

Innovative and Knowledge Developments for Sustainability in Salmon-Based Aquaculture

Knut Ingar Westernen

Norwegian University of Science and Technology, Norway

EXECUTIVE SUMMARY

Coastal marine salmon-based aquaculture has grown considerably in produced volumes in recent years, and projections from FAO lay out possibilities for further increases. This can only be done by introducing stronger restrictions on sustainability, including fish health and environmental regulations. To solve environmental problems, the Norwegian aquaculture company Midt-Norsk Havbruk (now Salmonor AS) received development permits in 2017 for a project based on Aquatraz semi-closed steel cages. The study is based on documentation from the Aquatraz project and interviews with employees at Midt-Norsk Havbruk. The project has mainly been successful, as in the fourth generation of the Aquatraz cage put in operation in 2021/22 delousing was not required and escape did not take place. The projects also showed how knowledge management (KM) procedures were successfully changed during implementation of new innovative technologies, the main reason for this being a flat organizational structure and focus on training and upgrading of knowledge levels and dissemination.

AQUACULTURE AND SUSTAINABILITY IN A GLOBAL CONTEXT

Introduction

The situation for aquaculture has long been analyzed by the Food and Agriculture Organization (FAO) and the latest reports on global developments can be found in Bartley (2022), FAO (2018), and, with a special focus on sustainability, FAO (2020). In this report, the FAO discusses the relationship between the UN Sustainable Development Goals (SDGs) and developments in fishing and aquaculture. The FAO (2020, p. vi) states that “The fisheries and aquaculture sector has much to contribute to securing all the SDGs but is at the core of SDG 14 – Conserve and sustainably use the oceans, seas and marine resources

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for sustainable development.” Furthermore, we find in many FAO documents, such as FAO (2022), that sustainable aquaculture will contribute to most of the UN’s SDGs. Implementation is now in the hands of the individual countries and the FAO’s (2021) view on how this must be done is:

- *Better governance*
- *Increased investment*
- *Targeted support to environmentally-friendly production.* (p. 36)

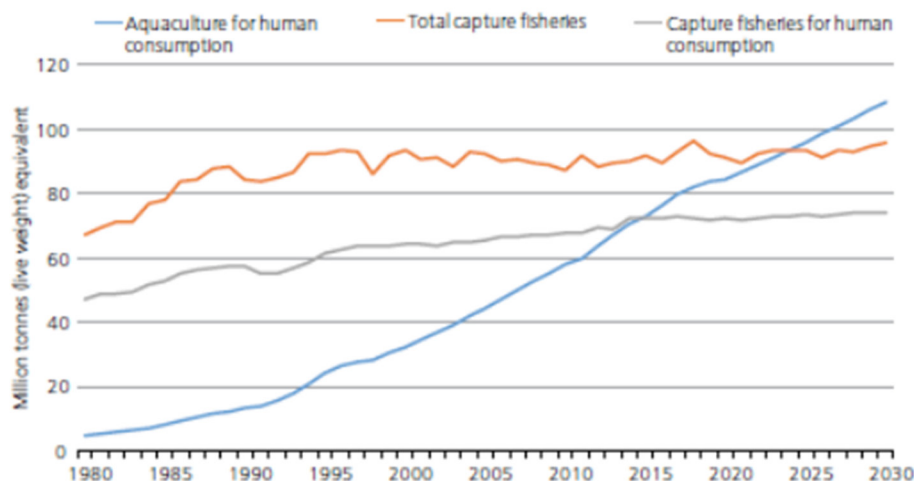
Effective management systems that lead development in a sustainable direction are the key measures to achieving innovative investments that contribute to sustainable production, which gives rise to the following research questions:

- What are the sustainability problems for aquaculture in marine coastal areas when producing salmon and trout?
- How do we understand the concept of sustainability in an innovation and knowledge transfer context in aquaculture?
- How can innovative projects like Aquatraz contribute to solving sustainability problems with sea lice and escape and, at the same time, implement innovations and knowledge management (KM) procedures?

The Resource Situation

Commercial fishing in salt and fresh water has levelled off in produced volumes from around 1990, and aquaculture has taken over and is the form of production that is accounting for the increase in the production of food from marine sources to meet the needs of a growing population, see Figure 1.

Figure 1. Worldwide developments in commercial fishing and aquaculture 1980–2018, mill. tons
Source: Bartley (2022, p. 1)



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