

## Responsible Living Lab in the Salmon Farming Industry

**SALMANSVAR** | Responsible Innovation in the Norwegian Salmon Farming Industry: Grand Societal Challenges, Dilemmas, and Improvements, HVL.

**AFINO** | Responsible Research and Innovation in Norway

**KABIS** | Capacity-lift for Sustainable and Innovative Aquaculture Production

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### Introduction

To test, trial and improve the procedures of responsible innovation in practice, the SALMANSVAR project have set up a Responsible Innovation Lab enabling co-creation of knowledge between participating researchers, firms, suppliers and customers, NGOs and regulating authorities. In the first two years of the SALMANSVAR project, during the Covid Pandemic closedown, the Lab had to be organized as webinars. Together with KABIS, SALMANSVAR organized several *Impact Forums* or webinars including representatives from the salmon industries (key production firms, start-ups, suppliers etc), and academic institutions.

When the Covid Pandemic closedown ended we started to plan a Responsible Innovation Lab together with NIFU (Nordisk Institutt for studier av Innovasjon, Forskning og Utdanning) for a wider and more diverse stakeholder group. In September 2002, SALMANSVAR, in collaboration with AFINO-NIFU (Nordisk Institutt for studier av Innovasjon, Forskning og Utdanning) and KABIS, organized a Responsible Living Lab. The lab was titled “Future Literacy Lab on the Norwegian salmon farming industry” and aimed to explore different narratives and scenarios, and related imagined outcomes associated with salmon farming activities in Norway. Applying the “Futures Literacy Learning Lab methodology”, firms, central regulatory bodies, R&D institutions and relevant NGOs, etc. were invited to reflect on the social, economic, ethical and governance aspects of the industry.

**Table 1: Responsible Living Lab program**

Time	Activity
09:15-09:30	Welcome/About Future literacy labs
09:30-10:30	Session 1: Hope scenarios
10:30-11:30	Session 2: Realistic scenarios
11:30-12:30	Lunch
12:30-13:30	Session 3: Reframing scenarios
13:30-14:00	Reporting and closing

### Methodology

The Futures Literacy Learning Lab methodology includes three sessions (see table 1) starting with a *Hope scenarios* session in which the participants are asked to discuss how they see the salmon industry

in a future best-case scenario. Accordingly, this session should encourage narrative production representing hope, prospects, and visions on how we would like to see the industry operate in an ideal future perspective. In the *Realistic scenarios* session, participants are asked to reflect on the “real” challenges, concerns and the current decisions being made by the industry, the government, etc. In the final *Reframing scenarios* session, the Lab challenges the mindsets behind the scenarios exposed in the two first sessions, by introducing an alternative future scenario.

### Responsible Living Lab in the Salmon Farming Industry

The Lab gathered 18 participants with various backgrounds and expertise, representing different stakeholder groups (see table 2). SALMANSVAR facilitated the venue and coordinated the Lab activities, the KABIS network served as a recruitment instrument engaging industry stakeholders, while NIFU monitored the Lab based on UNESCOs “Futures Literacy Learning Lab guidelines”. The aim of the Lab was to encourage discussions allowing for interchange of ideas and concerns across sectors. The objective of the LAB was to challenge established mindsets and stimulate reflections around how current challenges facing the industry can be solved in a responsible and innovative manner.

After a general description of the methodology, the participants were divided in two groups allowing for roundtable discussions. During all three sessions, key words representing narratives and scenarios, and related imaging outcomes were written on sticky notes before the notes were made visible to everyone. The two first sessions were completed with a short break in between, followed by lunch before the third session. The reframing conditions were presented in plenary, and the participants returned to their groups. Final reporting and closing were finished jointly.

During the *Hope scenarios* session, participants provided several ideas about how they wished the industry would be. Besides naming the need to diminish several diseases, most thoughts centred on sustainable issues such as salmon lice and the need to stop salmon escapees. An important element in this session was devoted to new feed alternatives, making the industry independent of imported soy causing deforestation in the Amazon Region in Latin America. Moreover, a hope of diminishing the industry’s current carbon footprint when trading salmon globally. There was a large emphasis in visualizing a highly technical and technologically well-equipped industry, with minimum bureaucratic obstacles and hopes for strong political support. An important idea was visualizing a confident and well-informed market that could appreciate and know the real impact of the industry and its overall achievements on food and social environmental standards and expectancies.

**Table 2: List of participating stakeholders.**

Høgskolen på Vestlandet	Lerøy Seafood Group	Norges Miljøvernforbund	Fiskeridirektoratet
DNB Bank ASA	STIM AS	VIS	Mohn Centre HVL
Salmona AS	Mattilsynet	Mowi	NIFU
Dyrkbart AS	Bremnes Seashore	Fiskeridirektoratet	NIFU
Mohn Centre HVL	Fiskeridirektoratet	VIS	

In the *Realistic scenarios* session, the discussion centred mostly on the obstacles that hinder a proper “technology fix” to problems the industry is facing. There was also a large concern on how the market may react in the future if a negative image is allowed to develop, which could become worse with misinformation in social media. Another large concern was the potential market loss consequences if

other countries develop land-based salmon production systems close to the markets, allowing them to compete on lower carbon footprint and better prices. Taxes and other policy related decisions associated with restrictions were also named but were not necessarily seen as negative. In such cases the concerns were more on how effective they could be when compared between them. Potential tax rises could be negative if they do not create proper incentives, while positive if they are presented as mechanisms for reinvestment not only for the good of the industry itself, but society.

During the last *Reframing scenarios* session, the introduced reframed scenario was “imagining that the water conditions at the Norwegian coasts had become impossible for salmon farming, which forced the industry to move towards new geographical areas and solutions. Production schemes and expertise had been absorbed by refugees and immigrants, as for example from Ukraine, and moved to their countries of origin”. The participants were asked to reflect on this scenario; how would the Norwegian industry react to this as it would imply a change in market logistics and industrial infrastructure as a whole. Responding on this, most of the discussion in the third session focused on the need to strengthen Norwegian leadership in knowhow, especially regarding technological development and service provisions. Nowadays, this is taken as given due to Norwegian leadership at a global level but could diminish if not strengthen through proper networks and formation of global institutions. Furthermore, it also implied that Norwegian companies would need to find a balance for becoming more international both internally and externally, but also maintaining their identity by forming well established global structures. This would resonate not only at an industrial level, but also politically and marketwise.

## Observations

Throughout the two first sessions, narratives, scenarios, and related imaging outcomes, exposing several and contrasting stakeholder positions and perspectives, developed, changed, and/or were abandoned. Nevertheless, an interesting observation when comparing the two sessions was that several thoughts and ideas around positive hope, prospects, and visions were repeated. In fact, most of the participants very often defined the prosperity scenarios as realistic. This was not the case in the discussions of challenges facing the industry. How to manage and adapt to climate change, the emergence of new diseases and potential problems with supply of resources and human capital, are seen as potential large problems with no clear solution on hand. Sustainability issues and growth issues seemed to be challenges that hardly could be captured in a shared *Realistic scenario*. Nevertheless, most participants did see current investments as appropriate and done in a direction that will cope with the standards that are needed in the future. In one of the groups, CRISPR was seen as a type of biotechnology that can have a positive impact on most of the current challenges if it is approved for the Norwegian context in the coming years.

## Feedback

Finally, as last comments for the day, the organizers of the Lab received valuable feedback. The location and venue for the LAB had been good - pleasant, comfortable, and easy to reach and find. However, there were several comments about the degree of effectiveness of the discussion about the *Reframing scenarios* session. For the conditions, some participants expressed that the described scenario was too extreme while other found it to be realistic, indicating that the reframing hit the middle. Although the introduced scenario allowed for discussing out of the box issues, a few participants suggested an “in vitro salmon” scenario or a future where salmon meat are produced artificially in a lab through a protein printer. This would have forced participants to rethink their priorities as a blue industry, which implies having to change absolutely all type of procedures that are currently being done by companies,

service providers, and even technological developers. Furthermore, two participants, one from VIS and one from Fiskeridirektoratet, stressed their interest in applying this same type of method within their organizations as it allowed a constructive interaction for defining common vision and strategies among diverse actors.

### Key links

[“Future Literacy Lab”](#) ; [SALMANSVAR prosjektet](#); [KABIS prosjektet](#); [AFINO-nettverket](#)