

Sustainable aquaculture in Canada: lost in translation

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Q&A with the authors

Why did you do this study?

Beginning in 1992, Canada along with many other countries began signing on to a series of international agreements to promote sustainable development a new economic model for the world. Sustainable development is sometimes referred to as the 3 Ps (People, Planet, Profits) or more simply as the 3Ws (win, win, win). Sustainable development became a policy requirement in all federal departments responsible for natural resource management including aquaculture. This involved developing indicators that would measure the progress they were making to meet their sustainable development goals. Given Canada's longstanding support and commitment to sustainable development and almost 4 decades of aquaculture development, we decided to examine three questions regarding the sustainability of aquaculture in Canada: 1) what indicators is the federal government using to assess the social, economic and environmental sustainability of aquaculture production; 2) do these indicators adequately measure policy outcomes; and 3) are national-level indicators appropriate or relevant to assessing aquaculture's sustainability at the community-level?

What is an indicator?

People come in contact or rely on indicators everyday such as bank and mortgage rates, gas prices, weather reports. The simple definition of an indicator is a measure or gauge of the state, level or trend of something. An example of a policy indicators is Canada's Healthy Coasts and Ocean policy which has a goal or target to protect 10% of coastal and marine areas through a networks of protected areas . Or Canada's Climate policy is to reduce greenhouse gas emissions by 30% by 2030 relative to 2005 emission levels.

How did you do go about answering these questions?

We first examined the published literature on sustainability indicators and what makes a good indicator. There is wide agreement that in order for an indicator to be meaningful it needs to have a measurable target associate with it so that it will show movement towards or away from a stated policy objective. The literature also points to some common pitfalls associated with the selection of indicators such as selecting indicators that are easy to measure rather than what is important, selecting indicators that reflect a particular sector interest rather than a larger societal interest, and the geographic scale at which indicators are measured matters. For example, most people would agree that national employment data tell us very little about employment levels in small rural communities so it is important to have indicators that measure outcomes at different geographic scales. We then examined the SI developed by the federal government to assess the sustainability of the aquaculture sector. We used a case

study to examine how federal sustainable aquaculture policies and programs have been experienced at the community level.

What did you find?

In 2012, DFO outlined 11 potential sustainability indicators in a report titled, *Aquaculture Sustainability Reporting Initiative*. Since then, none of these indicators have moved from concept to implementation. Instead, DFO reports on industry's compliance with environmental regulations as an indicator of the sustainability of aquaculture. Their rationale for this indicator was that regulations are intended to limit environmental damage and the degree to which aquaculture operations comply with regulations is an indication of their environmental impact. In other words, if a fish farm complies with the regulations, it must not be having an impact on the environment. This approach assumes two things: that the regulations address the wide range of potential environmental impacts fish farms can have on other species and the ecosystem and, second, it assumes that simply reporting the results of benthic monitoring, drug and pesticide use or dead fish measures sustainability and impacts. It's like a doctor reporting the results of your medical tests but not telling you whether you have a health problem or not. For example, the fact that marine finfish operators in Canada reported using 14.4 mt of antibiotics and 439 mt of hydrogen peroxide pesticides in 2017 tells policy-makers, regulators and the public nothing about the sub-lethal, cumulative, and far-field (meaning beyond the farm lease) impacts of serial exposure to antibiotics and pesticides on non-target species. It's similar for reporting sulphide or bacterial levels resulting from fish farm waste discharges. Reporting the results of monitoring is not the same as measuring impacts or sustainability.

What did your case study tell you?

We used the result of more than 10 years of research focused on a single fish farm in Port Mouton Bay to examine how Canada's national policy goals for sustainable aquaculture played out at the community level. The case study illustrates the inadequacy of DFO's compliance indicator as a measure of aquaculture's environmental sustainability and questions the assumption that compliance with regulation equals environmental protection. For example, Canada's new aquaculture regulations do not address the lobster catch decreases, eelgrass loss, metal (copper) contamination or nutrient loading reported in the studies done in Port Mouton Bay. We also found that the economic multiplier effect - meaning indirect and spin-off jobs and revenue - generated from having a fish farm in a community did not apply to Port Mouton and most communities in Atlantic Canada and DFO's social sustainability goal of generating meaningful employment in rural, remote and coastal communities has not occurred. Even though finfish production in Nova Scotia has increased 1000% between 1995 and 2017, it employs the same number of full-time people and there has been an 86% drop in part-time employment.

Why is this study important?

Indicators in general are important for policy and public accountability. It's why governments have a wide range of measures within each policy domain such as employment, health, education, crime etc. Since sustainable development is such a significant policy objective in Canada, strong and rigorous evidence-based validation through sustainability indicators are necessary otherwise long-lasting policy narratives such as aquaculture's role in increasing food security, rural employment, and its benign impact on the environment risk being reduced to mere political catchphrases.

What else did your study find?

Our study found that indicators of social sustainability were the least developed. Social indicators address, among other issues, meaningful citizen participation in decision-making. As the world, Canada, and maritime provinces embrace and pursue what is being called Blue Growth, developing meaningful processes for citizen participation in decision-making will become a central issue in sustainability. The Blue Growth agenda is the most recent global sustainable development policy initiative and it was advanced in 2012 by high-level international agencies such as the UN, World Bank, and the OECD and is being picked up by countries such as Canada. The goal of Blue Growth is to promote ocean development beyond established marine industries such as fisheries, shipping, and tourism to industries such as deep seabed mining, pharmaceuticals and aquaculture. Merely providing communities with industry-led open houses or consultation sessions is not a measure of meaningful participation in local decision-making nor a measure of social sustainability but rather an item on a regulatory checklist much like reporting drug and pesticide use. Both government and industry have talked about social license to operate (SLO) and it was mentioned in the 2014 Doelle-Lahey report commissioned by the Nova Scotia government. However, SLO is not a legally binding agreement but an undefined process by which an industry attempts to acquire the informal consent of a community to operate in the community. DFO has yet to develop an objective measure or indicator to assess when, and if, SLO has been achieved.

So who is measuring the sustainability of aquaculture?

Indicator development in aquaculture, as well as fisheries and seafood in general, is now largely the domain of certification and labelling schemes administered by industry and retailers and a range of non-governmental organizations (NGOs) (e.g. Global Aquaculture Alliance/Best Aquaculture Practices, International Featured Standards, BRC Global Standards, Global Good Agricultural Practices, Aquaculture Stewardship Council, Friends of the Sea, etc). This reflects a broader trend that sees governments devolving certain elements of public policy and decision-making to non-state actors. A weakness in industry certification schemes is the near-absence of indicators associated with community-level decision-making and the lack of thresholds or targets for environmental indicators. The market-orientation in industry certification schemes is strongly reflected in what certifiers define as key social or governance issues (e.g. traceability, enforcement, food security). This also highlights one of

the pitfall in selecting indicators - selecting indicators that reflect a particular sector interest rather than a larger societal interest.

What are the indicators identified in the DFO 2012 report?

Compliance as a measure of aquaculture's environmental sustainability was never identified in the original list of potential indicators. The original list had six potential environmental indicators: escaped fish, water quality and benthic monitoring, disease incidence, responsible sourcing of marine raw materials, marine ingredients in aquaculture feed. There were two potential social indicators: employment and value chain traceability which relates to the goal of ensuring safe and healthy aquaculture production; and two economic indicators: amount of labour income generated both direct, indirect and induced and return on investment(ROI), a measure of the viability of the industry, not the government's investment in industry. None of these 11 potential indicators were developed in real measures with numerical targets.

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