGs because aquaculture can (but not automatically) provide more than food or income. Profits, production and food security and food supply objectives still stand, but they are no longer sufficient nor satisfactory on their own.

2.1 Issues

2.1.1 Human rights and decent work

a. Human rights

Human rights are rights every human being has because of their existence. Box 2 outlines what human rights are, why they are important, and how they are safeguarded.

Box 2: What are human rights and why they are important.

Fundamental human rights. Human rights are universal, they are not granted by any state, and are inherent to all, regardless of nationality, sex, national or ethnic origin, colour, religion, language, or any other status. They range from the most fundamental right, the right to life, to other rights such as the rights to food, education, decent work, health, and liberty¹. The Universal Declaration of Human Rights, adopted by the UN General Assembly in 1948, is the legal document that sets out these fundamental rights. Together with two other covenants, the International Covenant for Civil and Political Rights, and the International Covenant for Economic, Social and Cultural Rights, these are the International Bill of Human Rights (OHCHR website 2020). States have the primary obligation and duty to ensure that human rights are respected, protected and fulfilled. With regards to gender equality, the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) is the main instrument to promote and protect women and girls' rights; it is monitored by the UN Human Rights Office of the High Commissioner (OHCHR).

Decent work. All workers have a right to decent work, in both formal and informal sectors. Decent work has been defined by the International Labour Organization (ILO) as being productive work for women and men in conditions of freedom, equity, security and human dignity. Decent work involves opportunities for work that is productive and delivers a fair income; provides security in the workplace and social protection for workers and their families; offers better prospects for personal development and encourages social integration; gives people the freedom to express their concerns, to organize and to participate in decisions that affect their lives; and guarantees equal opportunities and equal treatment for all women and men (JIU 2015: 4).

Human rights and the private sector. Since the 1990s, there has been an increasing notion that besides governments, other actors, including the private sector, have an important role to play to ensure that human rights are not infringed. Due to globalization, companies have been having adverse impacts on workers, communities and consumers. To address this, after many years of development and consultations, in 2011, a non-binding framework, the UN Guiding Principles on Business and Human Rights (UNGPs) were unanimously adopted by the UN Human Rights Council. The Principles provide the first global standard for preventing and addressing the risk of adverse impacts on human rights linked to business activities (OHCHR 2011). Besides spelling out the duty of states to protect against human rights violations by the private sector, this framework provides guidance to companies regarding their responsibility to respect human rights (so-called human rights due diligence) and to provide remedy to those adversely affected by their activities. This framework, though not legally binding, has been widely accepted by companies and other stakeholders globally and companies have started to implement these principles. While the UNGPs are not legally binding, there is more understanding that there is a need for legislation to require companies to respect human rights and undertake human rights due diligence. France has the Duty of Vigilance Law, the Netherlands has approved child labour due diligence and the UK has the UK Modern Slavery Act, all examples of laws that mandate companies to practice human rights due diligence by law (Business and Human Rights Resource Centre 2021). At the EU level, the European Commission committed to introducing rules for mandatory corporate environmental and human rights due diligence in 2020 (European Parliament 2020). These developments will affect seafood production in these countries and the EU as well as import of seafood produced through aquaculture into the EU.

¹ These rights are *substantive rights*, and differ from *procedural rights* (governance-related) rights, such as the right to informed consent. While both are inseparable.

Human rights as a framework or specific lens to identify and document impacts in the aquaculture sector is still largely absent. In capture fisheries, human rights issues have been of concern for some time (Gry Friday Hansen et al. 2020, FAO SSF Voluntary Guidelines 2015, FAO 2007) and exposed in both the literature (e.g. Lewis et al. 2017) and the media. In the past decade, human rights and labour impacts have been exposed and discussed even at high-level intergovernmental meetings (Lewis et al. 2017, ILO 2015, ILO 2016, FAO 2019, FAO 2017a, FAO 2017b), focusing on, for example, slave labour like working conditions in the Thai fisheries sector (Human Rights Watch 2018), human trafficking and forced labour in the Indonesian fishing industry (IOM 2016), lack of social safety nets for migrant labourers in marine capture fisheries in India (Lekshmi and Johnson 2013) and the human rights implications of illegal, unreported and unregulated (IUU) fishing (Fishwise 2018) as well as their links to fish trade.

When it comes to human rights in the aquaculture sector, there has been a slight shift from focus on only environmental issues to inclusion of social issues. For example, organizations traditionally working on environmental conservation of sectors such as aquaculture have moved their focus to responsible production and social issues (e.g. WWF as per its website). However, attention has been primarily focused on working conditions (example of the Bangladeshi shrimp sector, Solidarity Centre 2008, EJF 2014) and on labour rights (example of the Vietnamese seafood/aquaculture sector). While, compared to capture fisheries, collective human rights received little attention, it is worth flagging that aquaculture activities are increasingly spreading over waterbodies that are common property resources (and managed as such) where human rights aspects of tenure play a part, and that feedback between environmental degradation and human rights need to be accounted for (Lewis et al. 2017).

Human rights violations relate directly to forced labour, child labour, debt bondage, discrimination, denial of rights of association, and a lack of collective bargaining and labour agreements. They are also related to the impact of external factors, such as pollution and ground water contamination, which adversely affect the human rights to life and water and to a clean environment. The concept of child labour is used in relation to work that is prohibiting compulsory schooling or that is damaging to children's health and personal development (Franz et al. 2015, FAO and ILO 2013). While children helping on fish farms and related activities is commonplace and may be acceptable if tasks performed are not hazardous and do not interfere with education (FAO and ILO 2013), child labour and employment of underage migrant workers in processing factories are common occurrences (EJF 2003 cited in FAO and ILO 2013, The Asia Foundation and ILO 2015). In the shrimp industry, the informal nature of children's work, compounded by the fragmentation of the sector, means that it is difficult to regulate and inspect (Asia Foundation 2015). Child labour in aquaculture not only contravenes to ILO Conventions, international human rights standards and national laws, but also bears adverse social and educational consequences on the prospects of this youth (FAO 2010b). FAO has put forward a framework for ending child labour in agriculture, which proposes entry points for eradicating child labour in fisheries and aquaculture (FAO 2020a).

While the impacts of aquaculture go beyond working conditions and labour rights, there has been much less focus on wider human rights impacts such as impacts on communities, in particular indigenous communities and small-scale producers, on women, or on issues related to transparency and ethics. Arengo et al. (2010) is one of few exceptional studies on labour as well as community impacts of the salmon farming industry in Chile, Canada and Norway. Greenpeace (2008) investigated the wider human rights impacts in aquaculture globally, including issues related to human rights defenders opposing aquaculture projects, as well as impacts on public health due to use of high levels of antibiotics. These reports are however over a decade old, and few studies of this kind have been carried out since. A recent impact assessment by the Chilean

National Human Rights Institute and the Danish Institute for Human Rights (INDH and DIHR 2021) has gone further and is the first of its kind to have assessed the adverse impacts of the salmon farming sector in Chile through a human rights lens. Through desktop research and field-based interviews with company managers, government representatives, workers, unions, community representatives, academia, NGOs and others, the study looked at the impacts of the sector on labour rights of workers across the value chain, community impacts including indigenous peoples and the human rights consequences caused by environmental impacts. A general assessment on human rights in the salmon farming industry was discussed in 2019 (DIHR, Rafto Foundation & IHRB 2020)

The aquaculture sector is increasingly reliant on seafood certifications such as Aquaculture Stewardship Council (ASC), Global GAP and Best Aquaculture Practices (BAP), which enable producers to demonstrate commitment to responsible farming practices, while gaining greater market access (FAO 2018). From an initial focus on environmental issues, these schemes have evolved to embrace some social issues, albeit slowly or superficially. Their focus has remained on labour rights and not so much other human rights issues. Whilst ASC includes in its certification standards a number of criteria related to community impacts and indigenous peoples (ASC 2019), and the newly revised BAP Farm Standards (BAP 2021) encompasses gender considerations for the first time, compliance is not even, and as a consequence, social impacts are still uncertain (Kruijsen et al. 2021). In terms of the process of how certification audits are carried out, these also have limitations from a human rights perspective, due to the fact that certification audits focus more on management systems, and they are snapshots in time. With limited time spent on the ground to engage with those who are or could be affected, coupled with often limited human rights expertise by auditors, such certifications do not always allow for a thorough assessment of root causes of the social and human rights issues in the industry. Furthermore, the intermittent nature of audit type arrangements is prone to "Potemkin Village" type presentations or façades by the firms in order to satisfy the audits. However, despite these limitations, certification schemes could have the potential to assess and address the social and human rights issues that exist in the sector at farm and processing level (INDH et al. 2020), provided that they do not constrain farmers', especially the smallest ones', capabilities to comply (Samerwong et al. 2020, Mialhe et al. 2018) and that there is genuine collective action by the workers organising and speaking on their own behalf.

Independent, holistic, evidence-based research is still lacking to assess and measure what the social and human rights impacts of aquaculture production systems are on workers, communities and consumers, in different contexts. No government, aquaculture producer, buyer or certification standard can address the human rights impacts of the sector alone. This has to be a collective effort, starting with aquaculture companies' committing to respecting human rights, by committing to the UN Guiding Principles on Business and Human Rights and training staff to better understand what human rights mean in their operations. Furthermore, there is need of going beyond certification and conducting human rights impact assessment (DIHR 2020) to assess and address negative impacts, involving and respecting workers' representatives and their associations and unions and being transparent about human rights issues in the sector. For aquaculture businesses to be able to do this, guidance is required on how to assess and address the human rights impacts of their activities and answer questions such as: what are the human rights issues beyond those generally known, such as labour conditions in shrimp farming, woes of women farmers in the seaweed farming sector in India, or other production systems and value chains?

Governments of countries where human rights are an issue should consider including the aquaculture sector in their human rights and business legal and public policy efforts, such as in

the development of so-called National Action Plans on Business and Human Rights. International buyers could require from aquaculture companies to abide by international human rights standards rather than national laws if these are weaker. The EU has recently released its Code of Conduct for Responsible Business and Marketing Practices, which is a relevant development in this regard for international value chains (EU 2021). Lastly, certification standards could consider applying a human rights-based approach to certification audits so that certification can become a genuine tool to detect human rights violations rather than being a checkbox exercise to obtain an eco-label or certification.

b. Decent work

The four pillars of decent work are: (1) employment creation and enterprise development; (2) social protection; (3) standards and rights at work; and (4) governance and social dialogue. They have been endorsed by the international community and enshrined in Agenda 2030 and its SDGs, notably Goal 8, which focuses on decent work and economic growth, and has as a goal to promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (United Nations 2015). There are four categories of labour rights: freedom of association and the effective recognition of the right to collective bargaining, elimination of forced or compulsory labour, abolition of child labour and elimination of discrimination in respect of employment and occupation (ILO 1998).

Full and productive employment and decent work are a mainstreamed objective across the UN organizations system (ECOSOC 2008, JIU 2015). The ILO, tasked to ensure that the decent work agenda and the core labour standards contained in the Declaration on Fundamental Principles and Rights at Work are promoted, protected and respected at a global level (ILO 1998), is currently undertaking work to promote the decent work agenda in aquaculture. For example, it is planning to hold a technical meeting on the future of work in aquaculture in the context of the rural economy with the aim of adopting conclusions, including recommendations for future action (ILO 2020). FAO also has ongoing activities on decent work and employment in aquaculture, including a scoping study that was conducted on the issues related to the sector (FAO 2015b, FAO 2016b).

However, despite these high-level commitments, decent work and respect of labour rights are still given insufficient attention in aquaculture, if not denied all together. There has been a false assumption in the previous Aquaculture Declarations that small-scale aquaculture production would solve social and human welfare issues, when in fact, medium scale and large-scale enterprises have borne a heavy influence on social and human outcomes, throughout value chains and trade, not just production, and the small-scale, informal, sector, is anything but exempt from infringements to decent work and labour rights, as described below.

Decent work includes **occupational safety and health aspects**. In the aquaculture sector, they are neglected in most countries and at a global level. This is resulting in a high incidence of work-related injury, disease and sadly, fatalities for workers in all segments of the sector (Ngajilo and Jeebhay 2019, Mitchell and Lystad 2019, Cavalli, Waterson and Marques 2019, Holmen and Thorvaldsen 2018, Fry et al. 2019, Kaustell et al. 2019, Cavalli et al. 2019, Fröcklin et al. 2012). The high rate of injury, fatality and occupational disease in the sector is related to a combination of the vulnerability of many aquaculture workers and poorly controlled multiple hazards such as exposure to physical, biological, chemical, or ergonomic and safety hazards (e.g. water impoundments, transportation, shift and night-time work, offshore operations, heat and salt exposure). Low wages, insecure work, limited housing options in remote areas and poor access to healthcare and transport are other contributing issues. This level of concern is in stark contrast with aspects such as food safety and quality, sustainability and environmental impacts often

highlighted as important by industry platforms and governments (Watterson et al. 2019, FAO 2021).

Exploitation and violence against women are also encountered in the aquaculture sector, infringing both human rights and international labour standards. For example, acts of sexual violence towards women, limited freedom of movement of workers, withholding of and low wages, as well as lack of grievance mechanisms and hazardous working conditions have been exposed in shrimp farms and processing industries (Vérité 2016, Economic Research Group n.d.). In the salmon farming industry, long working hours and sexual harassment, lack of respect for maternity rights and impacts on the right to family life due to night shifts, have also been reported (INDH et al. 2020). Social customs and societal pressures as in India, overshadows the integral role played by women in fish processing sector (Gopal et al, 2020).

Even where labour regulations to help ensure decent work exist, they are often not enforced and expose **migrant workers and children** in particular to decent work and labour rights infringements. In general, because of their vulnerable state and lack of leverage, migrants for employment face additional threats to decent work, such as deception, discrimination, restricted freedom of association, forced labour and occupational health and safety concerns (FAO 2016b, ILO 2017). Frequent occupations of children include feeding and harvesting fish in aquaculture ponds, and post-harvest activities like sorting, processing and selling fish, but because of their developmental status and lack of skills due to their young age, they are more prone to safety and hazard risks. These health risks add up to the fact that children who “help” their families in small-scale aquaculture farms are often also deprived of education (FAO 2010b). Furthermore, children of migrant workers, on the move, are at a higher risk of child labour, and migrant child labourers face a double whammy of deprivation (van de Glind and Kou 2013). Along the East Coast of India, for example, children are migrating to work onboard the fishing vessels (Roshan 2016). Economic necessities are the driving force attributed to this and more often the child migrants are confronted with health problems (ibid). In Thailand, child labour situations have been observed predominantly among migrant workers in small-scale informal enterprises processing shrimp and seafood (sorting, peeling, and deveining) (ILO 2012). Newly emerging competency-based education for child labour could hold potential for curbing child labour (Mathews, pers. comm.) and it will be interesting to monitor its implications in capture fisheries and aquaculture.

Instances of labour rights infringements and substandard working conditions are rife and can be found in all parts of the aquaculture value chain, regardless of species and intensity of production. For example, in Bangladesh, they range from collecting shrimp larvae from wild stocks or from hatcheries to supply ponds to those working in processing plants (EJF 2016, Vérité, 2016, Economic Research Group, n.d.). In Chile, poor working and safety conditions for people employed in salmon farms and processing plants have been reported, including low wages, long working hours (Barrett et al. 2002). Safety records however vary across producing countries: while over 50 accidental deaths were reported between 2005 and 2008 in Chile, mostly among sub-contracted divers who are tasked to clean and untangle nets at huge depths (Greenpeace 2008), none were reported in the Norwegian salmon industry during the same period (INDH and DIHR 2021). More precarious working conditions in Chile also have to do with the fact that, there, the majority of workers are contract workers, while for example in Canada, most workers are permanent and full-time (Arengo et al. 2010).

Media attention on labour rights and decent work in aquaculture has increased with the revelation of numerous cases of labour rights violations in the seafood industry (Fishwise, 2014). The seafood industry and retailers, as a result, have felt a growing pressure from consumers to ensure decent work and fair labour standards for workers, in addition to environmental standards, are

respected. In spite of the efforts, challenges are significant because the aquaculture sector has a complex and long value chain involving many stakeholders (FAO 2020b). The informal nature of much of fish processing or pre-processing facilities often leaves these outside the scope of labour inspections (The Asia Foundation and ILO 2015).

Efforts to ensure the right to decent work for aquaculture workers are also constrained by the significant data gaps in knowledge, resources and monitoring of the industry (FAO 2017c). Due to poor collection and reporting, global data on worker injuries is lacking. Nevertheless, the available information reveals significant impacts including mortality from hazards and uncontrolled risks.

2.1.2 Justice and equity

a. Justice

Within justice – as in justice among people (i.e. “social justice”, which is what we are concerned with here), is enshrined the notion of distribution. Social justice is a politically-charged concept (UN DESA 2006): it provides “a framework within which relations between individuals and groups can be understood, assessed, and characterized as just or unjust” (UN DESA 2006: 12). At the same time, “there is clearly a universal dimension to social justice, with humanity as the common factor” (ibid). The notion of justice is one that has so far tended to be off the aquaculture development radar. Yet, it is a matter growing in importance.

Blue justice as a driver for equitable aquaculture

The concept of Blue Justice has been used in capture fisheries, not only in relation to tackling crime (e.g. <https://bluejustice.org>), but also, more philosophically, as a concept to identify links and dissonances between high-level, rights-based principles of justice (such as those contained in the FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the context of Food Security and Poverty Eradication), the interpretation and application of these principles at mid-level, such as governmental rules and laws, and the ways in which these manifest at community and individual levels in terms of values, norms and freedoms at lower level, which, if addressed, would improve the overall governance of small-scale fisheries (Jentoft 2020, TBTI 2018). At its core, Blue Justice encompasses social justice and human rights principles whilst being intrinsically tied to principles of environmental and climate justice. This idea, although still estranged in aquaculture, would resonate equally well with it: understanding the causes and reasons for the widening of the gap between these different tiers of justice would shine a light on the incoherences that are keeping open the “people-policy gap” (Krause et al. 2015) and preventing the more equitable development of aquaculture (Brugere et al. 2021).

Aquaculture does not have high-level guiding justice principles. It tentatively tries to hook on to the SDGs (cf. thematic paper on this topic), to very few, species-specific initiatives that made headways in the past regarding social responsibility (FAO/NACA/UNEP/WB/WWF 2006, FAO 1998, Barg et al. 1999) or to the past declarations of FAO Conferences on aquaculture. It is perhaps for this reason that justice in this sense has not been part of the aquaculture agenda. But as Jentoft (2020: 60) puts it: “justice principles are not sufficient to secure justice, but they are a yardstick for the evaluation of processes and outcomes, and may well provide a basis for litigation if gaps persist”. Bringing on board the blue justice narrative in aquaculture development is therefore all the more urgent, especially in coastal and marine areas, that the current push for the

development of blue economies/blue growth is gathering pace in many parts of the world and is becoming increasingly contested (Belton et al. 2020, Farmery et al. 2021).

Justice in aquaculture through legal recourse

Courts are the place where justice in aquaculture can be decided. When aquaculture operations have adverse human rights impacts on their own workers, on workers in their supply chain, on community members, consumers or others, they should provide them with access to justice, or support them to do so when language, lack of documentation or information can be a barrier (e.g. of migrant workers, ILO 2014). A framework and process exist for those who need to seek justice for a business' wrongdoings (Box 3).

Box 3: Framework and mechanisms to redress business-related grievances.

According to the framework mentioned in the sub-section on human rights, the UN Guiding Principles on Human Rights and Business (UNGPs), the authoritative framework on businesses' human rights impacts, both governments and companies should provide remedy to those who have been negatively affected by a form of economic development and/or its consequences. States should do this through judicial, administrative, and legislative means, including having adequate laws in place to hold companies accountable, for example through inspecting companies and imposing fines and penalties. States can also use non-judicial grievance mechanisms such as OECD National Contact Points. All governments adhering to the OECD Guidelines for Multinational Enterprises (OECD 2011) have established a National Contact Point (NCP). Affected persons who can demonstrate that the OECD Guidelines have been breached can file a complaint against a company, with the support of an NGO, to the NCP of the country where the company is domiciled. The NCP can then mediate between the company and the aggrieved party/parties (OECD 2019, 2020).

Companies should do this at the sectoral or individual company level through so-called operational-level grievance mechanisms. Such mechanisms should be accessible to workers, workers in the supply chain, communities and others who could be adversely affected, such as consumers. The mechanisms should fulfil a number of criteria, namely the 8 effectiveness criteria for operational-level grievance mechanisms (see OHCHR 2011, Pilar 3, principle 31, p. 33-35).

In practice, justice for those who are adversely affected by aquaculture developments is limited. A few cases have nonetheless set precedents for the sector, mainly in the salmon and shrimp farming and processing. In 2009, two NGOs filed a complaint on behalf of aggrieved parties against a salmon farming company alleging that they breached the OECD Guidelines for Multinational Enterprises. The company was accused of not adequately considering the rights of indigenous peoples in Canada and Chile whose access to resources was threatened by the company's salmon breeding. The company was also accused of carrying out unfounded dismissals, attempted prevention of free association of employees in labour unions, discrimination against women and implementation of inadequate safety procedures for its employees. It was also alleged that the company's activities posed an environmental threat through the spread of salmon lice and disease. The complaint led to a mediation process followed by a joint statement, in which it admitted to not having taken sufficient account of the precautionary principle in meeting social and environmental safeguards. The parent company also took responsibility for its subsidiaries' activities abroad. However, following this process, the complainants in Chile commissioned a study to assess if and how the company had addressed the complaints. This study concluded that the company failed to change its operations in Chile and that little had been done to improve the conditions of women and subcontracted workers at production facilities and communication with trade unions, nor had it convincingly addressed disputes with indigenous communities (OECD Watch 2009). This case demonstrates that the company did not adequately

change its practices and the situation for those that were affected did not improve. It shows that producing companies can take advantage of loopholes and that lack of enforcement is a weakness of the OECD NCP process (Khoury and Whyte 2019).

This type of violations has continued unabated, and has worsened in the context of the Covid-19 pandemic. In a recent case in Chile, during the pandemic, inspectors found that a security guard at a salmon farming plant had worked 46 days without electricity, drinking water, or access to a bathroom, which is a serious violation of labour and human rights (Cooperativa 2020). The company denied any wrongdoing and the security guard later retracted his statement. When the Labor Department became aware, they ordered the cessation of work at the salmon farm and levied a fine against the company and the farm's security contractor of an amount of 11 million Chilean Pesos (nearly USD 14,000).

At the company level, research in the human rights records of the salmon farming industry in Chile has revealed that access to remedy of those adversely affected is weak. Some companies have a grievance mechanism for workers or they can speak directly to their managers. However, in the cases of injuries, long-term health impacts or deaths of workers in the industry, compensation has been limited (INDH and DIHR 2021).

When it comes to impacts on communities, there were even fewer avenues to share grievances and to obtain access to remedy. According to independent research by WWF Chile, in Southern Chile communities are often unaware of the existence of grievance or conflict resolution mechanisms to address their grievances, and therefore they do not use them. WWF has recommended that communities are better informed about the existence and functioning of the conflict resolution mechanisms (Montenegro et al. 2018).

While it may be too early to assess the lasting impact of the Chilean court cases on working conditions and compliance with labour and human rights, it is also worth noting that some court cases have had positive outcomes and set the development trajectory of the sector on a more sustainable track. For example, the 1996 judgement of the High Court of India ruled in favour of small-scale fishers who had been ripped of their access rights to fishing grounds by shrimp farms within the Coastal Regulation Zone and ordered their destruction. This ruling led to the creation of the Aquaculture Authority of India (replaced in 2005 by the Coastal Aquaculture Authority) to regulate the development of shrimp farming and improve the overall governance of the sub-sector (Brugere 2006).

b. Equity

At FAO's 2010 Global Conference on Aquaculture in Phuket, equity was a theme cutting across several topics. Equity was proposed earlier as one of the four governance principles of sustainable aquaculture (along with accountability, effectiveness and efficiency of government activities, and predictability, Hishamunda et al. 2012) and as the core of Principle 2 of the Ecosystem Approach to Aquaculture ("Aquaculture should improve human well-being and equity for all relevant stakeholders". Soto et al. 2008, FAO 2010a). Equity has also been extensively considered alongside poverty alleviation (Little et al. 2012) and gender and women's empowerment (Williams et al. 2012) while recognising that equity outcomes from aquaculture are largely dependent on the prevailing market and governance structures for the sector (Little et al. 2012, citing Irz et al. 2007). Today, despite emerging guidance on how to make aquaculture development more equitable (Eriksson et al. 2018), the notion of "equitable aquaculture development" is still barely on the radar, although the notion of equity is growing fast in the context

of ocean governance (Österblom et al. 2020) and is an emerging question in Blue Economy narratives (Farmery et al. 2021).

2.1.3 Ethics and social license to operate

a. Ethics

Ethics in aquaculture is not a new topic. Its treatment and interpretation have evolved from focusing on animal welfare and use of genetically modified organisms in aquaculture (Millar and Tomkins 2007), to encompassing principles of wellbeing, autonomy and justice in their application to natural (incl. fish) and human (incl. government and future generations) systems (Lam 2016). Comparative analyses of the ethics of different aquaculture production systems are however few. Lam (2016) suggests that farmed carnivorous salmon would be less ethical than farmed omnivorous tilapia, in particular regarding autonomy and justice, but cautions that more in-depth studies are carried out and that ethical issues spill over the entire value chain, involving a complex interplay of institutions, actors and ethical issues (e.g. compliance, awareness, responsibility etc.). Ethical consumerism has arisen over the last 10-15 years (Verbeke et al. 2007), aided by a spur of market and non-market-based schemes and tools to guide consumers' choices for aquatic products (Lam 2016) and to increase consumer trust in seafood products (Banovic et al. 2019). The link between ethical beliefs, perceived product quality and value is strong: in Europe, Banovic et al. (2019) showed that consumers considered seafood production and supply ethics more important than quality and value, and that the former ultimately drove their purchase decisions. Reciprocally, one can raise questions about the ethics of manipulative communication about the safety of some fish products to increase (or reduce) their market demand (e.g. pangasius in Murk et al. 2018). Ethics has therefore important implications in terms of marketing, image and communication about aquaculture products.

In a business context, transparency, corruption, accountability and access to information are relatively new ethical considerations, notably in aquaculture. Context is important to acknowledge in business ethics, but while ethical values are somewhat culturally-embedded, they are also underpinned by universal principles (like justice) of what is good or bad for individuals, society and, by extension, corporations. As illustrated in Box 4, public scrutiny is increasing the pressure on large companies to be more open about their practices, with sanctions applied for real or perceived business ethics failings. A recent report found that existing transparency and accountability in salmon farming are “extremely weak” and that legislation is needed for the industry to meet higher standards (Just Economics 2021). However, whether salmon farming is an isolated case of breach in ethics, and the likelihood and frequency of these sort of breaches occurring in other forms of aquaculture systems, are currently unknown.

Box 4: Cases of breaches in business and production ethics in the aquaculture industry in Chile.

In Chile, in 2019, it was exposed by a journalist that a large salmon farming company had falsified its salmon mortality rates to hide true figures from the Fisheries and Aquaculture Service, the body that inspects the salmon farming industry. Three complaints were filed against the company in 2019 and in 2020 Chile's Council for the Defense of the State filed a criminal case against company executives for fraud (Seafood Source, 15 June 2020). The Aquaculture Stewardship Council ended its logo licensing agreement with the company and in July 2020, the company was fined USD 190,200, the maximum fine for falsifying mortality reports, although Chile's National Fisheries and Aquaculture Service, Sernapesca, will look to increase sanctions (Seafood Source, 10 July 2020).

Another case relates to transparency in the use of antibiotics by salmon farming companies. In 2018, on the basis of the Right to Information law, a Chile-based NGO requested the amount and class of antibiotics used per company and per farm, together with the biomass produced during the past three years. Of 24 companies, 18 refused to provide this information. The NGO appealed to the Council for Transparency, which determined that the information was of a public nature after which most of the companies complied with the ruling. Two companies appealed and refused to provide the requested data arguing this was commercial information, but this was rejected by the Council for Transparency (INDH et al. 2021).

Still in Chile, in 2019, charges were filed against another salmon farming company Nova Austral for falsifying the mortality figures of dead salmon and numbers related to antibiotic use in their operations.

b. Social license to operate

Social license to operate (SLO) refers to the ongoing acceptance of a company's business practices and operating procedures by its employees, stakeholders, and the general public. It refers to mutual respect, shared benefits and common trust between the company and the community it operates in and other stakeholders (RAIS 2014). Social license arose in the mining sector to improve relations between communities and extracting companies, and could inspire the aquaculture sector to follow suit (Mather and Fanning 2019). On account of its high frequency of occurrence in the literature of the last 2-3 years, in particular in the context of mariculture, it is becoming a fast-growing concern, although it was already mentioned in the 2010 Phuket Conference in relation to aquaculture governance: "Long-term prosperity is predicated on fulfilling the four prerequisites for sustainable aquaculture development: technological soundness, economic viability, environmental integrity and social license." (Hishamunda et al. 2012, p. 236). Today it appears to be very much driven by Western perspectives and interests.

The concept of social license to operate applies to both community acceptance, and to the broader acceptance among the public and consumers of aquaculture operations. An example of the issues the former raises is in the salmon industry in Canada. There, salmon farming has brought economic benefits such as job creation, but social license for salmon cultivation has been poor, in particular in British Columbia (BC). In the late 2000s, two major communities in BC stated that *'While aquaculture provides jobs and millions of dollars of revenues, there are numerous concerns about its impacts on biodiversity: it may cause disease outbreaks in wild fish stocks, result in discharge of untreated waste and antibiotics and allow alien species to escape.'* There have been difficulties with finding locations to install projects and huge opposition, which led to a moratorium on new sites in 1995, which was lifted when a new policy required consultation with indigenous communities when considering a new site. New sites have to be at least one kilometre away from communities (Arengo et al. 2010). While over the years the sector has secured social

license from coastal communities, it continues to face opposition from a very small but vocal group of anti-aquaculture activists (RAIS 2014). There are other examples from around the world. In India, in Tunduruvu village of West Godavari district of Andhra Pradesh, studies by Rani, 2018, revealed that, though aquaculture activities brought about a positive impact on raising the standard of living of the villagers, half of them were against the negative impacts of aquaculture, particularly on the environment, despite being fully aware of the economic benefits accruing from aquaculture projects. Similarly, in Chile, there has also been opposition to the expansion of the salmon farming sector in new areas and a lack of social license within certain communities. For example, in Cobquecura, off the coast of Ñuble region, an aquaculture company presented 11 projects to the Chilean Environmental Assessment Service (Servicio de Evaluaciones de Impacto Ambiental - SEIA) to install hydrobiological farms off the coast in 2015. The projects included primarily farms for salmon and three other fish species including mussels and microalgae. From the moment these projects were presented, the inhabitants of Cobquecura and surroundings opposed the installation of the projects. After four years of collective community opposition, including municipal support, the company in question withdrew its concessions from the SEIA. This case was seen as a victory for the community, defeating the powerful salmon farming industry (INDH and DIHR 2021). In Tanzania, community acceptance has also proved essential for the development of cage fish farming/large-scale commercial farming of Tilapia and Catfish (Kapinga, pers. comm.). The ways of harnessing community support, and maintaining it over time, are however crucial, and public acceptance should also not be seen as a token. In the Philippines, for example, communities were promised employment and livelihoods, but did not receive materials and had limited involvement once the cage farms were established (Ferrer et al. 2017a., Ferrer et al. 2017b).

In relation to acceptance among the public of aquaculture production and among consumers of aquatic farmed products, and touching upon the ethics considerations discussed above, is the question of the extent to which consumers are willing to accept controversial ingredients in fish feed, such as those containing genetically-modified ingredients, while demanding high quality products. Black and Hughes (2017) argue that social acceptance of aquaculture in the UK will increase in the future because of more positive media coverage, demographic change and political support, but this remains to be verified there and in other places.

While Mather and Fanning (2019) argue that SLO is currently a fluid concept that could be adapted and reshaped “to suit the specific context of aquaculture, particularly if it can be the basis for a societally endorsed, sustainable aquaculture sector” (p. 280), much remains to be investigated about its links with other issues such as public image and ethics, as well as application and influence in the case of other aquaculture systems and cultural contexts.

2.2 People

2.2.1 Women (and gender inequality)

The issue of gender (in) equality in aquaculture is not new, with comparatively more literature and work on this aspect compared to the other topics addressed in this paper. The picture is clear: the aquaculture sector is gendered, with still wide inequalities between men and women in terms of participation and benefits regardless of whether they are involved in production or post-harvest (Brugere and Williams 2017). The availability of high-quality sex-disaggregated data is still limited, especially in relation to how benefits in the chain are distributed, and other aspects of the quality of women’s participation in the sector compared to men’s (Kruijssen et al. 2018). The evidence that does exist indicates that there are major gendered imbalances decision-making powers, in

access and control over resources needed to participate in the aquaculture value chain, and that there are formal and informal barriers, including gender norms, that limit women's equal engagement in the value chain. In Tanzania, where 80-90% of seaweed producers are women, subsequent stages where most of money is made (middlemen and exporters) are nearly exclusively men. It is also clear that issues and outcomes vary across contexts and are shaped by intersectional factors such as age, class, and religion (Morgan et al. 2017).

Data we have on women's participation is either too aggregated or too case-specific, but from what we know, there are large differences in the numbers of women involved depending on the type of production systems and their scale. For example, in Canada, 77 percent of employees in aquaculture are men. Most managerial positions in the salmon farming industry are occupied by men, only in administration female outnumber men (Arengo et al. 2010). More women are involved in small-scale aquaculture enterprises, but often as unpaid helping hands. Women dominate the post-harvest sector, and are the main workforce in fish processing factories, often in low-skilled positions. Far fewer are found at the head of large-scale, capital intensive operations. Women also perform fundamental supporting roles, as accountants, in marketing, in sourcing inputs, but will rarely become managers. In India, women seaweed farmers contribute substantially to the family labour in seaweed farms, and have positively contributed to increasing purchasing power in their families with respect to food, clothing and purchase of household assets, though in such cases the singular contribution of women is largely ignored. (Narayanakumar and Krishnan, 2013). Women's engagement drops as production intensifies and scale and responsibilities increase (Brugere and Williams 2017). Yet, there are examples where women have broken through ranks, become empowered and gained economic freedom, and where their aquaculture activities have led to improved family nutrition – but most of the time these are from carefully-designed, gender-sensitive interventions, or the result of a long fight to circumvent or overcome low self-esteem, fear, cultural or religious beliefs. Benefits for women from aquaculture do happen, but are not automatic (Brugere and Williams 2017).

New grounds have been broken in the last five years: gender studies in aquaculture (and fisheries) are now attempting to go beyond describing what men and women do and question the underpinnings of women's empowerment and gender equality through aquaculture development. Their findings are also much more widely communicated (e.g. genderaquafish.org, advocacy work of women's organisations in the sector such as the International Organisation of Women in the Seafood Industry (WSI)). Still, much remains to be done to go beyond numbers, to understand the real underpinnings of what makes women participate in, progress and benefit from their engagement in the sector, as well as propose solutions. Lack of sex-disaggregated aquaculture data is still a major bottleneck and available information from studies or datasets gives an unrefined picture of the situation. The aquaculture sector is still far from parity, let alone equality and empowerment.

Gender (in) equality is a human rights issue and linked to the issue of equity more generally. Gender dimensions are also very important in considering youth participation in aquaculture (discussed in the next section).

2.2.2 Youth engagement

The narrative that aquaculture will provide employment and income to growing numbers of unemployed youth is oversimplified. For a start, there is very little authoritative information about youth participation in aquaculture. A handful of studies have documented some aspects of this, but they remain ad-hoc. Arulingam et al. (2019) provides a comprehensive overview of the

challenges and opportunities for youth participation in aquaculture (and small-scale fisheries), which we summarize here.

Compared to capture fisheries, the people working in the aquaculture sector are relatively young. While data is scant, some studies specific to aquaculture indicate that people active in the sector are in majority young (<40, and more often <30), but the positions they occupy within production systems are unclear (Hishamunda et al. 2014). This was found for example in Egypt where 50% of workers were men below 30 years of age (Macfadyen et al. 2011), and in Vietnam where “graduates are able to find several job opportunities to work as farm advisors, sales people, quality control personnel, technicians or researchers” (Arulingam et al. 2019: 41). In contrast, in Cambodia, the sector is offering “little opportunity for employment and entrepreneurship for young people” (Arulingam et al. 2019: 41).

The attractiveness of employment in the aquaculture sector to youth depends on the image of the sector, and the alternative employment options available. In some contexts, aquaculture may be seen as a new and modern activity, while in others, e.g. in Nigeria where lucrative work opportunities in the oil sector are available, it is associated with low wages and poverty (Arulingam et al. 2019), or in Tanzania where it is perceived as a risky activity, in particular when compared to capture fisheries (Kapinga, pers. comm.). In other places across Africa, the image of the aquaculture sector is improving among the youth thanks to the support and visibility given to it by government, NGOs etc. as an engine of economic growth. Where the sector has reached a scale of development that creates skilled jobs, it tends to become more attractive to youth. Studies in India have found that “receptivity to new technology for aquaculture ventures was higher among younger farmers” (Leavy and Smith 2010: 44). Equally, youth’s tech-savviness is an asset that young graduates and entrepreneurs can bring to the industry, and the growing reliance of aquaculture operations on ICTs could be an additional factor of attractiveness for the youth, just as it is in attracting the youth (back) in agriculture (Lohento and Ajilore 2015). But we need to bear in mind that youth is not homogenous and that access to ICT and technologies is often gendered and unequal, in particular in developing countries (e.g. Singh et al. 2018).

In addition to age, education level matters. “For the rising numbers of youth with a formal education, the employment opportunities available often do not align with their own aspirations. For youth with lower levels of education, (...) these opportunities are usually poorly paid and under substandard working conditions” (Arulingam et al. 2019: 4). In these instances, youth are more victims than other groups of human rights and decent work breaches in aquaculture farms or processing factories, as well as being victims from systemic exclusion regarding, for example tenure and procedural justice. Young people are also more prone to the social stigma associated with the low-skilled jobs, and for women, sometimes even labour. In Bangladesh, social stigma (and its infringement on “dignity”, as in Fredman 2016) associated with labour and low-skilled tasks performed mainly by young women in processing factories can lead to diminished marriage and other social progression prospects (EJF 2003). To this needs to be added vulnerability related to discrimination in work pay and sexual harassment and violence.

The main challenges to youth participation in aquaculture can be summarized as (Arulingam et al. 2019):

- Access: to land (tenure, access rights, “navigating power structures to realise these rights), finances (e.g. obtaining bank loans, having enough collateral, accumulating savings, avoiding exploitation from informal credit providers, having enough financial literacy), decision-making (limited opportunities to participate in decision structures, gerontocracy barriers; the issue of collateral and access to bank loans was also reported in Mandania (2012)).

- Limited knowledge and experience, due (inevitably) to being young, but also to the fact that education systems and courses are not sufficiently attuned to the practicalities of carrying out aquaculture as a livelihood activity, or to the needs for 'modern' aquaculture entrepreneurs. Further education is also seen as a gateway to white collar employment opportunities, in the secondary or tertiary sectors.

- Greater vulnerability to exploitation and discriminatory working conditions, which may be more prevalent in the transformation of aquaculture products (post-harvest sector more generally) and disproportionately affects women and young women. For young women, all these challenges are exacerbated, e.g. de jure land inheritance excluding women, sexual harassment in fish factories, stigma and stereotyping of jobs, de-facto exclusion from decision-making bodies.

- Unconducive policy frameworks that corner young people into specific areas, and policy support for parts of the sector that do not provide most jobs for the youth (e.g. in Zambia where large scale farms are given priority instead of smaller ones where the majority of young men and women were found to be working). In addition, youth entrepreneurship policies often inadequately tackle deeply-ingrained structural issues (according to White 2012) and intersectional influences. The promotion of aquaculture among young people should be mindful of this trap and youth considerations must be explicit in policy-making.

Diverging policy objectives not only hinder youth participation but also contribute to the current knowledge gap on the motivations behind their engagement. In the case of agriculture, "Filmer and Fox (2014) suggested that the conceptual separation of the discourse and efforts to expand agricultural growth and enhance food security on one hand, from improving employment opportunities for youth on the other, could be a key contributor to this knowledge gap." Given its current development moto, there is danger that aquaculture could just follow the same track. It is also important that aquaculture development policies that aim to capitalise on youth potential are attuned to ground realities and to the wishes of young people to engage in the sector (which is not the case in agriculture for example). Another issue is that aquaculture and fisheries policies that do mention the youth (more numerous in Africa than other regions) tend to lump them with other social groups such as women or disadvantaged groups, and classify them in the vulnerable group category, which is not helpful for anyone.

At national level, countries like Tanzania, Nigeria, Egypt, have made timid attempts at involving youth in producers' associations or in developing aquaculture courses and qualifications in partnership with universities or vocational training institutes. In Morocco, a tendering process to allocate aquaculture concessions prioritized young entrepreneurs (ANDA 2017). Some recent aquaculture initiatives in West Africa have attempted to specifically target the youth and engage with them through educational and skill development programmes, platforms, policy influence but their impact on sustained youth participation in aquaculture still needs to be consolidated (e.g. van der Knapp 2020). In India, the ambitious programme of "Pradhan Mantri Matsya Sampada Yojana" (literally: aims at the integrated development of the fisheries sector, in the wake of the Covid-19 pandemic) is explicitly targeting the youth in fisheries extension services (Government of India 2020). These developments are encouraging but this type of initiatives explicitly targeting the youth are still scant globally; their success will depend largely not just on the number of jobs they create, but on the other barriers to youth's voice and fulfilment they alleviate.

2.2.3 Indigenous Peoples and Local ecological knowledge (LEK)

a. Inclusion and participation of Indigenous Peoples in aquaculture development

Inclusion and participation of Indigenous Peoples and other minority groups, as well as protection or at least consideration, of local ecological knowledge, are largely absent in aquaculture. This is surprising given that different forms of aquaculture were practiced by traditional peoples around the world prior to colonisation, and that aquaculture companies have a large presence in indigenous territories. However, inclusion and participation of Indigenous Peoples seem to have been neither the concern of the state (public authorities) nor of the private sector. For example, in Finmark, Norway, Norwegian salmon farming companies are pushing further into the indigenous Sami community fishing areas in the northern fjords (Pedersen 2012). In Chile, where all salmon farming activities take place in the Southern part of the country, including in indigenous territories of the Huilliche, Kawesqar and Yagan communities, neither the state nor the companies have complied with the obligation to consult indigenous communities before implementing salmon farming projects that could adversely affect access to traditional fishing grounds and spiritual areas as well as ways of living and ancestral traditions (INDH and DIHR 2021). In the Pacific Northwest, it is the combination Atlantic salmon farms' negative impact on native fish migratory routes and populations, encroachment on Indigenous Peoples' land and rights, insufficient reciprocal recognition of the legitimacy of Indigenous Peoples and national governments and their policies (Chamberlin 2012, Ladd 2011, Hersoug et al. 2017), and communication and trust breakdown between private producing corporations, government authorities and Indigenous Peoples (Chamberlin 2012, Christiansen 2012) which has led to the strong opposition of Indigenous Peoples to aquaculture in this part of the world. This undoubtedly echoes the breaches in human rights that were mentioned above (2009 case against a Norwegian company in Chile and Canada).

There are however signs that lack of consultation and conflicts with indigenous communities are being addressed through legal enforcement, and, on some occasion, proactive measures taken by the industry itself. In Canada, indigenous rights, including the historic treaties, are protected as a class of constitutional rights under domestic law, and therefore indigenous communities that have been adversely affected by the aquaculture industry can claim their rights. Thus, First Nations Hamalco and Musgamagw Tsawataineuk Tribal Council opposed the salmon farming industry on grounds that it damaged wild salmon stocks and asked Norway to respect the Universal Declaration for the Rights of Indigenous Peoples (UNDRIP), which it signed, to ensure that Norwegian companies honour the Declaration when operating in British Columbia. To address opposition, some salmon farming companies have also established direct agreements with the First Nations of the territories before entering an area, partly due to the fact that the authorities are not living up to their obligations of consulting with indigenous communities, but also out of respect and will for dialogue and cooperation (Christiansen 2012, Hersoug et al. 2017). Such agreements give indigenous communities oversight into the operations of salmon farming companies operating in their traditional territories (Seawestnews 2019).

In spite of opposition to large-scale aquaculture, there has been support for small-scale aquaculture development among indigenous communities. One small community, the Kitasoo in Canada, started a salmon farm due to unemployment when the commercial fisheries sector collapsed. The small-scale aquaculture projects have created employment and are carried out with respect for and consent from the communities themselves (Arengo et al. 2010). Similarly, in Washington State, USA, while some tribal nations vigorously resist cage culture, others are engaged in aquaculture enterprises as businesses generating income for the tribe. In New Zealand, Maori's aquaculture activities are supported by the Maori Commercial Aquaculture

Claims Settlement Act 2004 which gives iwi the exclusive right to apply for consent for aquaculture activities in designated “aquaculture settlement areas”. In Northern Australia, preferences of indigenous women for aquaculture have been investigated to engage them in aquaculture (Fleming et al. 2015). This suggests that forms of aquaculture that are culturally-sensitive, that recognise indigenous sea and water tenure and are aligned with local traditions and knowledge systems can develop and support Indigenous Peoples’ livelihoods and culture.

b. Use and protection of indigenous knowledge in aquaculture

Local ecological knowledge (LEK) underpins many traditional, indigenous aquaculture systems and is invaluable for the maintenance of biodiversity and intangible heritage associated with aquatic farming. Clam gardens in the Pacific North West (Deur et al. 2015, Groesbeck et al. 2014), freshwater and seawater fish ponds in Hawaii (Costa-Pierce 1987), integrated rice-fish farming in China (Lu and Li 2006, Halwart and Gupta 2004), integration of plant-cum-fish-cum animal components by fish farmers in the North East of India (Saha and Nath 2013) and other parts of Asia (Nandeesha et al. 2012), as well as other practices relying on knowledge of ecological functions and niches, are a way of life and contribute to local identities and ecological balance just as much as they do to food security or income generation. In Canada and Chile, large-scale aquaculture developments are a threat to this heritage. Equally, youth migration and disinterest in traditional farming systems may be associated with a decline in traditional, local ecological knowledge (Arulingam et al. 2019). Legal frameworks are still weak in recognising the value of LEK. For example, use of traditional/indigenous knowledge in relation to aquaculture and aquatic genetic resources is seldom included national laws and agreements about access and benefit sharing (Nagoya Protocol, Humphries et al. 2021). Threats to this cultural capital of aquaculture have grown even though indigenous knowledge was extensively discussed at the 2010 Phuket Conference, and its value not only for farmers but also the scientific community, in particular in supporting sustainable farming practices, was highlighted (Nandeesha et al. 2012). Sadly, recommendations made then to document indigenous technology and innovations prevalent in different countries, validate them through scientist-farmer partnerships, and mainstream them in aquaculture development projects, have received insufficient attention to revert the trend of appropriating/colonizing indigenous knowledge and creativity.

2.2.4 People with disabilities and other minorities

It is estimated that people with disabilities comprise 7-10% of the global population (World Bank 2005), making them the world’s largest minority (UN Enable n.d). Discrimination, poverty and high unemployment are inextricably linked to disability (UN Enable n.d). Disability aggravates risks of violence, which, like gender, age and status (e.g. migrant, refugee) is linked to higher rates of abuse and exploitation due to lack of papers, language skills or information, recognition and voice.

Disability itself is a social construct, in the same way that gender is. It is not merely a result of a handicap but can be imposed by society through attitudes, and laws and institutions that devalue and segregate people who deviate from physical norms (Liachowitz 1988). Disability is also a relative term, as impairment can be more or less disabling depending on the society and environment in which it occurs (Guernsey et al. 2012). A rights-based perspective on disability supports the view of disability as part of a social model, by opposition to a medical model. The medical model places an impairment in function on the person and as the reason for receiving care, while the social model shifts focus on society’s capacity to lift barriers to the inclusion of persons with disabilities (ibid). This shift in paradigm is important because it means that under the social model, “people with disabilities become active claimants of their human rights” and can

“become empowered as full participants in society and members of their communities” (Guernsey et al. 2012: 4).

In aquaculture, while some farming tasks may be riskier to perform for a person with disability (e.g. diving for the maintenance of pens), there is enough variety and amenability in skills and tasks in the sector that the willingness for inclusiveness should lower the barriers to the participation of people with a disability. Yet inclusion of disability is not part of the aquaculture development agenda, and this paper is probably the first to ever broach the issue: there is no data about the number of disabled people employed in aquaculture, and no study reporting their presence in the sector could be found – a gap that needs to be urgently filled if the sector is to leave no-one behind in its contribution to the SDGs.

3. Future developments: moving away from business-as-usual

The above argumentation suggests that not only have social and human dimensions (the third pillar of sustainability) been given far less consideration than the other two pillars of sustainability – economy and environment. If this is so, we are then in a case of “weak sustainability”, i.e. when it is allowed to deplete one form of capital (here: human) as long as others (e.g. financial, and to some extent natural) grow in equivalent quantity. One may also wonder why the incremental positive changes/improvements that the sector has witnessed over the last 2-3 decades towards more “sustainable” production systems and value chains, even in their cumulative effect, are still so vulnerable to unexpected shocks. Such vulnerability would suggest that the business-as-usual development trajectory that the sector has followed so far is not safe. Indeed, aquaculture is about people just as much as it is about “fish”². Given this, can we say that the sector is progressing towards sustainability/being sustainable if it still inadequately accounts, addresses, and contributes to the wellbeing of people? There is a long way to go for the sector if no-one is going to be “left behind”. Meaningful consideration of these topics/issues should make us rethink about what we really mean by “sustainable” aquaculture. As the term has lost so much of its original meaning, there is a pressing need to add “equitable” to it – and really mean it.

Time has come for an in-depth transformation of the sector. Addressing the social and human issues in aquaculture that we discussed above is pushing the boundaries of what the sector has been traditionally asked to do, i.e. produce fish and nourish populations, preferably in the most environmentally-friendly way. This will mean departing from business-as-usual, and is likely to be outside the comfort zone of those spearheading the sector’s development. It will take some strong stands from public authorities and private entities, as well as the support from the civil society. In this regard, all actors have a role to play: the private sector, at all scales, which is driving the development of aquaculture, needs to change its standard practices, public bodies need to find the right incentives to make this work, and non-state actors need to be an integral part of a new dawn for aquaculture development.

So what will this entail? First greater transparency and opening of the black box of human and social issues in aquaculture, and second, a new human relationship with aquaculture that takes the development of the sector on a new trajectory.

² aquatic species.

3.1 Opening the black box of human and social issues in aquaculture

Private sector dominance and economic interests in aquaculture production and post-harvest, as well as insufficient transparency and loopholes have pushed and hidden away social and human issues, including ethics, into a ‘black box’. Part of the reason is that private sector motivations are typically economic, and efficiency concerns may not be necessarily aligned with wellbeing concerns. There has also been both reluctance of government authorities to push for stringer standards on one hand, and skirting of issues of equity, human welfare and rights in (voluntary) aquaculture certification schemes on the other. Weak governance and law enforcement have compounded these issues. The black-box effect makes it difficult to track corporates’ human rights records, decent employment and discrimination everywhere and at each stage of the aquaculture value chain.

The opacity of the black box of social and human issues is also compounded by the difficult accessibility of private and court case information, the fact that discrimination on grounds of gender, age, race, religion, or ability is insidious and often goes unreported or unquestioned, and the fact that our current lack of knowledge on the interplay of human and social issues on aquaculture development outcomes – and vice-versa, is still incomplete. Many questions remain. For example, regarding human rights: could the situation in Chile salmon farming be found elsewhere, in other aquaculture production systems? Are violations of human rights and equity principles more prevalent in capital intensive systems than small-scale ones? To these questions there are, at present, no answers, giving way to the possible argument that cases of violations that have been exposed in the mariculture sector are in fact random and isolated, and of little consequence to the rest of the industry since, globally, most of the seafood produced comes from freshwater, less intensive farming systems.

Emphasis on growing the resilience of the sector, which is increasingly – and and rightly so – an objective of development for aquaculture, needs to be more nuanced. Resilience is not always a good thing: as some of the examples above suggest, some aquaculture systems based on discriminatory practices may be very resilient to change by finding ways to adapt without putting their practices into question.

Is aquaculture creating more negative human and social impacts than it is contributing to human wellbeing (nutrition considerations aside)? Despite its best intentions, and even with acknowledging that issues have changed and that some progress has been made, our review would suggest a rather net negative... It has taken decades for the sector's reputation and image to recover from its exposure of poor environmental records (cf. shrimp farming industry and mangrove destruction in Asia and Central America in the 1990s) and the threat of misinformation is still omnipresent for producers (e.g. Tasmania's Atlantic salmon farmers, ABC Rural 2021). Could such reputational damage happen again, or be aggravated further, if the sector's human rights track records are exposed to the wider public? With added public scrutiny and powerful media, not performing well on the human front could be a tightrope to walk, and it would not take much to jeopardise all the advances that aquaculture have been made over the last two decades in terms for food production efficiency.

Educated consumerism and ethical seafood purchase choices on one hand, and media pressure on the other, are powerful in shaping demand for more sustainably and equitably farmed seafood, but could also play a key role in demanding greater clarity about the contents of all companies’ black boxes. This is however not sufficient. Asking that the aquaculture sector “should not degrade aquatic resources or the environment; should not foment conflict and instead take into consideration limitations of and competition for land, water and other productive resources; should

not create nor widen inequalities; should not exclude, exploit and displace vulnerable segments of society, and should not lead to the debasement of local culture and traditions” (FAO 2020 Shanghai Declaration draft) implies a fundamental shift in role and function of the sector, from one guided not by sole profit and utility maximization, which are the drivers for private entrepreneurship, but also representing the interests of society at large. Government/public intervention, as well as participation of non-state actors, are therefore needed (in the form of legislation, incentives, change in narrative emphasizing and ensuring human and social benefits, involvement and consultation of multiple stakeholders concerned) to ensure that this shift occurs.

3.2 A new human relationship with aquaculture

In line with the recognition that “food systems are complex, and are closely connected to, and significantly impact, human and animal health, land, water, climate, biodiversity, the economy and other systems, and their transformation requires a systemic approach.” To progress on this track of transformation, we propose a new human relationship with aquaculture...
... founded on substantive equality and agency that are recognised, intersectionality that is embraced, and cross-disciplinary knowledge systems that are valued,
... implemented through new, inclusive, business models, social provisioning approaches and benefit sharing mechanisms,
... where public, private and non-state actors are involved, and within these, in line with the UN Food Systems Summit 2021, emphasis on small-scale farmers, women, youth, people with disabilities and indigenous communities as key groups,
... and enabling the realisation of an aspiration for: “multidimensional”, “collaborative”, “efficient”, “safe”, “fair”, “adaptive”, “transparent” (from Stephen and Wade 2019), as well as participatory and rights-respecting aquaculture development.

Foundations and approaches for developing this new human relationship with aquaculture, which, together, if appropriated (through a change in mindset) and implemented (through a change in practices and priorities) constitute a step away from business as usual, are expanded upon below.

3.2.1 Foundations

a. Substantive equality and agency

Aquaculture is fast changing our utilization and relationship with our aquatic ecosystems, including riparian, lacustrine and coastal, in the same way that agriculture has changed our relationship with our landscapes and the natural environment, and that our relationship with the oceans is changing (Allison et al. 2020). This new relationship cannot be shaped and driven by sole economic interests. Our new human relationship with aquaculture could be one where human rights take centre stage and where the “distributional, recognition, structural, and exclusive wrongs experienced by out-groups” (Fredman 2016: 738) are addressed.

We contend that this vision of a new human relationship with aquaculture could be underpinned by the four dimensions of “**substantive equality**” (Fredman 2016), shown in Figure 2. This compelling framework, which is action-oriented, emphasizes the human rights thread that links its four pillars, and demystifies issues so that the approach to redress inequality, injustice, discrimination and all social and human ills in the sector is practical and resonates with aquaculture producers, concerned resident communities, regulators, decision and policy makers. By being multi-dimensional, the approach to substantive equality allows us to consider together and address the interactions between the different facets of inequality experienced by women

and minority groups, by assessing and assisting us in modifying policies and practices that create disadvantage, perpetuate stigma and stereotypes, impede participation, mute voices and are blind to differences (Fredman 2016). We however concede that the four pillars of substantive equality are not necessarily straightforward to implement and can carry their own issues. Balanced and nuanced applications that consider the implications of acting on each of these dimensions are needed to avoid falling in the one-size fits all pitfall, and the consequences of prioritizing one or some dimensions over others.

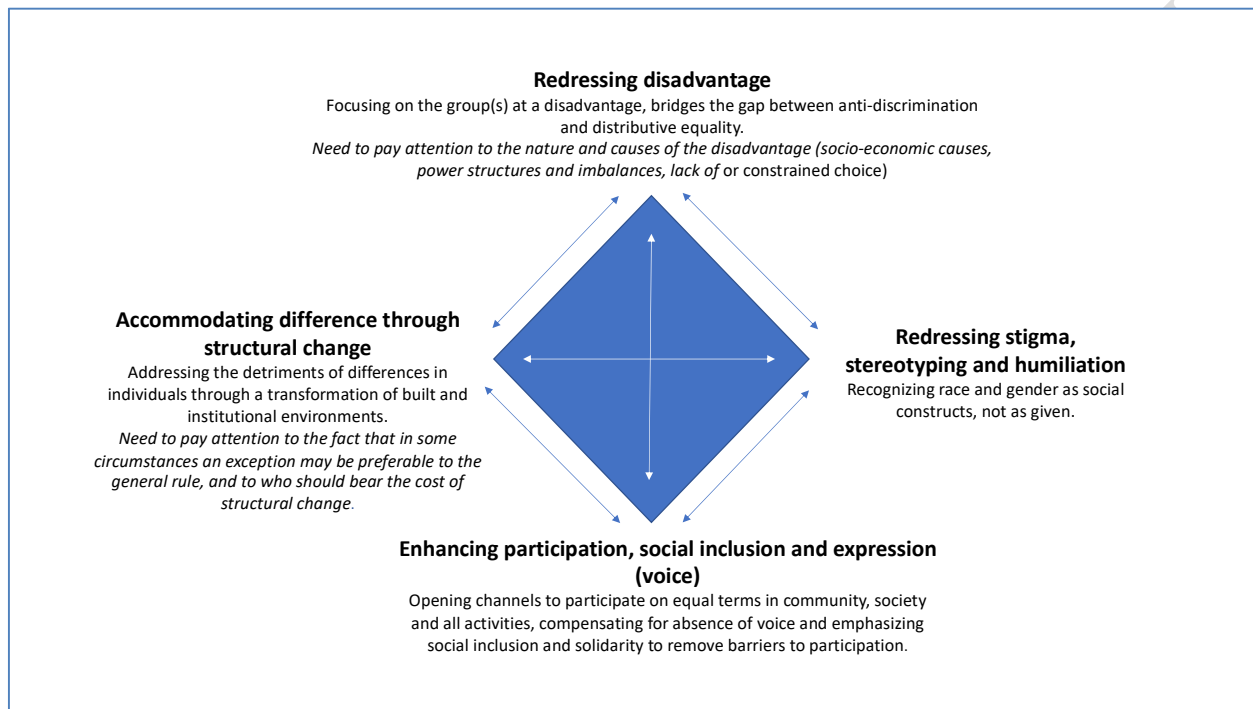


Figure 2: Substantive equality in a diagram.

"The four dimensions of substantive equality create a complex and dynamic conception of the right to equality" (Fredman 2016: 738). *Italics* represents some of the challenges raised by some of the dimensions.

Substantive equality could become a fundamental principle for sustainable and equitable aquaculture development, notably to progress towards greater respect and promotion of human rights, justice and equity in aquaculture. Equally, achieving it could become a practical objective. Levers that can be pressed to progress towards this objective do exist, but are still lagging behind and require improvements: e.g. certification and tracing, legislation, awareness and education, and capacity building on social and human dimensions, as well as new business models – detailed further.

We also recognise that advances in other fields should be complementarily used to address specific issues and bring social sciences in aquaculture development to the fore. For example, in the pursuit of gender equality, the notion of **agency** provides a complementary lens through which it is possible to understand how women involved directly and indirectly in aquaculture are able to anchor their identity and role in the development of the sector and draw greater personal and economic benefits from it. It is however rarely used and would deserve greater attention in both research and development (Gustavsson 2020) for its relevance in the context of aquaculture.

b. Intersectionality

Factors making up each individual's identity, such as race, class, caste and gender, intertwine in unique ways that create advantages or disadvantages, social discrimination or opportunities. This is called "**intersectionality**". None of these factors should not be taken in isolation from one another when understanding, documenting and addressing individual experiences. Greater consideration and accounting of intersectionality could thus be considered as an additional way to bring all the issues discussed above together and overcome marginality created by disability, gender, age and ethnicity.

c. Integrated knowledge systems

In order to **integrate knowledge systems and building bridges across the disciplines aquaculture development relies upon**, the multiple evidence base (MEB) approach, which proposes that "parallels whereby indigenous, local and scientific knowledge systems are viewed to generate different manifestations of knowledge, which can generate new insights and innovations through complementarities" (Tengö et al. 2014), could help bringing people back at the centre of aquaculture development. Tengö et al. (2014) argue that "if representatives from diverse knowledge systems, including scientists and decision makers, accept each other's legitimacy and power, space is created for developing collaboration from the onset of a project, grounded on the appreciation of different ways of understanding the world" and that "empowered and respectful partnerships are a constructive starting point to investigate and identify solutions for environmental change and sustainable development". (ibid, pp. 585-6).

3.2.2 Implementation

Implementation relies on both and simultaneous strategies *by the sector*, i.e. directly applicable to aquaculture, and on strategies to *enable the sector*. In the former category fall inclusive business models as well as innovative procedures and governance mechanisms supporting changes in practices and greater respect and fulfilment of human rights. The latter category encompasses social provisioning, as well as capacity building to increase focus on social and human issues, and deliver on these.

a. Inclusive business models

While there is no generally accepted definition of **inclusive business**, it often refers to inclusion of marginalized groups (e.g. smallholder farmers or low-income members of a community, or women) into business. This can be about ensuring that these groups are able to access certain inputs, services or markets, or about ensuring that marginalized people are able to be a provider of such an input or service (as entrepreneur). In aquaculture, this discussion is often about smallholders and the degree to which they are able to participate in value chains (Kaminski et al. 2020). However, inclusive business can also be about the degree to which aquaculture as a sector generates inclusive economic growth in a country, and what kinds of systems are more equipped to do so. For example, studies in Bangladesh (Belton et al. 2012) and Ghana (Kassam and Dorward 2017) suggest that production by small- to medium-sized farmers had more indirect effects on poverty reduction than large commercial systems. This is also being observed in the context of shrimp farming in the Philippines (A. Ferrer, pers. comm.).

The question of inclusion of marginalized groups in aquaculture has mostly been studied in relation to high value (export) chains and the degree to which smallholders are in- or excluded. A number of business models have been suggested to have potential for inclusion for smallholder

farmers by addressing common constraints such as access to finance, inputs, technical and market information, and services, high transaction costs and low bargaining power (see Kaminski et al. 2020). However, whether or not these models work depends on the specific socio-economic and cultural context, existing market realities and enabling environment. No single model is perfectly fair or inclusive, and the detailed arrangements define the extent to which local smallholders can benefit (Kruijssen et al. 2020). In a few countries, some studies have investigated the degree to which aquaculture contributes to national economic growth and whether this growth is inclusive (e.g. Cambodia and Zambia, VCA4D 2017). They have focused on profits earned by different types of actors along the value chain, disaggregated according to different systems and scales, on the degree to which this generates employment, and on how much of the value added is generated within the country. However, this type of analysis is lacking for many countries and would need to take place. There is also much unknown about models that ensure inclusion in other parts of aquaculture value chains. Downstream in the chain, inclusive business is more generally about the degree to which social and labour rights are being respected, both for workers and for the communities surrounding processing facilities.

This notwithstanding, the literature on inclusive business models (from agriculture), defines several potentially inclusive business models, and draws three main conclusions (Vermeulen and Cotula 2010). Firstly, there is no one-size fits all in inclusive business, which means that what works best for smallholders while still being attractive to investors is dependent on tenure, policy, culture, history, and biophysical and demographic factors. Secondly, of the models defined by Vermeulen and Cotula (2010), none is perfectly fair nor a holistic solution to rural development. Thirdly, the detailed arrangements of the agreements are more important than the abstract model in defining the extent to which a business model is *really* inclusive. Therefore, when considering potential inclusive business models, three main questions need to be taken into account (Kuijpers et al. 2021):

- What is its potential for redistribution of power? Approaches that seem to have a high potential to achieve this include collective action (including self-help groups in aquaculture, as described in Vipinkumar et al. 2017), farmer-owned enterprises and women's economic empowerment approaches.
- What is its potential for improved value chain functioning for marginalized actors? Here approaches with high potential include collective action models, value chain contracting (with resource provision), and integrated value chain development. Also, tools such as IT could reduce value chain risks and transaction and coordination costs.
- What is its potential for enhanced well-being? Here in particular social enterprises could be of interest, which are purpose-driven rather than profit-driven. Blockchain and other digital applications can be used as tools to improve value chain transparency and enable the achievement of social and environmental outcomes.

As such, inclusive business models hold potential to redress issues of violation of human rights, decent work and breaches in ethics raised above, possibly with some modifications to ensure their focus shifts from economic upgrading to social upgrading (Kaminski et al. 2020). In doing so, they may also help open the black box of social and human issues in aquaculture.

b. Benefit sharing / procedural justice and other forms of governance

Benefit sharing can be seen as a practical extension to the concept of equity. Benefit sharing is at the core of the question of "aquaculture - for whom?" (Krause et al. 2017). This notion was initially articulated in the Convention on Biological Diversity and Nagoya Protocol on Access to

Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from Their Utilization and is important for the conservation of aquatic biodiversity (Benzie et al. 2012). But benefit sharing can also be understood more generally as the institutional processes and power dynamics that condition access and capabilities to reap benefits (Ribot and Peluso 2003) and, by extension in the context of aquaculture, as the fair and inter-generational distribution of the sector's benefits (Brugere et al. 2021). Although it can be interpreted as a concept, it essentially boils down to a distributive arrangement. Ten years on from the Phuket Conference on aquaculture where benefit sharing was also mentioned (ibid), its implications for aquaculture and main producing countries have hardly been studied (Humphries et al. 2019, Humphries et al. 2021), let alone mainstreamed as an equity principle in aquaculture policy or as a mechanism for achieving more equitable aquaculture development outcomes (Brugere et al. 2021). One reason put forward for this failure is that "prevailing state, market and financial institutions (...) undermine the capabilities of producers, traders, and consumers and (...) appear unable to transform the conditions for equitable, nutritious and/or sustainable food practices to emerge." (S. Bush at MARE 2021 Conference). Indeed, prevailing governance and power patterns underpin benefit sharing arrangements and outcomes (Wynberg and Hauck 2014), which themselves rest on a range of interventions designed to achieve redistribution objectives, such as community-based natural resource management, cooperative management, revenue sharing, fair trade, certification and corporate social responsibility (CSR) (ibid). While these interventions per se can be more or less suited to aquaculture and the management of the resources it relies upon, and are themselves prone to power influences and governance pitfalls (for example, Wynberg and Hauck (2014) consider CSR as one of the weaker form of benefit sharing intervention due to prevalence of private interests), they nonetheless offer useful entry points into the process of both understanding distributional inequalities and redressing them. In this regard, Wynberg and Hauck (2014) have developed a useful set of questions enabling to dig into contextual specificities (who are the actors, the institutions, the resources, how do they interact and with what consequences) which could help tailor benefit sharing interventions to the context of aquaculture.

Associated with this, the review of tenure rights and how they shape access, opportunities and all forms of benefits, including the fulfilment of the fundamental rights of those engaged in aquaculture, would support the change from business as usual, and departure from the perpetuation of exclusion and/or abuse. Investments in forms of collective agency could also be explored to support the voice and recognition of those who have been marginalised by aquaculture development.

c. Social provisioning approach

The social provisioning approach has emerged from feminist economics. This branch of economics could provide inspiration for new economic research approaches in fisheries and aquaculture that meaningfully encompass gender but also other human dimensions such as those discussed so far (Williams 2021). The term "social provisioning" "emphasizes the analysis of economic activities as interdependent social processes" and thus allows for a broader understanding of economic activity (Power 2004: 6). The term also emphasizes process as well as outcomes and the influence of social norms in both. The five principles of social provisioning not only touch upon key human concerns in aquaculture and fisheries, but also naturally lend themselves to concrete actions and changes in practices, making social provisioning an approach highly relevant to the sector (Figure 3).

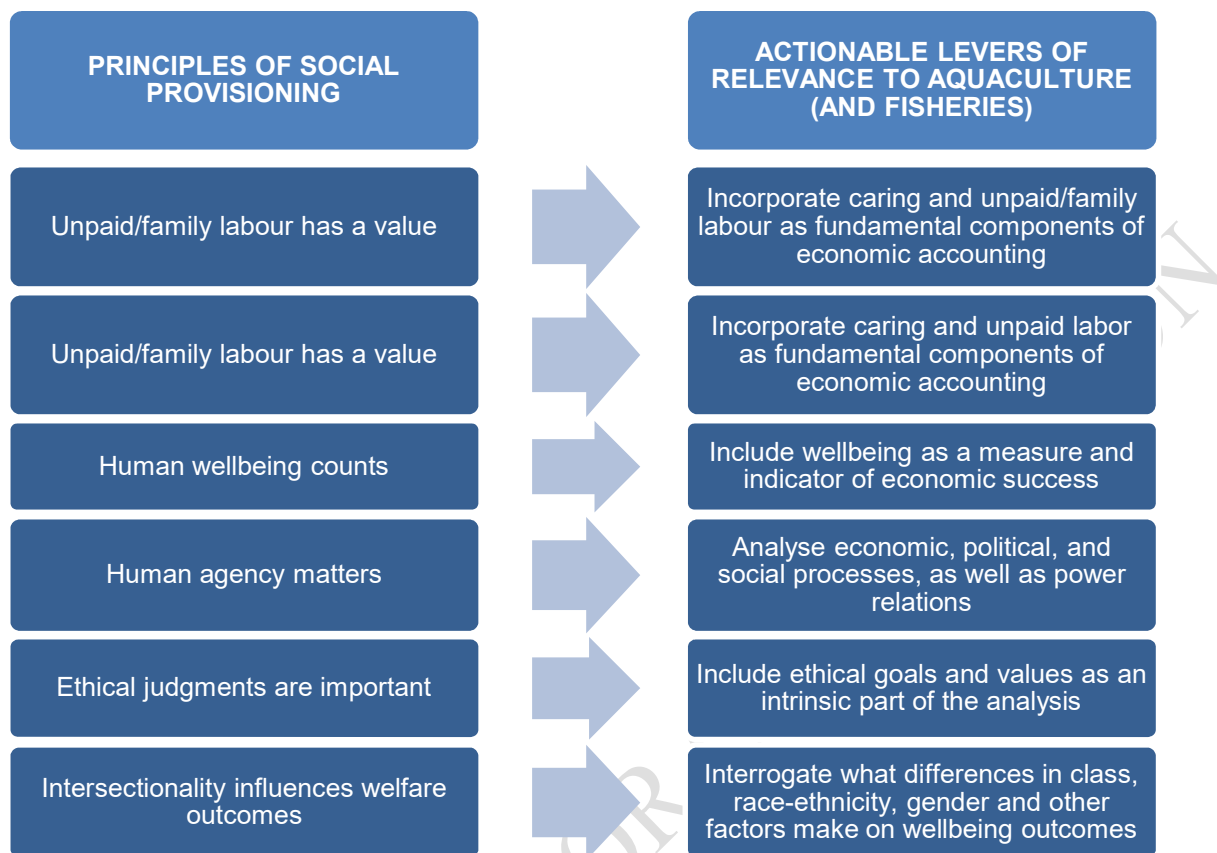


Figure 3: Social provisioning principles and related actions to increase wellbeing from aquaculture.

Sources: Power 2004, Williams 2021.

In conjunction with a set of essential characteristics for aquaculture development which could be elaborated from Stephen and Wade (2019)'s "multidimensional", "collaborative", "efficient", "safe", "fair", "adaptive" and "transparent" characteristics, and agreed upon as objectives for humanising future aquaculture development, social provisioning offers a starting for an economic analysis of the sector that has social and human concerns at its core (Power 2004). This could set the trajectory of aquaculture on a new development track all together, and meaningfully advance its contribution to human wellbeing.

d. Capacity building

Human capacity building has long been a recommended in support of aquaculture development, and greater capacity has undoubtedly supported the fast development pace of the sector. But social and gender capacities in the sector are still insufficient in absolute terms and comparatively to other disciplines. This capacity is needed for the social sciences in the sector not only to 'catch up' with others, but play the guiding role required to ensure that aquaculture development leads to positive human and societal outcomes. Those sciences are also needed to support cross-sectoral planning, for example by helping identify trade-offs that may occur between and across sectors and subsectors (e.g. whether aquaculture investment would undercut those in small-scale fisheries, or whether, at higher level, progress towards some SDGs thanks to aquaculture

development would be at the expense of others). This is all the more critical that many countries are embarking in developing their blue economies: the place and role of aquaculture in a just Blue Economy are yet to become more visible.

Key messages

Message 1 – Neglected social and human dimensions

Fundamental social and human dimensions are not making it in aquaculture development.

Human and social dimensions need to be accounted for, in all ancillary/upstream and downstream supporting sectors, not just production.

Not enough is done to progress social and human dimensions because of private sector dominance and misalignment of private sector interests with the betterment of human welfare.

Addressing environmental impacts must continue but human wellbeing needs to be equally prioritised, particularly given the connection between environmental impacts of aquaculture on ecosystems that humans inhabit and consumption of food from contaminated environments.

Not enough knowledge and details are available on the different players and their interactions (e.g. small-scale, larger scale enterprises) and how these are affected by, and influencing aquaculture development, in large part due to the black box effect of the private sector which prevents in-depth analysis and exposure of social and human issues that some practices may raise. We do not know enough either about the involvement of all youth - boys and girls - in aquaculture, despite the potential they represent for the future of the sector, nor about what underpins women's empowerment from their engagement in aquaculture. Indigenous peoples seem to fall in a vacuum between public and private concerns and the value of local ecological knowledge in maintaining traditional aquaculture production systems and associated cultural values is not recognised.

Most importantly, the human rights impacts of the aquaculture sector and the implications thereof have been largely absent and scarcely respected in research, work by international organizations, governments and company policies and practices.

Message 2 – Transformation

A transformation of the aquaculture sector is required, i.e. a move away from business as usual towards a new human relationship with aquaculture aligned with human wellbeing concerns and greater contribution to the human development goals.

Having established itself as a major food producing and economic sector, the aquaculture sector now needs to proactively integrate human rights, social justice and human wellbeing perspectives at all scales. This sector needs to be supported by greater aquaculture policy coherence between production, environment, trade and social welfare.

The narrative about aquaculture development needs to shift a notch further towards wellbeing. The sector has evolved from producing more to producing better (with fewer environmental impacts). FAO's discourse is about aquaculture's contribution to food security and poverty alleviation, which are only two elements of human wellbeing. But aquaculture will only reach these two developmental objectives if it addresses and acts on the fundamental underpinnings of these two elements: equity, human rights. The next decade needs to be about producing for human wellbeing. This requires a paradigm shift from quantity to quality so that the sector plays a role in the fulfilment of human rights, equity (gender/women, youth, indigenous groups) and ethics. New or renewed mechanisms need to be established to support this, and indicators of development and progress need to be designed to capture this.

To this end, governments need to generate more understanding about the degree to which the aquaculture sector really contributes to economic growth that is inclusive and promote policies that address these issues. Different governance mechanisms can then be developed to support more inclusive growth and a fairer distribution of value and power in the chain.

Similarly, more understanding is required of alternative business models that can promote such inclusiveness through the private sector and the conditions under which this contributes to transformation.

New modes of operating, e.g. inclusive business, need to be found, that better connect small-scale and larger scale players throughout the value chains and redress imbalances of power.

The private sector (or aquaculture producers / processors' representatives) need to become a real partner, work more closely with governments and international organisations as the modus operandi of private companies has direct impacts on people and their wellbeing. Representatives of small and medium scale operators need to be equally represented in working with government in order to rebalance powers and influence typically exerted by larger private players on governments.

Aquaculture is a sector of great complexity, acting on one human dimension will have impacts on others (positive and negative) because of all the interconnections that exist across social and human dimensions and across multiple players. The challenge will be to ensure an overall desirable outcome.

The aquaculture sector is one of great complexity and the intertwining of human development issues in aquaculture production and value chains and across players (small, large, public, private) is a great challenge for its governance and influential in its outcomes. It is at the same time an opportunity because acting upon key levers (e.g. human rights, certification) can have positive and simultaneous impacts on the sector at large and the wider society.

Considering youth or women or Indigenous Peoples, people with disabilities or other socially and economically backward groups of society means considering gender equality, human rights, access (e.g. tenure rights), educational opportunities, and vice-versa.

Message 3 – Human rights and equity

The consideration of human rights (including labour rights), justice and equity in aquaculture should become a priority for the development of the sector in the next decade.

Human rights should be given greater consideration in aquaculture, and concern not just company employees, but communities at large.

Human and social dimensions, and the human rights that underpin them, need to be accounted for in all ancillary/upstream and downstream supporting sectors, not just production. Equity concerns need to take the driving seat in the future of aquaculture development at all scales of operation and all stages of value chains.

Governments have a duty to promote and protect human and labour rights of those affected by, and who work for, private sector operations, which includes aquaculture enterprises and initiatives. Governments with large aquaculture activities in their countries should ensure that their legal and policy framework adequately incorporates the aquaculture sector (e.g. in labour laws, through specific sector laws, environmental and social impact assessment (EIA/SIA) legislation, in National Actions Plans on Business and Human Rights, in SDG-related policies etc.).

The rights of women, Indigenous Peoples and people with disabilities should be put higher on the agenda of the aquaculture sector, both in policy and practice.

Civil society and non-governmental organisations (social, not only environmental), need to be on board to promote and enforce human rights, including labour rights, at all scales throughout the value chain.

Aquaculture companies as well as other stakeholders such as UN agencies, NGOs and researchers should conduct more in-depth studies and assessments to better understand the labour and wider human rights impacts of aquaculture in order to address these.

Message 4 – Certification

Certification, eco-labelling and tracing systems should be reviewed and expanded upon to better cover social and human issues, both in terms of content and process, and at more nodes in the chain because they could potentially be a key tool in helping address them if it is ensured that they are not excluding and that their impact is detrimental to smaller farmers.

The aquaculture sector relies largely on certification standards to assess social and environmental issues. While certification contributes to understanding some of the impacts of aquaculture activities and supports traceability, certification schemes have limitations in terms of understanding root causes of the social and human rights impacts. By their nature, certification audits, which are snapshots in time, miss some of the pertinent human rights impacts of the sector and reinforce the façade they give to the outside world. They should therefore be reviewed and updated to adequately encompass all the social and human dimensions described above.

Certification should also aim to help close the gap between small-scale and large players, especially as value chains are increasingly globalised. For this to work however, the supremacy and influence of large players who tend to use certification to increase their market shares, needs to be reduced to give a chance to small-scale farmers access these schemes on one hand, and allow more progress to be made on the integration of social and human issues in certification schemes, on the other. Greater collective action in the workplace, representation and defense of workers' rights needs to take place in parallel.

The development of a model code of conduct regarding human rights should be actively encouraged. Regardless of whether it is driven by FAO or governments or industry groups, such a code (or best practices or standards) needs to heed and value social and human dimensions, as these issues affect all types of businesses along the entire value chain (cf. recommendations that were formulated at the intention of the government of Chile to improve the human rights record of the salmon industry – promotion of the Chilean National Action Plan on Business and Human Rights).

In order to overcome implementation and enforcement issues when code(s) are not binding, a multi-partite system of reciprocal scrutiny and accountability, involving producers - small and large, government, civil society organisations (CSO)/NGO and consumer groups, could be envisaged.

Message 5 – Diversity of players

The aquaculture sector involves a wide diversity of players that needs to be adequately recognised and represented in policies, guidance and analyses.

Youth, women, migrant workers, indigenous people and disabled people should not be considered together as a 'vulnerable group'. These people form groups that are not homogenous and we need to look beyond these categories.

Players also range from a wide spectrum of small-scale to very large-scale enterprises, with different capabilities and influence.

Intersectionality is therefore of key importance to consider; gender, race, ethnicity, age interact and intersect with other social markers such as wealth, age, religion and/or other social characteristics. This in turn affects the different needs, risks and enabling/limiting factors for different groups of women and men, young and old, or indigenous or people with disabilities.

5.1 Women and gender

Any aquaculture development has gender impacts. Greater scrutiny is needed because gender equality is not just in numbers. Aquaculture is multi-faceted and gender issues are not the same everywhere and for everyone, so we need to pay attention to these details in our daily work.

An urgent transformation and rethink of the way aquaculture is done is required if the sector is to contribute meaningfully to SDG5 and other gender-related SDGs. Gender-

transformative approaches, at all levels, can support this, along with the development of aquaculture policies, toolkits, guidance and certification schemes that are gender sensitive and pay more than lip service to gender equality, the building of gender equality targets in every aquaculture development strategy and in labour laws that, for example, recognize the status of assisting spouses or give land rights to women, the funding of more research to understand better what supports or hampers women's empowerment and contribution and progress in the sector and the acceleration of efforts to collect and use sex-disaggregated aquaculture data.

5.2 Youth

Youth participation in aquaculture is very stereotyped. Insufficient attention is paid to the structural factors (e.g. size of companies, type of production (local or export markets), liberalization of economies and restructuring of the sector, access to assets etc.) affecting youth's development and engagement with the sector at the stage of production, but also importantly in other segments such as transformation, retailing, marketing, exporting.

Youth participation is tightly linked to the image and attractiveness of the sector. The more modern image and attractivity of the aquaculture sector compared to fisheries is an advantage, but youth' affinity and willingness to engage in aquaculture appears ultimately highly dependent on the state and dynamism of the industry, as well as individual educational attainment and remuneration levels that compete with what can be offered in other economic sectors. The image/stereotyping of some positions also play out in the attractiveness of aquaculture jobs for young women.

5.3 Indigenous Peoples

Indigenous Peoples have been insufficiently included in consultation processes related to aquaculture development taking place within their territories, and as consequence they have suffered from violations of their rights, including impacts on their livelihoods, culture and traditions. Their participation in aquaculture development can lead to win-win situations for aquaculture developers and local indigenous communities if their rights are respected, if adequate consultation, obtaining their Prior Informed Consent (PIC) and engagement takes place from the outset before new operations are started and throughout the lifecycle of projects.

The attractiveness and potential development of smaller-scale aquaculture operations maintaining the culture and heritage of Indigenous Peoples, and the value of local indigenous knowledge in exploiting ecological niches and sustaining ecologically sound farming systems should be further investigated, recognised and enhanced, and be used as an opportunity and asset to realise self-determination.

Message 6 – Research

More research, including trans-disciplinary research, needs to be funded to fill knowledge gaps, to document human dimensions in aquaculture and propose changes to the status quo (solutions).

More research is needed on gender issues and dynamics, transformative actions that have the potential to redress gender imbalances and powers, and empower women in the sector.

More research is needed on youth's aspirations and participation in aquaculture and on the structural factors that can promote/hinder them. Equally important is to understand the causes and prevalence of child labour in the sector, and the levers that can be acted upon to move from hazardous working conditions to decent employment.

More research is also needed on the positive and negative impacts of specific forms of aquaculture development on Indigenous Peoples and the survival, sharing and enhancement of the value of local ecological knowledge.

More research is needed to document the presence, opportunities and constraints to disabled people's participation in, and benefits from, aquaculture.

More research is needed on new/alternative business models such as social enterprises, farmer-owned enterprises, women-centered value chains, and IT innovations for value chains should be further investigated for their potential to achieve transformation in the sector.

This research needs to be underpinned by better and more refined data collection and analysis disaggregated by sex and age.

A greater number of social scientists is needed in aquaculture research.

Finally, human rights in aquaculture are an entirely new field for both conceptual and empirical research. Analysis of human rights records in aquaculture systems (salmon, shrimp and others) could use Fredman (2006)'s framework or the pioneering work carried out in Chile as a starting point to develop guidance on how to assess and address human rights in aquaculture for all the stakeholders of the sector. With the increasing focus on governments' duty and businesses' responsibility to promote and respect human rights, the human rights impacts and records of aquaculture development needs to be urgently and transparently documented, evaluated and addressed at all stages of the aquaculture value chain.

Concluding comments

In this overview, we have treaded on many stones that had never been unturned in the context of aquaculture development. By doing so, we have exposed how much leaving them un- or insufficiently addressed is jeopardizing the positive human and social outcomes that can be derived from aquaculture development. We see this work as laying the ground for our new human relationship with aquaculture. Our reflection on the way forward is still young and will merit further work, in particular in relation to the following points which we could not elaborate further on here.

Learning more and drawing lessons from agriculture:

Just like examples of good practices and advances are drawn from capture fisheries, agriculture too can provide insights into how it has addressed human rights, decent work, justice and equity, and what it has done (or not) to become more inclusive to women, the youth, Indigenous Peoples

and people with disabilities, given the similarities between the farming of fish and the farming of other animals on land. As a concrete example, it would be interesting finding out if or how national agriculture labour legislation deals with aquaculture labour issues.

Mechanisms for blue equity:

Mechanisms for turning the narrative of greater equity in aquaculture into practice, for helping shape policy and shifting dominant structures require further investigation and fine-tuning. Some approaches, can be double-edged and are disputed because they serve specific interests. Certification is a case in point, and in some forms, has been shown to exclude smaller farmers. Which forms of certification or other mechanisms – industry, government or civil society-led, or hybrid, could shake up current market governance and increase its function in increasing equitably human and social welfare?

It will be important here to ensure that aquaculture development is outward-looking: it is not the only user of aquatic resources, and equity issues can arise across sectors as well. Despite the growing popularity of the Blue Economy and the good intentions behind its development at national levels, there is much unknown about its outcomes and warnings have already been voiced (Farmery et al. 2021). If a theory of change around the development of a just and ‘humane’ blue economy was drawn, what place would be occupied by aquaculture, and what would be the assumptions behind its contributing role?

Trade-offs of transformation

Undoubtedly, acting on one human dimension will have impacts on others, as well as non-human dimensions. How can we ensure the overall outcome is desirable? Win-win solutions can be hard to find, or take a long time. Changes in practices may not always be positive for all either. If a way to have a more equitable aquaculture for the youth, will it also be more equitable for women and people with disabilities at the same time? Acting on the multiple levels of intersectionality, while minimizing the risk of trade-offs in benefits is likely to be difficult – but worthwhile – balancing exercise, requiring close monitoring and adaptive management.

Motors for change

Which are the “motors” that will fuel the desirable transformation: what will make the stakeholders change from business-as-usual? How does willingness weigh against necessity? Individual versus societal choices? Innovation can be motor for change, but changing attitudes in the long run is often a psychology affair. Seeking innovative collaborations and solutions, such as the incubation centers for the young graduates in partnership with financial institutions and farmers field schools promoted by the Government of Tanzania are one such example.

It is however likely that motors for change will vary across types of aquaculture operations. Which form (operated by cooperatives, family farms, large corporations), species (herbivorous, carnivorous, omnivorous, filter feeders or seaweed) are the most advanced (or backward) and hold the greatest potential for evolving the fastest towards more equality and human fulfilment? Will low-hanging fruits for greater human rights in aquaculture be sufficient to set the development of the sector on a new trajectory?

We encourage the reader to join us in our reflection and in moving our discussions forward, and in being part of the transformation and humanization of the aquaculture sector.

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