

Resilience in the blue bioeconomy:

What can COVID-19 teach the Arctic about the impact of crises on value chains?



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Photo: Benjamin Hardman

Introduction

The COVID-19 pandemic may have been predicted by epidemiology experts, yet its arrival in 2020 was unforeseen by most. As it turned the world as we know it upside down, few regions globally remained untouched by its ramifications, which seemed to strike in many unexpected ways. In a globalised world, value chains have become increasingly complex, leading to equally complex disruptions in an event such as a global pandemic. Value chains were put to the test as disruptions in transportation and logistics, labour shortages, and sudden shifts in demand, happened all at once.

The Arctic was no exception and the *blue bioeconomy* – in this publication referring to fisheries and aquaculture – felt the disruptions to the value chains like most other food-based industries did. As the blue bioeconomy is foundational to the region's economy, supplying basic resources to meet fundamental needs while being integral to local culture, the disturbances to its value chains posed great, potential risks to the region and the health of its ecosystems.

However, while COVID-19 caused significant disruptions in the production and flows of goods and services, future value chain disruptions may become somewhat frequent due to a warming climate and its related implications. The origins of COVID-19 have been linked to land-use change and biodiversity loss, highlighting the risk of the emergence of other infectious diseases in the future as natural systems are under increasing stress. Value chains and global economies will not only be forced to adapt to uncertainties relating to climate change, biodiversity loss, and social crises, but must undergo a transformation in order to help prevent future harm.

Policy plays a central role in helping guide the transformation of value chains into systems that fulfil societal needs in a way that is sustainable and thereby prevents future social and ecological crises.

This publication summarises an initial investigation into what the impacts of COVID-19 can teach the Arctic region about the significance of crises for value chains in the blue bioeconomy. The aim is to provide policy makers with preliminary insights into how

value chains have been impacted by COVID-19 and to what degree they were resilient, as well as provide suggestions for how policy across the Arctic region can improve resiliency in the long-term in the face of future disturbances.

Publication background

This publication is based on an investigation and subsequent project initiated by the Nordic Council of Ministers into the impact of COVID-19 on value chains in FJLS-sectors. The project is managed by The Nordic Joint Committee for Agricultural and Food Research (NKJ) and Nordic Forest Research (SNS) and carried out by Nordic Sustainability between May and September 2021. The project resulted in the report, *Resilience in the blue bioeconomy, food and agriculture, and forestry sectors: What can COVID-19 teach the Nordic region about the impact of crises on value chains?*.

Throughout the project, a range of participants were involved in workshops, questionnaire, and talks representing a broad spectrum of the Nordic countries and associated bioeconomies. The participants relevant for the Arctic region and the blue bioeconomy will in this publication be referenced to as the 'participants'.

This publication takes key points from the report concerning the blue bioeconomy with a specific focus on the Arctic region and includes expert statements with insights on the way in which the COVID-19 pandemic has influenced value chains in the Arctic blue bioeconomy. The publication is funded by the Nordic Council of Ministers and carried out by Nordic Sustainability.

All literature sources can be viewed in the original report, *Resilience in the blue bioeconomy, food and agriculture, and forestry sectors: What can COVID-19 teach the Nordic region about the impact of crises on value chains?* on www.LINK.com

Expert interviews for this publication

Katrin Vilhelm Poulsen, Senior adviser on Fisheries and Aquaculture, Nordic Council of Ministers • **Nikoline Ziemer**, Business Development Manager at Royal Greenland • **Unn Laksá**, CEO, Blue Resource/Sjókovin • **Valur Norðri Gunnlaugsson**, Group Leader, Value Chain Division, Matís



Photo: David Trood

Executive summary

Blue bioeconomy value chain resilience in the face of COVID-19 in short

Disturbances to the value chains were experienced, yet most found they were resilient in the short-term

Value chain disturbances were related to market access being restricted, operations often not allowed at full capacity, as well as disturbances in transportation due to closed borders. Although significant disturbances were experienced, value chains were overall resilient in the short-term and most continued as normal or returned quickly to their previous state following the disturbances. Most participants stated in questionnaire that they experienced value chains being somewhat persistent and as such, resilient in the short-term. As evident in several interviews, companies were able to explore other markets, which underlines the fact that although the pandemic created global value chain disturbances, the solution for many was also found in the globalised market.

Although there are many examples of value chains that adapted to disturbances, companies were not able to adapt on equal terms

Significant changes seen in value chains include the adoption of digital technologies, changes in the types of products offered by firms, and production processes were adapted to operate under social distancing regulations and automated where possible.

These changes provide some examples of value chains that were able to adapt to disturbances, indicating resilience in the medium-term, but cannot be generalised across all blue bioeconomy value chains. The workshop questionnaire showed that most participants thought value chains were somewhat or very adaptive, with a quarter of participants reporting they were not adaptive.

Suggestions for how policy could help improve resilience in the long-term include:

- **Creating a coordinated crisis planning approach** across Nordic countries to ensure access to resources, labour, and export markets during value chain disturbances. Planning approach should recognise global value chains as integral to long-term resilience in Nordic and Arctic region.
- **Incentivising sustainable fishing and aquaculture practices**, by promoting the development of fishing methods that do not harm the seabed and the marine environment, including avoiding bycatch.
- **Enable traceability of Nordic products**, creating a more premium product offering with assurance of origin and thereby enabling the funding of sustainable practices.
- **Harnessing digital and modern tools to support fisheries control and inspections**, such as electronic monitoring systems of fishing practices. These monitoring systems could support traceability and documentation of sustainability claims.
- **Encouraging innovation in utilising rest raw materials**, especially for human grade consumption, to reduce waste and move towards a more sustainable and resilient system.



Photo: Visit Greenland



Photo: Elia Locardi



Photo: Filip Gielda

Disturbances of value chains due to COVID-19

In the early stages of COVID-19, the disturbances to value chains in the blue bioeconomy were logical consequences of the lockdowns and physical restrictions applied in most regions. However, there may have been significant differences in the experienced effects of these disturbances between fishers and companies, depending on their specific contexts, and naturally the complexity of the value chains they work with and rely on. For example, where in some countries fishing was halted due to travel restrictions, Norway was able to continue largely as normal with the exception of small boats partaking in the seasonal fishing, as reported by the Norwegian Seafood Federation in the workshop.

"While the Nordic countries made it through the COVID-19 lockdown relatively unscathed economically and socio-economically, the pandemic has gravely impacted other areas, not least the global south, as the pandemic severely disrupted operations and supply chains."

Katrin Vilhelm Poulsen, Senior adviser on Fisheries and Aquaculture, Nordic Council of Ministers

This example highlights a consistent observation: the effects of COVID-19 related disturbances tend to vary greatly between small and large actors in the sector. Difference in national characteristics have also played a significant role in the varying effects of these disturbances. This mostly relates to transport logistics in whether the country is connected via land and road transport or is reliant on airfreight and naturally, how the complexity of the travel restrictions made import and exports more difficult for some nations than others. The main negative effect on large, pelagic fisheries was due to travel restrictions. The closure of the fresh fish markets (a consequence of the closure of the HORECA) caused an increase in demand for canned and frozen fish, the main products supplied by the pelagic fisheries. However, while the large, pelagic fisheries thrived, the closing of the fresh fish markets negatively impacted both demersal fisheries as well as some aquaculture production systems.

"As the pandemic caused the fresh fish market almost to disappear overnight and nearly total loss of the HORECA market, sellers had to adapt to a completely different market. Closed borders and significantly reduced number of passenger planes taking cargo slowed down transportation, required a change in approach from fresh fish to refresh (the retail sector buys frozen fish, thaws it, and then sells it in supermarkets). While refresh is not a new concept, the pandemic revived it with great success. As this approach offers much more flexibility in sourcing and customers are buying the products, the refresh trend has continued beyond COVID-19."

Valur Norðri Gunnlaugsson, Group Leader, Value Chain Division, Matís

The most frequently experienced disturbances to the value chains:

- **Market access was restricted by overnight closure of the food service and hotel industries (HORECA).** The sudden change in demand led to sharp falls in price, forcing suppliers to sell fresh cuts at much lower prices. Global cancellations of events resulted in a near collapse of particularly high-end products such as lobsters and oysters. Supermarkets and takeaway became the main points for food at the height of COVID-19. Supermarkets' suppliers, such as aquaculture producers, were able to maintain both production and sales during the

pandemic as these were already accustomed to meeting their specific requirements for processed and pre-packed food. Consequently, large export firms had to seek out new markets dealing with volatile environments during the pandemic. As such, COVID-19 resulted in a necessity to diversify markets for many businesses and underlined issues around dependency on a single market segment, especially for the small-scale producers. However, diversifying markets in times of crisis is more difficult for the small-scale segment for whom financial resilience tend to be lower.

"The interim report from 2021 show that Royal Greenland was able to adapt and change in order to financially persevere. In addition to the COVID-19 pandemic, Brexit also caused disturbances to the value chains which the company had to take into account. By exploring new markets to sell to, Royal Greenland comes out of COVID-19 with a great financial result as well as having kept all employees on board throughout the pandemic. In addition to these measurements done Royal Greenland also continued exploring new possibilities to explore in Greenlandic sea, for example sea cucumber and sea weed cultivation through business development management."

Nikoline Ziemer, Business Development Manager at Royal Greenland

- **Operations were not allowed at full capacity due to restrictions of physical distancing between workers,** and hygienic requirements to limit contamination of the virus between people in production and processing facilities. For example, in onshore fish processing facilities and fishing vessels, workers operate in confined spaces making it challenging, if not impossible, to implement social distancing while maintaining the entire crew. A participant from the Faroe Islands expressed that workers in rural areas were more highly impacted by layoffs due to pandemic restrictions since other employment opportunities are more limited. Another factor could be companies shifting to rely less on human labour, as noted by Valur Norðri Gunnlaugsson, Group Leader, Value Chain Division, Mátis: *"Some companies have taken the time during COVID-19 as an opportunity to close their factories to update and install new equipment etc. Some with the focus to become more*

automatic as they were struggling with processing as they could not access labour and they now have more flexibility in the product mix."

- **Transportation, including air and road freight services, were disturbed by border closures.** Global air freight was temporarily halted and consequently became much more expensive as passenger flights were cancelled, in particular to large export markets, such as Japan or China. In countries where exceptions to travel weren't made for professional fishing, fishers, especially in rural areas, were financially impacted by the inability to access boats and the sea. For these in particular, fishing is a primary source of income and consequently, their financial resilience is low.

For many companies, COVID-19 was a wake-up call in relation to general business practice. Without access to air transport, countries were more depending on ships which take e.g. 3-4 days from Iceland to UK or France. However, ships offer good transport conditions for the fresh fishproducts which can stay consistently close to zero degrees, whereas cargo planes have more fluctuations in temperature. There is no doubt that many will be continuing with some of the practices they began during the pandemic, even after all returns to normal."

Valur Norðri Gunnlaugsson, Group Leader, Value Chain Division, Matís



Photo: Aningaaq R. Carlsen



Photo: Filip Gielda



Photo: Dan B. Kristensen

Disruption and value chain resilience in the short-term

Stages of value chain resilience

Short-term resilience is discussed in context of the **persistence** of value chains in the face of disturbances, to continue as if undisturbed or to go back to their previous state. Short-term resilience is explored in this brochure in the context of the degree to which value chains were persistent in the face of **disturbances** experienced because of COVID-19.

Medium-term resilience is discussed in context of value chains **adapting** to disturbance by reorganisation and integration of new ways of working, such as adopting new technologies. Medium-term resilience is explored in this brochure in the context of what **significant changes** were experienced in value chains because of COVID-19.

Long-term resilience is discussed in the context of the systemic **transformation** of value chains towards an organisation that is considerate of social and environmental sustainability and planetary boundaries. This definition was used to frame the development of suggestions for how **greater value chain resilience could be supported with policy** and **collaboration across Nordic countries**.

The recent nature of the COVID-19 pandemic means that securing data on relatively specific topics is challenging. However, through sources including the European Climate, Infrastructure and Environment Executive Agency, FAO, and OECD, it seems feasible to conclude that value chains were generally found to be robust to disturbances related to COVID-19 but with varying impacts between segments, national restrictions and support, and financial and operational capacity of actors.

"It's vital to keep in mind that the blue bioeconomy sector is used to external shocks: price shocks as well as variation in resource abundance. For several companies, COVID-19 was overall less impactful than the financial crisis of 2007-2008. So, although the pandemic was globally unprecedented, this is generally a sector that is used to not knowing what the coming years will bring and plans accordingly as much as possible."

Unn Laksá CEO of Sjókovin - Blue Ressource, Faroe Islands

A perspective on value chain resilience

Fundamental to the social-ecological perspective, is that resilience is more than "bouncing back" after disturbance and maintaining stability in value chains, although the persistence of value chains in the face of disturbance would indicate resilience in the short-term. The social-ecological perspective adds that to achieve resilience in the medium and long-term, value chains must have the capacity to adapt to new ways of working with an end goal to transform towards a system that goes beyond purely economic considerations and operate with respect to social and ecological sustainability.

Participants reported value chains to have been disturbed but many saw blue bioeconomy value chains to be fairly resilient in the short-term, and able to persist in the face of disturbances or return back to normal. In a questionnaire, the majority of participants stated that value chains were somewhat persistent (10/12 participants) or very persistent (2/12 participants). However, the short-term resilience of value chains was reported to vary widely by location,

part of value chain, and sector. For example, a participant from Iceland stated that wild fisheries were more able to persist while aquaculture needed more time to adapt; likely due to the varying degree of complexities between the respective value chains of wild fisheries and aquaculture. A participant from Greenland stated that fisheries continued, despite knowing there would be a drop in price.



Photo: Camilla Hey



Photo: Jörg Ehrlich



Photo: Visit Greenland

The significant changes as a result of COVID-19

Due to the disturbances of COVID-19, blue bioeconomy value chains had to adapt to operate under new conditions. The three most significant and frequently referenced changes include:

1. **Adoption of digital technologies as a response to pandemic freedom of movement restrictions.** This resulted in new opportunities and both literature sources and participants reported increasing online sales and providing new avenues to sell to customers. For example, project participants representing Nordic firms exporting to Asian markets remarked on opportunities to benefit from increased e-trade in Asia, an opportunity arising because of COVID-19. Some initiatives have increased resilience through enabling diversified revenue streams for fishers, such as establishing a fresh fish vending machine and direct marketing channels from the coast to cities. Other initiatives include direct sales to consumers, increased use of online platforms, and investment in diversification in general. Fishers, particularly through associations, have tried to decrease their dependency on established value chains, for example by making use of new marketing channels, directing sales from coast to city.
2. **Product mix, or the types of products offered by firms, changed during the pandemic.** For example, literature and participants reported an increase in frozen foods as compared to fresh cuts. By freezing fish, it prolonged its shelf-life and helped it reach export markets despite disturbances to transport and logistics.

In addition, smaller and more convenient packaging has been developed in order to adapt to the systematic shift in demand from the HORECA segment to retail sale and direct sales from businesses to consumers via the internet. The shift towards retail has led to signs of improved cooperation in the value chain as observed by the Norwegian Seafood Federation. While it is too early to make any certain conclusions, these trends could continue beyond the pandemic.

3. **Production processes were adapted to COVID-19 preventative measures and automated where possible.** Both in the literature and roundtables, it was emphasised that producers had to integrate preventative measures to prevent virus transmission, which created a challenge to maintain typical work processes and profitability. For example, in fish processing facilities or fishing vessels, social distancing was reported to be difficult or impossible while maintaining normal operations. Some producers were able to adapt with technological measures, as Oddur Már Gunnarsson, CEO of Mátis in Iceland stated in the roundtables, "Automation in processing has increased as suppliers want to be less dependent on human recourses."

"The populations of the Arctic region are highly dependent on an uncertain natural environment, which creates a culture of adaptation. This was evident in the response to the Covid-19 situation in the Faroe Islands. Authorities quickly established an effective covid-19 testing regime, initially adapted from technology used in the large salmon industry. Likewise, companies made changes to production processes, which allowed for the production to continue as usual."

Unn Laksá CEO of Sjókovin – Blue Ressource, Faroe Islands

Significant changes show value chain adaptation in the medium-term

Not all producers had equal capacity to adapt, especially producers reliant on the HORECA sector were reported to not be resilient. The capacity of individual fishers or producers, for example by having existing storage capacity, was key to be able to adapt and supply to new local demand. In an interview with Árni Mathiesen, Senior Advisor at Icelandic Ocean Cluster and former Assistant Director of

General Fisheries and Aquaculture Department at FAO and Icelandic Minister for Fisheries, he hypothesised that due to a lack of data, the true financial impact and adaptive capacity of value chains will only begin to be understood when the yearly reports are published by companies. A participant from Royal Greenland expressed that the company continued normal supply chain operations despite knowing that the market would fall for certain species.

The participants had a mixed view of whether blue bioeconomy value chains are adaptable. Half of participants that replied to the questionnaire stated that they experience blue bioeconomy value chains to be somewhat adaptive (6/12), and a quarter of respondents stating they are very adaptive (3/12) or not adaptive (3/12). Some participants stressed the need for government support to help aid adaptation.

"The focus for Royal Greenland was on staying strong enough to re-establish growth and earnings on the other side of the pandemic. Early in the year it was already clear that COVID-19 would have an extremely negative impact on earnings, Nonetheless, Royal Greenland decided to maintain the activity at approximately the same level as planned. This was based on the fact that, Royal Greenland operates in areas where the company's activities dominate employment and economic activity... a drastic reduction of fisheries and production would have entailed significant socioeconomic problems for local communities."

Nikoline Ziemer, Business Development Manager at Royal Greenland



Photo: Visit Greenland



Photo: Aningaaq R. Carlsen



Photo: Filip Gielda

How policy can improve value chain resilience

Despite disturbances, many value chains in the blue bioeconomy were generally able to persist and, in many cases, also adapt. However, signs of transformation towards greater acknowledgement of social and ecological boundaries which could make value chains more resilient in the long-term, were generally not acknowledged in the literature or by participants. Many participants expressed that it would likely be too early to see if COVID-19 has had this effect, but others suggested that the primary focus had been to get value chains "back to normal" rather than create systemic change.

"It seems as if the focus overall has been more on returning to the 'normal' pre-COVID stage, rather than trying to fundamentally transforming value chains to becoming more sustainable and resilient in the long-term."

Unn Laksá CEO of Sjókovin – Blue Ressource, Faroe Islands

Suggestions to improve resilience of blue bioeconomy value chains include creating more transparency in policy responses, enable learning from crisis and innovation to achieve greater sustainability, and improving the protection of natural resources.

Suggestions for how policy can improve value chain resilience include:

- **Enabling innovation to reduce waste and utilising rest raw materials.** Blue bioeconomy value chains already have examples of use of rest raw materials, but participants stressed that there is a need for improvement and innovation. Utilising seafood resources that are currently wasted as well as utilising these resources as human grade as much as possible, could be important first steps.
- **Ensuring corporate social responsibility in rural communities.** Participants emphasised the need for large corporations to be accountable towards their workers and the communities they operate in, especially in times of crisis. This vulnerability came to light in the pandemic, as it was reported that fishers experienced long waits and administrative procedures before receiving government support.

"For Royal Greenland, employees came first when the pandemic hit and downsizing internally was never on the table. Despite decrease in prices, we also kept buying from our fishers, to make sure their livelihoods were safeguarded."

Nikoline Ziemer, Business Development Manager at Royal Greenland

- **Creating a more coordinated planning approach across Nordic countries that is still sensitive to local context.** Participants called for better coordination in crisis planning to secure access to resources, labour, and export markets for short-term resilience. For greater resilience in the long-term, it was suggested to improve coordination of natural resource management. It is imperative to note that the blue bioeconomy works mostly with global value chains and while the Nordic countries can increase resilience in collaborating in several regards, they also heavily rely on global value chains and should work towards ensuring both diversity and flexibility in these, for long-term resilience. Policymakers should also be sensitive to local context, as difference in policy approach for small-scale aquaculture in comparison to fisheries is necessary.

- **Encouraging consumption of sustainably sourced local and seasonal fish.** Participants expressed a need for greater connections between fishers and consumers, leveraging this as an opportunity for consumer education. This could allow for local markets to sell not commonly eaten species, broadening the scope of sellable products. These measures could support the sustainability of local fisheries and the financial resilience of local and rural fishers for whom fishing is often the primary income source.
- **Prioritising sustainable fishing and aquaculture practices.** Literature suggest that the blue bioeconomy can build long-term resilience by incentivising low-impact fisheries that reduce harmful practices such as bottom trawling and bycatch, improve co-management of marine areas, incentivise more sustainable forms of aquaculture, and ensuring the restoration and protection of ecosystems. Participants agreed that policy plays a key role in supporting these efforts, prioritising ecological and social sustainability to build resilience in the long-term.
- **Improving product traceability.** Digital traceability was suggested by many participants as an opportunity to benefit the competitiveness of Nordic products by providing customers with an assurance of product origin and sustainability. Traceability could support a premium price, and thereby the cost of developing fisheries that are resilient and sustainable in the long-term. In addition, this could be supported by sharing standards on product labelling in the Nordic and Arctic region.

"Mandated traceability systems can go a long way in tackling sustainability and food quality issues and ensure that objectives are being met. It allows for better control on for example degraded stocks and the exploitation of workers. It could add value and create a competitive edge for Nordic products by making it possible to have more robust claims about the product and its origin."

Katrin Vilhelm Poulsen, Senior adviser on Fisheries and Aquaculture, Nordic Council of Ministers

Case: Hiddenfjord no longer uses air freight

The Faroese salmon farming company Hiddenfjord, run by brothers Atli and Regin Gregersen, is founded with sustainability as its main value. GLOBALG.A.P certified, Hiddenfjord specialises in producing antibiotic and hormone free salmon, which is harvested using stress-free methods and is packaged within three hours of swimming in the Atlantic Ocean. It has now been almost a year since Hiddenfjord stopped using air freight and they have reduced carbon emissions from overseas transportation by 94%.

Source: hiddenfjord.com/low-emission-shipment/



Photo: Aningaaq R. Carlsen



Photo: Aningaaq R. Carlsen

About this publication

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The Nordic Council of Ministers

Nordens Hus

Ved Stranden 18

DK-1061 Copenhagen

www.norden.org

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