From checking boxes to actual improvement: A new take on sustainability certification

Vilde Steiro Amundsen

PII: S0044-8486(21)01335-1

DOI: https://doi.org/10.1016/j.aquaculture.2021.737672

Reference: AQUA 737672

To appear in: *aquaculture*

Received date: 5 June 2021

Revised date: 12 October 2021

Accepted date: 29 October 2021

Please cite this article as: V.S. Amundsen, From checking boxes to actual improvement: A new take on sustainability certification, *aquaculture* (2021), https://doi.org/10.1016/j.aquaculture.2021.737672

From Checking Boxes to Actual Improvement: A New Take on Sustainability Certification

*Vilde Steiro Amundsen

Studio Apertura, NTNU Samfunnsforskning

Dragvoll allé 38 B, 7049 Trondheim, Norway

Email: vilde.amundsen@samforsk.no

Phone: 0047 47854802
https://orcid.org/0000-0003-2104-3408

Abstract: Sustainability certification has established itself as an important approach to ensure responsible production, allowing retailers and consumers to differentiate between products while also providing companies in controversial industries with a means to demonstrate accountability. Based on interviews, fieldwork, and document studies of private sustainability

standards for the salmon aquaculture industry, this paper explores the implications of employing private, global regulatory instruments with standardized criteria to address such complex systems, and the potential for improved utilization of these instruments. The findings illustrate how a new conceptualization of certification, which moves away from a technocentric approach, is needed to ensure that the continuous development of these standards in fact constitutes improvement. What this calls for is abandoning the prevailing checkbox mentality, if certification is to remain such a dominating strategy to better aquaculture and other resource-intensive industries.

Keywords: sustainability; certification; standards; aquaculture

1. Introduction

Sustainability certification has become an increasingly common way in which to operationalize sustainability, a massively trending concept that is commonly used with little or no consideration as to what it actually involves (Portney, 2015). Due to its vague application, it has been necessary to give 'sustainability' content in the form of actions and aims, in order to know what should be done and how to assess that which is being done (Davidson, 2011; Rydin, 2007). However, the concretization of this mighty concept does influence what is associated with it, which in turn can shape continued efforts, from governments, civil society actors, and industries alike. Therefore, it is imperative that sustainability efforts, such as private sustainability standards, be examined. This should not merely involve the specific content of these standards, but also how they are implemented and the many impacts, both intended and unintended, of their growing prevalence (see e.g. Bailey et al., 2016; Challies, 2012; Gulbrandsen, 2009).

This paper builds on the work from the SustainFish project and the PhD thesis associated with this project (Amundsen, 2020), which investigated different aspects of private sustainability certification in salmon aquaculture, focusing on the industry in Norway, Chile, and Scotland. The work performed in this study has previously provided valuable insight into the implications of employing private regulatory instruments comprising standardized indicators and criteria, to address such complex systems. We have found that, through this approach, a technical understanding of certification manifests, which involves treating sustainability as a technical outcome that can be achieved through checklists of set targets. The complexity of the many challenges facing the aquaculture industry renders this approach insufficient, as seen

with the case of feed, where pressure to reduce marine ingredients to avoid irresponsible sourcing has led to criticism of deforestation from increased use of soy. Although checklists do serve a critical purpose by allowing comparability across sites, companies, and countries, a new conceptualization of certification is necessary if these private regulatory instruments are to have any significant impact on improving aquaculture and other resource-intensive industries.

In this paper, this new conceptualization is explored through a further analysis of the SustainFish data, examining the entirety of both quantitative and qualitative data in unison through a framework of impression, implementation, and impact. In doing so, I here delve into the many ramifications of this technical understanding and consider ways in which to address the inherent limitations of 'governing through indicators', while also taking advantage of its many strengths. With this, the paper provides crucial input for what a new conceptualization of certification should entail in order to provoke fruitful, fundamental changes in how these private governance tools are applied.

2. Theoretical background

'Sustainability' has infiltrated most business mission statements, strategies, and governmental policies (Alexander et al., 2015; Meld. St. 16, 2014; Portney, 2015), much due to the vague open-ended language associated with it (Moore, 2011). The process of making this abstract concept actionable can through a social constructivist perspective be understood as the construction of sustainability, building on the premise that this is not an objective concept, i.e. a given entity with determined and static characteristics (Rydin, 2007; Tlusty and Thorsen, 2017). As a defined construct, the concept of sustainability has provided a globally unifying mission and a universal language in which to discuss this mission (Moore, 2011; Portney, 2015). However, it serves a limited purpose if not specified into concrete aims and actions.

As with other vague ambitions, such as energy efficiency and economic development, sustainability is commonly operationalized through indicators, as is also the case with private sustainability standards. As indicators can provide simplified, quantifiable, and comparable data across locations, they serve to construct governable entities that can be controlled at a distance, making indicators what Foucault (2007) refers to as 'technologies of power'. This is a more recent manner of governing complex industries and systems, which is rooted in an ongoing shift away from the traditional regulatory model, where the state has been the

primary governing system. This shift involves decentralization of power and wider participation of non-state actors (Eliassen, 2016; Foucault, 2008; Kringen, 2018), through the encouragement of 'governing at a distance' (Rose and Miller, 1992) by the means of market-based mechanisms for regulation. In other words, this shift represents a broader understanding of terms such as regulation and governance, which have traditionally just been associated with state involvement (Thomann, 2017).

Private sustainability standards are part of this current governance trend, and are typically developed by certification schemes, which are often multi-stakeholder initiatives. These initiatives tend to be made up of different actor constellations of industry partners, NGOs, and retailers, which in turn accounts for the multitude and variety in standards that exist (Nilsen et al., 2018). Certification schemes are intended as a way in which to implement more sustainable practices within resource-intensive industries, by providing market-related incentives (Bush and Oosterveer, 2015; Tikina and Innes, 2008), such as price premium, market access, or risk management (Boyd and McNevin, 2012; Bronnmann and Asche, 2017; Bush et al., 2013a). Certification schemes often provide a number of standards, which can concern different issues pertaining to sustainability and different segments of the value chain (Bush and Roheim, 2019; Henson and Humphrey, 2012). Companies (or specific sites) can obtain a certification by complying with the indicator criteria of a specific standard and demonstrating this, typically through an audit process conducted by a third party. While such initiatives are private and therefore voluntary, many sustainability standards are becoming *de facto* mandatory, as increased demand for certified products renders companies reliant on obtaining these certifications (Stanton, 2012), thus illustrating the consequential role of non-state regulatory instruments.

2.1. Sustainability as a technical outcome

Being a controversial industry, aquaculture has many challenges that need to be addressed, with environmental and other interest groups, journalists, and consumers calling for changes (Osmundsen and Olsen, 2017; Schlag, 2010). For instance, there are concerns pertaining to environmental impacts from waste and emissions, disease, and fish escaping the facilities (Burridge et al., 2010; Olaussen, 2018; Thorstad and Finstad, 2018). Other challenges include source of feed (FAO, 2018; Sprague et al., 2016; Ytrestøyl et al., 2015), food safety (Sapkota et al., 2008), and privatization of marine commons (Tecklin, 2016). Some of these challenges are also affecting the industry's efforts to ensure continuation of profitable production, such

as high mortality rates and poor water quality (Vormedal and Gulbrandsen, 2018). However, improving the aquaculture industry is not just a matter of identifying which issues to address, but also discovering, and deciding on, the best measures with which to address these issues. There is much uncertainty and debate surrounding the impacts of aquaculture (Osmundsen et al., 2017; Schlag, 2010), and consequently what a 'sustainable' aquaculture industry would and should look like, complicating any improvement efforts.

While voluntary sustainability standards are becoming a continuously more prevalent private regulatory instrument for seafood (Alfnes et al., 2018), which also provides companies with a way of responding to the ever-increasing sustainability demands, the standards' actual impact and implications are subject to debate (Bush et al., 2013a; Vigneau et al., 2015). A major concern involves the approach itself, that 'governing through indicators' gives rise to the idea of sustainability as something to be achieved, and that this can be done through compliance with a set list of criteria (Boyd and McNevin, 2015; Busch, 2011a). Although sustainability is clearly a defined construct, the power of language should not be underestimated, as speaking of it as a given constant has implications for how sustainability initiatives are understood and employed. For instance, a danger with the perception of sustainability as a technical outcome, is that indicators themselves become the focus, rather than that of which they are meant to be an indication (Merry, 2011), with the risk of losing sight of material contextual factors and the larger issues at hand. An example of this is the forage fish dependency ratio indicator, which is intended to limit the amount of fishmeal and fish oil used in aquaculture feed, to avoid irresponsible harvest of forage fish. As previously described, efforts to achieve this has led to increased use of soy in the feed, which gives rise to a new set of challenges (Ytrestøyl et al., 2015). What this illustrates is the significance of which indicators are included in these standards, as these choices guide the spotlight of attention, shaping the common understanding of what is considered worth addressing and what is not (Levett, 1998).

The power of these choices is founded in the naturalization of these standards. This refers to the pervasive idea that these are neutral regulatory instruments (Busch, 2011b; Osmundsen et al., 2020b), leaving their intentions and efficacy taken for granted. An important strategy for achieving this is through black-boxing any conflicts or disagreements that may have occurred during the development process of these standards (Asdal, 2008; Merry, 2011; Strassheim and Kettunen, 2014). In doing so, these technologies of power are becoming an invisible infrastructure that change the way we think, fostering an unwarranted trust in numbers and standards (Porter, 2001). Although indicators do provide a much-needed simplification of a

complex reality, this becomes problematic when they are treated as actual representations of reality (Busch, 2011a; Merry, 2011). This is not to suggest that governing through indicators should be avoided, but it illustrates the importance of being attentive of how they are understood and consequently applied. The legitimacy of certification schemes and their standards are rooted in this perceived neutrality and objectivity, of both the standards themselves and the audit process (Busch, 2011a; Cook et al., 2016; Jensen and Winthereik, 2017), making it in their interest to strengthen this perception.

However, as much of the standardization and audit literature argues, the process of objectivation, i.e. of deciding what to measure and how, cannot be considered objective (Asdal, 2011; Hatanaka, 2014; Turnhout et al., 2014). In order for something to become governable, it must be made thinkable and actionable, which necessitates providing the larger idea with specific content (Rose and Miller, 1992; Rydin, 2007). Through this process of operationalization, active decisions must be made in terms of what to include and what not to include. Furthermore, it is argued that the audit process cannot be considered objective, as the work of the auditor involves translating local conditions into the standardized template developed by these schemes (Eden, 2008; Power, 2010). This need for translation illustrates the complexities involved in developing these standards and selecting appropriate indicators that capture the many local realities of aquaculture sites and companies. Furthermore, certain challenges are more difficult to measure and assess, such as complex and context-dependent social issues (Bush et al., 2013a). The fact that these certifications are voluntary further complicates the matter, as there are pragmatic considerations to be made as to the number of indicators that can be included without making the standard too burdensome or inconvenient for aquaculture companies. Indicators must also be manageable by the industry, in the sense that they cannot, for instance, be in conflict with national or local regulation, or be achieved at the expense of personnel safety (see e.g. Størkersen, 2012).

Through the decisions that are made in terms of which indicators to include and how these are to be assessed, certain actors are given rule-making authority, i.e. the power to shape and influence what 'sustainability', and in this case 'sustainable aquaculture', entails (Busch, 2017; Havice and Iles, 2015). This speaks to how standards cannot merely be seen or treated as epistemological categories, but also as ontological categories that transform our understanding of reality (Busch, 2017). This idea of standards being neutral and objective derives from a *technical understanding of certification*, which is centered on the perception that sustainability is a technical outcome to be achieved. This understanding encourages a

checkbox mentality, where the focus is limited to the indicators and only that which can be assessed through documentation and audits. Such a narrow field of vision risks less measurable or tangible issues being neglected, regardless of their importance (Boyd and McNevin, 2015). When issues that are more difficult to assess and control at a distance fall outside the purview of the auditors, it becomes difficult to ensure that actual changes are taking place within the companies in question (Tröster and Hiete, 2018). Furthermore, with the indicators and their set criteria being the main focus, this risks discouraging attempts at continuous improvement or innovation (Bush and Oosterveer, 2015; Samerwong et al., 2018). If these private regulatory instruments are to be used to their full potential, it is vital that the map does not become the terrain, thereby obscuring the primary objectives of these standards.

3. Materials and Methods

In order to capture the many different aspect of sustainability certification, the study has involved several different methods and data sources[1]. The indicators in standards for salmon aquaculture by eight of the most prevalent certification schemes were analyzed, totaling 1916 indicators. The schemes included Aquaculture Stewardship Council, GLOBALG.A.P., Global Aquaculture Alliance – Best Aquaculture Practices, BRC Global Standards, International Featured Standards, Scottish Salmon Producers' Organisation, Royal Society for the Prevention of Cruelty to Animals, and Friend of the Sea. We first conducted a content analysis (Osmundsen et al., 2020a), categorizing each indicator according to the issues addressed. This analysis was performed through an iterative process between coding of the indicators and repeated workshops with the project members. In doing so, we could identify the many topics that were addressed in the standards, as well as important issues related to sustainability that were not. Building on the Circles of Sustainability (James, 2015), a tool for making cities and communities more sustainable, we developed a reference model for sustainability in salmon aquaculture, the Wheel of Sustainability (see Figure 1). This model and its four domains[2] and 28 subdomains were used in the final coding of the indicators, providing a visual presentation of which issues were addressed and which were not.

[1] As this paper builds and expands on work performed in a now finalized research project, more detailed descriptions of the previous research activities can be founded in the project's published papers.

[2] Following James (2015), this model does not have a separate social domain because they are all social domains, as this all pertains to practices that are part of human activity and social life.

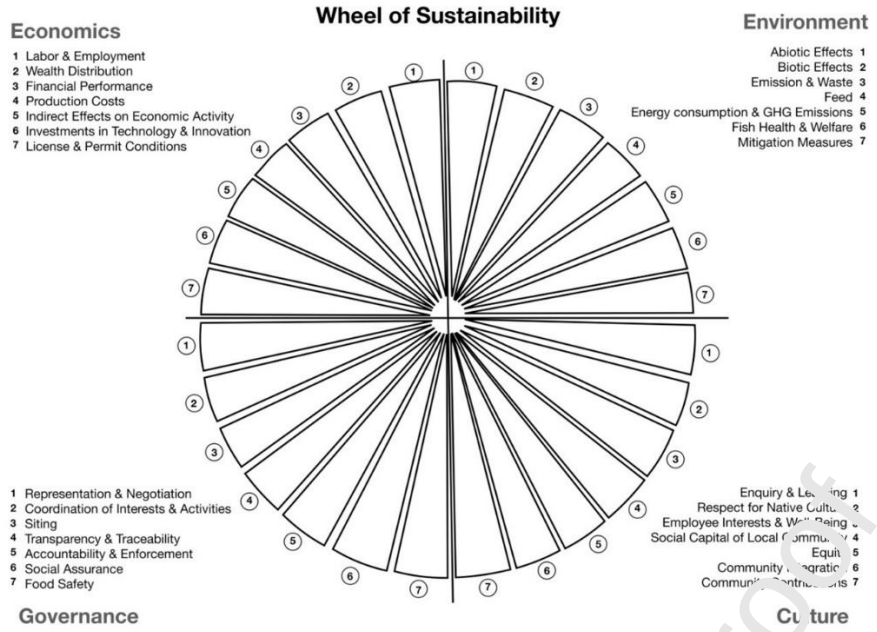

Figure 1: The Wheel of Sustainability with domains and subdomains

We also conducted a more in-depth analysis of the standard indicators related to what is traditionally associated with social sustainability (Alexander et al., 2020), in order to explore which issues they pertained to and the actions required to comply with these indicators. The social indicators were identified across the different domains based on a synthesized definition of social sustainability, which were developed by reviewing various definitions of Corporate Social Responsibility (CSR), Triple Bottom-Line (TBL), and Social License to Operate (SLO). This synthesized definition, which underscores the responsibilities of private corporations that spring from being both an employer and a social player, allowed us to identify the relevant subdomains from the Wheel of Sustainability. The indicators within these subdomains were then coded according to the specific area of focus and actions required for compliance.

The final indicator analysis concerned their level of impact (Amundsen et al., 2019). All 1916 indicators were coded according to the *level of criteria* (i.e. the level of compliance or scope of verification) and the *level of targeted impact*. This coding activity was performed to explore the common criticism that sustainability standards merely address issues at the site-level, and not cumulative environmental impacts or effects not directly associated with farm activities, as certification primarily pertains to individual sites (Boyd and McNevin, 2012; Bush et al., 2013a). Distinguishing between level of criteria and level of targeted impact provided a more nuanced understanding of the indicators and their level of impact, as the

potential reach of an indicator proved to not be limited to its level of compliance. By exploring the type of indicators with both site-level compliance *and* a broader targeted impact, we were able to shed light on the potential impact of site/company-level certification, if applied appropriately.

In addition to the document studies, we conducted multi-sited observational studies in Norway, in which we attended audits for three different certification scheme standards (Amundsen and Osmundsen, 2019). We also performed 22 in-depth interviews with aquaculture production companies in Norway, Chile, and Scotland (Amundsen and Osmundsen, 2020). Ten of the companies were located in Norway, six were in Chile and one was in Scotland. An auditor in Norway and one in Chile were also interviewed, in addition to informal interviews with company employees and auditors during the fieldwork. The purpose of the interviews and fieldwork was to gain insight into the implementation and impact of sustainability certification, and the workings of the certification process. The combination of these different methods and data sources proved valuable in understanding how sustainability is operationalized through the use of these standards.

Following the publication of these papers, I have conducted a further analysis of the data, exploring the different findings in relation to each other by examining the multiple sources of data in unison, with the intent of building and expanding on this work. As many of the project's findings point to challenges and inherent limitations of aquaculture sustainability certification, this additional analysis is intended as a more direct contribution to the way forward. This has involved seeing the content of the standards (i.e. what issues are addressed, how they are addressed) in relation to the interviews and observational data (e.g. how the standards are perceived, how they are implemented and assessed, etc.). A fruitful exercise for doing so included examining the data through the lens of different 'phases' of the certification process, categorizing the different findings within a framework of impression, implementation, and impact. In short, *impression* refers to how the choice of indicators to be included in these standards shapes how sustainability is understood. *Implementation* concerns the activities surrounding companies becoming certified, both within the organization and during the audit process. *Impact* covers the effects of sustainability certification, including unintended consequences.

Considering the different elements of sustainability certification within a framework of different 'phases' provided insight into the more structural and overarching implications of how these certifications are employed, but more importantly it also exposed the limitations of

treating this as a linear process. This has, in turn, shed light on the reciprocal influence and interplay between how the concept of sustainability is understood and the tools that are employed to 'achieve' it, allowing this study to produce practical input to the continued evolvement of this governance tool. In doing so, this work has become an effort to bridge the gap between research and application, by developing constructive recommendations for how to concurrently address limitations and exploit advantages of 'governing through indicators'.

4. Results

I will here present the key findings from the project's research activities, sorted according to the three 'phases', or perspectives. This is followed by lessons that can be drawn from the further analysis of the data, which will lay the foundation for the subsequent discussion on how to better utilize sustainability certification in the next section.

4.1. Impression

The *impression* of sustainability that is created through the choice of content in sustainability standards is important to explore due to the ontological power of these schemes and their standards. As the choices of which indicators to include in these standards have implications for which issues are perceived as worth addressing, it is imperative that the content of these standards is explored in detail. The content analysis of the 1916 indicators, which also resulted in the Wheel of Sustainability, showed that the majority of indicators addressed environmental and governance[3] related issues. 46 % of the indicators were coded as pertaining to environmental issues and 50 % to governance, while only 3 % pertained to the economic and 1 % to the cultural domain. Importantly, we found a major overlap between environmental and governance indicators, explained by the fact that a large proportion of the governance indicators serve to implement and legitimize environmental indicators, often through additional requirements of traceability and transparency. These findings demonstrate how environmental issues are largely prioritized by these schemes, illustrating a narrow operationalization of sustainability.

The additional analysis of indicators pertaining to social sustainability revealed that the 'social' indicators totaled 11 % of the 1916 indicators. When looking at the thematic area of

[3] In addition to state-level regulation, this category also includes practices and norms on the local and company level.

focus for these indicators, we found that they primarily address issues related to 1) the consequences that environmental impacts of aquaculture or the product have for the local community, 2) workers' rights, and 3) health and safety. As for the necessary actions for compliance, a clear majority of the social indicators merely require compliance with national law/legal commitments. The most common required actions following this are provision of documentation and establishment of a procedure or process. The overwhelming attention directed towards environmental impact and employees, as well as the compliance with national law as the predominant requirement, suggests that these sustainability standards can and should go further in addressing issues of social sustainability.

4.2. Implementation

Understanding how sustainability standards are *implemented* in salmon aquaculture companies is important due to the persistent emphasis on neutrality and objectivity of the certification process, despite research illustrating the contrary (Eden, 2008; Hatanaka and Busch, 2008; Power, 2010). Through interviews and fieldwork, we explored a key arena for where 'standard' meets 'reality', the audit process, and the necessary interpretation, adaptation, and translation of standardized criteria that occur in different local contexts. We found that the interaction that occurs between auditor and auditee, in the form of discussions, negotiations, and clarifications, is essential for this translation, as the criteria merely capture a fragment of companies' complex realities. This is especially relevant in the case of these international sustainability standards, where identical criteria and requirements are applied across different countries. For instance, Chilean respondents pointed to how some of the major standards base their criteria and required form of measurements primarily on the Norwegian industry, thereby challenging the process of translating their local conditions into the standard. The interaction between auditor and auditee was, however, often downplayed by both producers and auditors, much due to the fact that the legitimacy of the process is associated with its perceived objectivity. However, this human element of auditing is crucial for the process as a whole to be effective, as the translation between standard and local settings necessitates contextual input. Furthermore, much is still unknown with regards to the best ways in which to improve the industry and making it more sustainable, underlining the importance of the reciprocal knowledge production that occurs through these discussions and negotiations. By acknowledging its occurrence and value, this interaction can be utilized to better address the many issues at hand.

4.3. Impact

The impact of sustainability standards on the salmon aquaculture industry concerns both intended and unintended consequences of the proliferation of sustainability certification. This project investigated the viability of two common criticisms of certification's impact. Firstly, we addressed the concern of whether site and company-level certification can in fact have an impact on broader-reaching issues of aquaculture production, by exploring the specific demands and potential reach of the indicators. We found that while compliance (i.e. verification) of criteria mainly takes place at the site-level, the potential reach (i.e. targeted impact) of the majority of the indicators is at the regional, national, as well as global level. For example, several indicators concerning parasites or pathogens at the site also require participation in some form of area-based management scheme, thereby broadening their potential impact. Exploring these multi-level indicators more in-depth, we found that many of them had additional requirements related to traceability and coordination/sharing of information, often demanding some form of documentation. Through these added requirements, the schemes could extend both insight and accountability to a larger segment of the industry. Still, we also found that many challenges remain overlooked, such as issues related to transportation and distribution.

The second criticism concerned the technical approach applied by these schemes, and the limited impact that checklists of requirements can have on an organization. Based on interviews and fieldwork, we found that significant changes are in fact made as a result of obtaining these certifications, largely through the inclusion of new focus areas concerning environmental and social issues. In fact, both Chilean and Norwegian respondents described the criteria as more stringent than national regulations. While indicators pertaining to social issues, such as workers' rights and welfare, were considered more important in a Chilean context, private certifications were also described as a crucial supplement to Norwegian legislation, in ensuring worker health and safety. Importantly, the necessary changes made according to the standard criteria are mainly related to increased documentation and reporting, in all three countries. While this has been utilized as an important strategy to ensure accountability and transparency, it does not necessarily speak to actual changes being made within the organization. For sustainability certification to be effective, it is imperative that behavioral changes are made, which entails the internalization of responsible practices in the organization, as opposed to mere compliance with standard requirements. We argue that being

more oriented towards continuous improvement and allowing some degree of flexibility in the standards will better ensure behavioral changes in the company. For instance, several respondents sought more leniency when other practices than those asked for in a specific standard were found better suited due to local circumstances, calling for a focus on doing things better as opposed to merely doing them according to what a standard dictates. As for the companies, we identified several key facilitators for behavioral change within the organization: incorporating responsible practices as new routines, embracing new focus areas, implementing structures promoting continuous improvement, making employees conscious of the importance of sustainability, and implementing changes in the entire organization.

4.4. A technical understanding of certification

Analyzing the data through the lens of these three 'phases', we see that the *impression* of sustainability that is created through the choice of content in these sustainability standards is characterized by an overwhelming emphasis on environmental issues and limited capacity to properly address the many social issues of aquaculture. The *implementation* of sustainability standards is shown to be largely driven by the difficult balancing act between the preoccupation with neutrality and distance, and the need for discussions and negotiations. In exploring the *impact* of these sustainability standards, the study reveals many of the limitations of employing standardized indicators and criteria to achieve actual changes in the companies, as well as the potential reach of such indicators throughout the value chain.

However, applying this framework also exposes the interconnectedness of the three 'phases'. For instance, the impression of sustainability that is reinforced through the environmental focus in the standards has implications for the impact of the standards, as this leaves other issues neglected. Also, by forcing the importance of objectivity of auditors during audits (i.e. in the implementation process), this reinforces the impression of sustainability as a technical outcome. What this shows is that by treating certification as a linear process, and thereby ignoring this reciprocal influence between how the standards are developed, how they are implemented, and the impact they have, a technical understanding of certification manifests, where these standards are seen as mere technical instruments, as something neutral. The dangers of this technical understanding can be summarized through three interconnected misconceptions that follow this way of thinking: 1) sustainability is an achievable goal, 2) the 'road to sustainability' is something that is determined (i.e. something that just needs to be followed to reach this end-goal), and 3) sustainability standards are objective tools to achieve said end-goal. As will be further discussed in the next section, the way in which sustainability

is understood and treated can have considerable implications for how sustainability certification and similar efforts and initiatives are designed and applied. Therefore, gaining a better understanding of these implications and the way in which concept and action are interconnected is crucial for ensuring that the continuous development of these schemes in fact constitutes improvement.

5. Discussion

Sustainability as a concept has been immensely important in framing policy and stimulating initiatives for increased accountability and responsibility on the local, regional, and global level. While the ambiguous language typically associated with sustainability has been subject to criticism, it has also played a vital role in the proliferation and prominence of the concept (Moore, 2011), further reinforced by the UN Sustainable Development Goals. While it may be a given that sustainability is a defined construct, the fact that it is often presented and discussed as a given constant (as seen with the three misconceptions identified in this study) does have implications for sustainability efforts and their potential impact. When indicators become the primary focus, the map becomes the terrain, as constructed standards are treated as true representations of reality. The power of language, and its influential role in shaping policy and key decision-making processes, must therefore not be underestimated. For instance, speaking of sustainability in absolute terms is said to both impede innovation and create a false sense of security (Bush and Oosterveer, 2015; Tlusty and Thorsen, 2017), as it trivializes the value of continuous improvement. It can of course be argued that sustainability must be achievable on some fundamental level and that focusing on mere improvement towards some undefined goal will not suffice to achieve necessary changes. However, I would maintain that understanding and treating sustainability as an achievable goal has implications for the multitude of instigated sustainability efforts. Speaking about sustainability as a static end-goal to be reached suggests that there exists a given solution, which completely disregards the many complexities and necessary tradeoffs involved in improving aquaculture, or any other resource-intensive industry. Aquaculture production is characterized by much uncertainty with regards to understanding the actual impact of different processes and knowing which solutions are best to deal with these challenges (Osmundsen et al., 2017). Furthermore, there is much unknown concerning the potential interplay between various impacts and the potential strategies to mitigate them. In addition, this misconception ignores the diversity of challenges that different companies and sites face within this global industry,

as seen in the need for aquaculture companies to interpret and adapt the standard criteria to their local context.

Downplaying these many uncertainties and complexities reinforces the perception that standards and indicators can serve as objective representations of reality (Cook et al., 2016; Merry, 2011). Objectivity and neutrality continue to be considered pillars of the certification process, despite the fact that this is refuted by the multitude, variety, and complexity of the different local contexts that are to fit into one standardized template (Eden, 2008). This preoccupation with the objectivity of certification has ramifications for how audits are performed, as it necessitates downplaying the important role of interaction between auditor and auditee in translating local contexts into the standards. Furthermore, with the assumption of objectivity follows the dangers of a checkbox mentality (Boyd and McNevin, 2015; Merry, 2011), which limits attention and action to that which is measurable, countable, and controllable. This also fosters a sense of trust in these standards and in that the issues they address are those worthy of addressing. In the case at hand, the overwhelming focus on environmental issues may not only lead to other important issues being neglected within the aquaculture certification domain, but also within the common understanding of 'sustainability' and 'sustainable aquaculture'. This relates back to Busch's (2017) cautions concerning the ontological power of these standards and the implications of the choice of specific indicators to include in them. This underlines the importance of investigating those with the power of definition (Busch, 2017; Havice and Iles, 2015), bringing attention to the processes involved in setting the agenda for the industry, opening the black-box of standard development and negotiations.

When looking at the many challenges of sustainability certification and the use of standardized indicators to regulate such a complex industry as aquaculture, it is important to keep in mind the necessary pragmatic considerations to be made when selecting appropriate indicators that are also manageable. Firstly, many issues that the aquaculture industry struggles with are inherently complex and difficult to assess comparatively. Furthermore, as these sustainability certifications are private initiatives, and therefore voluntary, the complete list of criteria cannot be too comprehensive or burdensome. Moreover, different certification schemes are in competition with each other, further complicating each scheme's difficult balance of securing sufficient standard uptake while also ensuring credibility as a stringent and effective standard (Bush et al., 2013b). Importantly, while this study has identified several inherent limitations, the strengths and potential of governing through indicators should not be

diminished. Because indicators are standardized, simplified, and cross-contextual, this form of private governance offers opportunities for increased global accountability through far-reaching assessments and comparability. Furthermore, they enable companies to know what is expected of them and at which level. As for private sustainability certifications specifically, when discussing their limitations it is important to keep in mind that these standards are continuously updated. With many of them being multi-stakeholder initiatives, these revisions are better equipped to include more voices and consider the multitude of tradeoffs, thereby potentially addressing deficits of national regulations. It is therefore not advisable to abandon this approach, but rather embrace a new understanding of certification that plays to the strengths of 'governing through indicators', while also addressing its inherent limitations and necessary pragmatic considerations.

This new conceptualization and understanding of certification necessitates moving away from the belief that sustainability is an achievable goal, and rather treat it as a processual construction, which involves acknowledging the complexities and all that is unknown for improving the industry. This places the focus on continuous learning and knowledge-building, emphasizing relative rather than absolute improvement. This involves acknowledging the presence of necessary tradeoffs and difficult prioritizations, thereby stimulating continuous negotiation of the content of the standards. Furthermore, this approach demands sustained dialogue, emphasizing the importance of including more voices, to balance the many different needs and concerns. These voices should represent all relevant parties, for example actors across the full value chain (e.g. distributors, feed producers, suppliers), as well as affected communities and different interest groups. Finally, it requires recognizing the need for adaptation, negotiation and flexibility in translating local practices into the standardized templates of these schemes, thereby elevating the vital role of interaction between auditor and auditee in these processes. This necessitates refashioning the standards for flexibility, as well as providing auditors with the necessary discretionary space to make considered decisions based on available information and deliberations. Doing so will open up for crucial learning production between the different actors, to better capitalize on the immense knowledge of aquaculture producers, auditors, and standard creators. For such an approach to be made actionable and achievable, its principles must be reflected in the selected indicators. By developing indicators that allow and promote flexibility, continuous improvement, and stimulation of learning, certification schemes can better grapple with some of their key

challenges, thereby achieving better inclusion of more intangible issues and capturing the wider context of that which is being measured and assessed.

6. Concluding remarks

With this new approach, the role of certification is recognized as part of larger structures, events, and social relations, thereby rejecting the idea of static systems and shifting the focus towards the processes in which these systems are continuously created and negotiated. The conceptualization of certification advocated for in this paper stresses the role of flexibility, continuous improvement, and reciprocal knowledge production. This necessitates acknowledging the complexities involved, and seeing standards for what they are: simplifications of reality. The value of simplification in uniting ideas and efforts must be recognized, but if these standards are to serve their purpose, we must be aware of how we understand and apply them. As with the Wheel of Sustainability, while this is a simplified depiction of something undisputedly complex, treating it as a true representation of reality and what is to be 'achieved', would defy its purpose of being a reference model for reflection and deliberation.

This new approach is further a matter of including different voices with different interests and expertise, through dialogue and negotiation. While many certification schemes, both for aquaculture and others, are already doing versions of this, what I argue for here is changing our entire understanding of sustainability. By acknowledging all that is unknown and finding the best ways to learn and improve, these well-established and accepted systems can be far better utilized. Importantly, while this is a study of aquaculture certification, the findings can shed light on certification schemes for other industries, as much of what is discussed here pertains to elements that characterize private sustainability certifications in general. Furthermore, the findings are not merely applicable to sustainability certification, but sustainability efforts in general, as 'governing through indicators' has become the predominant approach for the majority of such initiatives, both public and private, with the same potential for improvement.

Funding: This research was funded by The Research Council of Norway, grant number 254841 (the SustainFish project).

Acknowledgments: *[to be provided after review]*

Credit Author Statement

Vilde Steiro Amundsen: Conceptualization; Formal analysis; Investigation; Methodology; Roles/Writing – original draft

For credit author statements for det previous work referenced, see the relevant papers.

Declaration of interests

☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

☐The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

References

Alexander, K.A., Amundsen, V.S., Osmundsen, T.C., 2020. "Social Stuff" and All that Jazz: Understanding the Residual Category of Social Sustainability. Environmental Science & Policy 112, 61–68. https://doi.org/10.1016/j.envsci.2020.06.003

Alexander, K.A., Potts, T.P., Freeman, S., Israel, D., Johansen, J., Kletou, D., Meland, M., Pecorino, D., Rebours, C., Shorten, M., Angel, D.L., 2015. The Implications of Aquaculture Policy and Regulation for the Development of integrated Multi-Trophic Aquaculture in Europe. Aquaculture 443, 16–23. https://doi.org/10.1016/j.aquaculture.2015.03.005

Alfnes, F., Chen, X., Richardtsen, K., 2018. Labeling Farmed Seafood: A Review. Aquaculture Economics & Management 22, 1–26. https://doi.org/10.1080/13657305.2017.1356398

Amundsen, V.S., 2020. In the Scheme of Things: Sustainability as Seen Through the Lens of Salmon Aquaculture Sustainability Standards (Doctoral dissertation). NTNU, Trondheim.

Amundsen, V.S., Gauteplass, A., Bailey, J., 2019. Level Up or Game Over: The Implications of Levels of Impact in Certification Schemes for Salmon Aquaculture. Aquaculture Economics & Management 1–17. https://doi.org/10.1080/13657305.2019.1632389

Amundsen, V.S., Osmundsen, T.C., 2020. Becoming Certified, Becoming Sustainable? Improvements from Aquaculture Certification Schemes as Experienced by those Certified. Marine Policy 119. https://doi.org/10.1016/j.marpol.2020.104097

Amundsen, V.S., Osmundsen, T.C., 2019. Virtually the Reality: Negotiating the Distance between Standards and Local Realities When Certifying Sustainable Aquaculture. Sustainability 11, 2603. https://doi.org/10.3390/su11092603

Ariffin, Y., 2007. Developmental and Environmental Policies: Past Trends, Present Issues, Future Prospects, in: de Senarclens, P., Kazancigil, A. (Eds.), Regulating Globalization - Critical Approaches to Global Governance. United Nations University Press, Tokyo, pp. 205–248.

Asdal, K., 2011. Politikkens natur - naturens politikk. Universitetsforl, Oslo.

Asdal, K., 2008. Enacting Things through Numbers: Taking Nature into Account/ing. Geoforum 39, 123–132. https://doi.org/10.1016/j.geoforum.2006.11.004

Bailey, M., Bush, S.R., Miller, A., Kochen, M., 2016. The Role of Traceability in Transforming Seafood Governance in the Global South. Current Opinion in Environmental Sustainability 18, 25–32. https://doi.org/10.1016/j.cosust.2015.06.004

Boyd, C.E., McNevin, A.A., 2015. Aquaculture, Resource Use, and the Environment. John Wiley & Sons, Inc, Hoboken, New Jersey.

Boyd, C.E., McNevin, A.A., 2012. An Early Assessment of the Effectiveness of Aquaculture Certification and Standards, in: Toward Sustainability: The Roles and Limitations of Certification. RESOLVE, Inc, Washington, DC.

Bronnmann, J., Asche, F., 2017. Sustainable Seafood from Aquaculture and Wild Fisheries: Insights From a Discrete Choice Experiment in Germany. Ecological Economics 142, 113–119. https://doi.org/10.1016/j.ecolecon.2017.06.005

Burridge, L., Weis, J.S., Cabello, F., Pizarro, J., Bostick, K., 2010. Chemical Use in Salmon Aquaculture: A Review of Current Practices and Possible Environmental Effects. Aquaculture 306, 7–23. https://doi.org/10.1016/j.aquaculture.2010.05.020

Busch, L., 2017. Standards and Their Problems: From Technical Specifications to World-Making, in: Transforming the Rural, Research in Rural Sociology and Development. Emerald Publishing Limited, pp. 97–114. https://doi.org/10.1108/S1057-192220170000024005

Busch, L., 2011a. Standards: Recipes for Reality. MIT Press, Cambridge, Mass.

Busch, L., 2011b. Climate Change: How Debates over Standards Shape the Biophysical, Social, Political and Economic Climate. International Journal of Sociology of Agriculture and Food 18, 167–180.

Bush, S.R., Belton, B., Hall, D., Vandergeest, P., Murray, F.J., Ponte, S., Oosterveer, P., Islam, M.S., Mol, A.P.J., Hatanaka, M., Kruijssen, F., Ha, T.T.T., Little, D.C., Kusumawati, R., 2013a. Certify Sustainable Aquaculture? Science 341, 1067–1068. https://doi.org/10.1126/science.1237314

Bush, S.R., Oosterveer, P., 2015. Vertically Differentiating Environmental Standards: The Case of the Marine Stewardship Council. Sustainability 7, 1861–1883. https://doi.org/10.3390/su7021861

Bush, S.R., Roheim, C.A., 2019. The Shifting Politics of Sustainable Seafood Consumerism, in: Boström, M., Micheletti, M., Oosterveer, P. (Eds.), The Oxford Handbook of Political Consumerism. Oxford University Press, pp. 330–348. https://doi.org/10.1093/oxfordhb/9780190629038.013.16

Bush, S.R., Toonen, H., Oosterveer, P., Mol, A.P.J., 2013b. The 'Devils Triangle' of MSC Certification: Balancing Credibility, Accessibility and Continuous Improvement. Marine Policy 37, 288–293. https://doi.org/10.1016/j.marpol.2012.05.011

Challies, E., 2012. The Limits to Voluntary Private Social Standards in Global Agri-food System Governance. International Journal of Sociology of Agriculture and Food 20, 175–195.

Cook, W., van Bommel, S., Turnhout, E., 2016. Inside Environmental Auditing: Effectiveness, Objectivity, and Transparency. Current Opinion in Environmental Sustainability 18, 33–39. https://doi.org/10.1016/j.cosust.2015.07.016

Davidson, K.M., 2011. Reporting Systems for Sustainability: What Are They Measuring? Social Indicators Research 100, 351–365. https://doi.org/10.1007/s11205-010-9634-3

Eden, S., 2008. Being Fieldworthy: Environmental Knowledge Practices and the Space of the Field in Forest Certification. Environment and Planning D: Society and Space 26, 1018–1035. https://doi.org/10.1068/d3208

Eliassen, K.O., 2016. Foucaults begreper. Scandinavian Academic Press, Oslo.

FAO, 2018. The State of World Fisheries and Aquaculture 2018 - Meeting the Sustainable Development Goals. Rome.

Foucault, M., 2008. The Birth of Biopolitics: Lectures at the Collège de France, 1978-79. Palgrave Macmillan, Basingstoke, England; New York.

Foucault, M., 2007. Security, Territory, Population: Lectures at the Collège de France, 1977-78. Palgrave Macmillan : République Française, Basingstoke ; New York.

Gulbrandsen, L.H., 2009. The Emergence and Effectiveness of the Marine Stewardship Council. Marine Policy 33, 654–660. https://doi.org/10.1016/j.marpol.2009.01.002

Hatanaka, M., 2014. Standardized Food Governance? Reflections on the Potential and Limitations of Chemical-Free Shrimp. Food Policy 45, 138–145. https://doi.org/10.1016/j.foodpol.2013.04.013

Hatanaka, M., Busch, L., 2008. Third-Party Certification in the Global Agrifood System: An Objective or Socially Mediated Governance Mechanism? Sociologia Ruralis 48, 73–91. https://doi.org/10.1111/j.1467-9523.2008.00453.x

Havice, E., Iles, A., 2015. Shaping the Aquaculture Sustainability Assemblage: Revealing the Rule-Making Behind the Rules. Geoforum 58, 27–37. https://doi.org/10.1016/j.geoforum.2014.10.008

Henson, S., Humphrey, J., 2012. Private Standards in Global Agri-Food Chains, in: Marx, A., Maertens, M., Swinnen, J., Wouters, J. (Eds.), Private Standards and Global Governance. Economic, Legal and Political Perspectives, Leuven Global Governance. Edward Elgar Publishing Limited, Cheltenham, UK, pp. 98–113.

James, P., 2015. Urban Sustainability in Theory and Practice: Circles of Sustainability, Advances in Urban Sustainability. Routledge, Taylor & Francis Group: Earthscan, from Routledge, Abingdon, Oxon; New York, NY.

Jensen, C.B., Winthereik, B.R., 2017. Audit Loops and Audit Implosion, in: Lebner, A. (Ed.), Redescribing Relations, Strathernian Conversations on Ethnography, Knowledge and Politics. Berghahn Books, New York, pp. 155–181.

Kringen, J., 2018. Regulering, standardisering, normering: terminologi, typologier og egenskaper, in: Lindøe, P.H., Kringen, J., Braut, G.S. (Eds.), Regulering Og Standardisering - Perspektiver Og Praksis. Universitetsforlaget, Oslo, pp. 27–49.

Levett, R., 1998. Sustainability Indicators-Integrating Quality of Life and Environmental Protection. Journal of the Royal Statistical Society: Series A (Statistics in Society) 161, 291–302. https://doi.org/10.1111/1467-985X.00109

Meld. St. 16, 2014. Forutsigbar og miljømessig bærekraftig vekst i norsk laks- og ørretoppdrett. Oslo: Nærings- og Fiskeridep.

Merry, S.E., 2011. Measuring the World: Indicators, Human Rights, and Global Governance. Current Anthropology 52, S83–S95. https://doi.org/10.1086/657241

Moore, F.C., 2011. Toppling the Tripod: Sustainable Development, Constructive Ambiguity and the Environmental Challenge. Consilience: The Journal of Sustainable Development 5, 141–150. https://doi.org/10.7916/D8668CW6

Nilsen, M., Amundsen, V.S., Olsen, M.S., 2018. Swimming in a Slurry of Schemes: Making Sense of Aquaculture Standards and Certification Schemes, in: Haugen, S., Barros, A., van Gulijk, C., Kongsvik, T., Vinnem, J.E. (Eds.), Safety and Reliability – Safe Societies in a Changing World. Taylor & Francis Group, London, pp. 3149–3156.

Olaussen, J.O., 2018. Environmental Problems and Regulation in the Aquaculture Industry. Insights from Norway. Marine Policy 98, 158–163. https://doi.org/10.1016/j.marpol.2018.08.005

Osmundsen, T.C., Almklov, P., Tveterås, R., 2017. Fish Farmers and Regulators Coping with the Wickedness of Aquaculture. Aquaculture Economics & Management 1–21. https://doi.org/10.1080/13657305.2017.1262476

Osmundsen, T.C., Amundsen, V.S., Alexander, K.A., Asche, F., Bailey, J., Finstad, B., Olsen, M.S., Hernández, K., Salgado, H., 2020a. The Operationalisation of Sustainability: Sustainable Aquaculture Production as Defined by Certification Schemes. Global Environmental Change 60, 102025. https://doi.org/10.1016/j.gloenvcha.2019.102025

Osmundsen, T.C., Olsen, M.S., 2017. The Imperishable Controversy over Aquaculture. Marine Policy 76, 136–142. https://doi.org/10.1016/j.marpol.2016.11.022

Osmundsen, T.C., Olsen, M.S., Thorvaldsen, T., 2020b. The Making of a Louse - Constructing Governmental Technology for Sustainable Aquaculture. Environmental Science & Policy 104, 121–128. https://doi.org/10.1016/j.envsci.2019.12.002

Porter, T.M., 2001. Trust in Numbers: The Pursuit of Objectivity in Science and Public Life. Princeton University Press, Princeton.

Portney, K.E., 2015. Sustainability, MIT Press essential knowledge series. London, England : The MIT Press, Cambridge, Massachusetts.

Power, M., 2010. The Audit Society: Rituals of Verification, Reprinted. ed. Oxford Univ. Press, Oxford.

Rose, N., Miller, P., 1992. Political Power beyond the State: Problematics of Government. The British Journal of Sociology 43, 173–205.

Rydin, Y., 2007. Indicators as a Governmental Technology? The Lessons of Community-Based Sustainability Indicator Projects. Environment and Planning D: Society and Space 25, 610–624. https://doi.org/10.1068/d72j

Thomann, E., 2017. The Notions of Regulation and Self-Regulation in Political Science. Journal of Self-Regulation and Regulation 55-75 Pages. https://doi.org/10.1[illegible]88/JOSAR.2017.0.40136

Samerwong, P., Bush, S.R., Oosterveer, P., 2018. Implications of Multiple National Certification Standards for Thai Shrimp Aquaculture. Aquaculture 493, 312–327. https://doi.org/10.1016/j.aquaculture.2018.01.019

Sapkota, A., Sapkota, A.R., Kucharski, M., Burke, J., McKenzie, S., Walker, P., Lawrence, R., 2008. Aquaculture Practices and Potential Human Health Risks. Current Knowledge and Future Priorities. Environment International 34, 1215–1226. https://doi.org/10.1016/j.envint.2008.04.009

Schlag, A.K., 2010. Aquaculture: An Emerging Issue for Public Concern. Journal of Risk Research 13, 829–844. https://doi.org/10.1080/13669871003660742

Sprague, M., Dick, J.R., Tocher, D.R., 2016. Impact of Sustainable Feeds on Omega-3 Long-Chain Fatty Acid Levels in Farmed Atlantic Salmon, 2006–2015. Scientific Reports 6. https://doi.org/10.1038/srep21892

Stanton, G.H., 2012. Food Safety-Related Private Standards: The WTO Perspective, in: Marx, A., Maertens, M., Swinnen, J., Wouters, J. (Eds.), Private Standards and Global Governance. Economic, Legal and Political Perspectives, Leuven Global Governance. Edward Elgar Publishing Limited, Cheltenham, UK, pp. 235–254.

Strassheim, H., Kettunen, P., 2014. When Does Evidence-Based Policy Turn into Policy-Based Evidence? Configurations, Contexts and Mechanisms. Evidence & Policy: A Journal of Research, Debate and Practice 10, 259–277. https://doi.org/10.1332/174426514X13990433991320

Størkersen, K.V., 2012. Fish First: Sharp End Decision-Making at Norwegian Fish Farms. Safety Science 50, 2028–2034. https://doi.org/10.1016/j.ssci.2011.11.004

Tecklin, D., 2016. Sensing the Limits of Fixed Marine Property Rights in Changing Coastal Ecosystems: Salmon Aquaculture Concessions, Crises, and Governance Challenges in Southern Chile. Journal of International Wildlife Law & Policy 19, 284–300. https://doi.org/10.1080/13880292.2016.1248647

Thorstad, E.B., Finstad, B., 2018. Impacts of Salmon Lice Emanating from Salmon Farms on Wild Atlantic Salmon and Sea Trout (No. 1449). Norsk institutt for naturforskning (NINA), Trondheim, Norway.

Tikina, A.V., Innes, J.L., 2008. A Framework for Assessing the Effectiveness of Forest Certification. Canadian Journal of Forest Research 38, 1357–1365. https://doi.org/10.1139/X08-011

Tlusty, M.F., Thorsen, Ø., 2017. Claiming Seafood is 'Sustainable' Risks Limiting Improvements. Fish and Fisheries 18, 340–346. https://doi.org/10.1111/faf.12170

Tröster, R., Hiete, M., 2018. Success of Voluntary Sustainability Certification Schemes – A Comprehensive Review. Journal of Cleaner Production 196, 1034–1043. https://doi.org/10.1016/j.jclepro.2018.05.240

Turnhout, E., Neves, K., de Lijster, E., 2014. 'Measurementality' in Biodiversity Governance: Knowledge, Transparency, and the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (Ipbes). Environment and Planning A: Economy and Space 46, 581–597. https://doi.org/10.1068/a4629

Vigneau, L., Humphreys, M., Moon, J., 2015. How Do Firms Comply with International Sustainability Standards? Processes and Consequences of Adopting the Global Reporting Initiative. Journal of Business Ethics 131, 469–486. https://doi.org/10.1007/s10551-014-2278-5

Vormedal, I., Gulbrandsen, L.H., 2018. Business Interests in Salmon Aquaculture Certification: Competition or Collective Action? Regulation & Governance. https://doi.org/10.1111/rego.12213

Ytrestøyl, T., Aas, T.S., Asgård, T., 2015. Utilisation of Feed Resources in Production of Atlantic Salmon (Salmo Salar) in Norway. Aquaculture 448, 365–374. https://doi.org/10.1016/j.aquaculture.2015.06.023

Highlights

- A new conceptualization of sustainability certification is needed.
- Sustainability should not be treated as a technical outcome to be achieved.
- Indicators should allow and promote flexibility and continuous improvement.