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THE STATE OF ARCTIC FOOD

Report on the importance of Arctic food systems for local communities and global needs

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EXECUTIVE SUMMARY

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INTRODUCTION

This report carries out an in-depth analysis of the significance and contribution of the food sector to each Arctic economies, as well as provide evidence of its potential for meeting the global needs. By doing so, it seeks to help dispel the widespread misconceptions that “nothing can be sustainably grown or harvested in the Arctic” and that “the Arctic environment should be preserved at all costs”.

Hunting, fishing and harvesting have historically constituted the bulk of Northern communities’ nutritional requirement, and borne significant social and cultural meanings. These livelihood practices are still cornerstones of local economies and self-sufficiency today. In fact, country foods often make up for the limitations of the “modern” food system in supplying the region.

Tomorrow’s foods include seaweed and sustainably harvested fish, vertically-farmed vegetables and fruits grown using geothermal energy, and a large variety of high-quality plant and animal based protein sources. Tomorrow’s production processes are culturally-relevant, bolster local and Indigenous foodways, respect and safeguard the natural world, and encourage creativity. The Arctic offers all of that, today.

This report will demonstrate that sustainable economic development, ecosystem conservation, and local and Indigenous stewardship, are not antagonistic. Policymaking in and for the region should not ignore the agency and rights of the 4 million of us who live up North. Supporting the sustainable development of local food systems can serve as a vehicle for regional self-sufficiency, food security and environmental protection. The report further positions the Arctic as a key player in sustainably feeding the 9.7 billion humans expected to inhabit the planet by 2050.

The objective is to empower policymakers, government leaders, businesses, and other stakeholders, with a comprehensive understanding of the importance of the food sector for Arctic communities and global needs, as well as to provide both specific and cross-cutting realistic recommendations on how to prioritize efforts and where to allocate resources.

FOOD IN THE ARCTIC

While food systems across the circumpolar north experience different geophysical, socioeconomic and political conditions, food security can be considered as a common regional concern. Northern communities are faced with high levels of food insecurity due to challenging environmental conditions and historical socio-spatial disparities as compared to their southern fellow citizens. Guggenheim Partners have also estimated that $1 trillion worth of infrastructure is needed in the Arctic, including logistic hubs and processing and storage facilities. On top of that, environmental changes are imposing additional constraints on commercial and wild food systems. All of this undermines the availability, access, utilization and stability pillars of regional food security.

The food sector has long played a central role in Arctic economies and is expected to contribute significantly to feeding the world's growing population. The Arctic Council's Sustainable Development Working Group found that more than 5.6 billion kilograms of commercial foods were exported from the Arctic in 2016, having generated an estimated value of $24.8 billion. No less than 633 marine fish species could be harvested in the Arctic Ocean and adjacent seas, but only 58 are actually fished. Besides the workforce in harvesting and processing, the food sector is creating jobs in all areas of the economy, from research and innovation to the service industry. Local ingredients and savoir-faire have witnessed a "revitalization" thanks to Arctic food producers and chefs, some of them even gaining recognition from renowned institutions such as the Michelin Guide.

Yet, the potential of the Arctic food sector for local *and* global needs has barely been tapped. Full-utilization and waste revalorization represent key areas where improvements should be made. Food innovation is also critical in scaling-up sustainable agriculture and horticulture, using agroecological principles to develop climate-smart farming. At the very same time, investments in infrastructures are still *sine-qua-non* for realistically boosting Arctic food systems. It is finally necessary to listen and respect local and Indigenous communities when developing and implementing policy and programs, as well as to continuously support traditional food culture and knowledge.

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CHALLENGES

BUREAUCRATIC AND TECHNICAL ISSUES

- **Regulatory and administrative hurdles:** too strict food legislations, uneven regulations and food safety standards among Arctic and non-Arctic states, unfair competition from imported goods, and too-high export tariffs
- **Unreliable transportation and communication networks:** safety risks associated with Arctic climate conditions, lack of trade and logistic centers, and incomplete and/or unreliable broadland and satellite coverage
- **Logistical barriers:** inadequate processing and storage facilities, as well as logistical hubs, in many Arctic settlements

ENVIRONMENTAL AND ECONOMIC OPTIMIZATION

- **Economic specialization:** over-reliance on blue resources, underdeveloped agriculture and horticulture, and dependence on food imports
- **Food loss and food waste:** by-products, discarded products, incomplete utilization and waste representing an unwarranted economic shortfall for all actors along food supply chains
- **Lack of an up-to-date food database**: lack of comparable pan-Arctic data and missing or unreliable national data related to the food sector hindering a comprehensive allocation of public aids and detering private investments

SOCIO-ECONOMIC AND POLITICAL FACTORS

- **Downward spiral characterizing the demographic landscape**: brain drain and youth emigration caused by a lack of meaningful opportunities
- **Limited pan-Arctic cooperation on food security**: patchy coordination within and among the different sectors and actors making up Arctic economies

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STRENGTHS & OPPORTUNITIES

As a response to common assumptions, this report argues that Northern economies may well have drawn a winning hand for sustainable food production. Here are the top 3 trump cards of Arctic food systems:

1) Strong local and Indigenous traditions and foodways in sustainable food harvesting and production
2) Rich and relatively-clean ecosystems characterized by high-quality inputs, like clean water, and important reserves of renewable energy sources
3) A capable workforce, educational institutions and research centers, that nurture an innovative approach and an expertise in nature-based solutions

Sustainable development opportunities still need to be pursued for Arctic food system to actually benefit the food security and wellbeing of local communities and ecosystems, as well as, to a larger extent, of the world's population. Here are the top 3 wild cards that are to be used:

1) A systematic aspiration for full-utilization, waste management and resource efficiency oriented towards establishing a circular economy in the food sector
2) Diversification of food-related activities along the value chain, including developing food tourism and scaling-up agroecological production and climate-smart agriculture
3) Regulations that promote local food sourcing and public-private partnerships supporting sufficient infrastructure capacities for locally-based processing, storage and distribution

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RECOMMENDATIONS

1. Building a tax and legal framework supporting the scaling-up of the Arctic food sector:

- National and local governments should provide economic incentives tailored to stimulate the domestic food market in the Arctic and ensure access to a culturally appropriate food environment;
- Digital technologies are to play a key role in scaling up and scaling out Arctic food industries, which includes the creation of electronic trading platforms to simplify the steps to connect producers and buyers;
- AEC is calling governments and food industry representatives to jointly develop a “protected geographical indication” (PGI) to include the Arctic, so as to improve traceability and incentive good practices.

2. Bridging the connectivity gap to reduce the physical and cost-related barriers to food trade:

- Public-private partnership should be promoted to overcome the economic barriers associated with setting up congruent transportation networks as well as to increase logistic capabilities and infrastructure capacities;
- Green shipping is arguably the most sustainable and cost-effective way to facilitate regional food imports and exports, but it requires mitigating climate-related navigation risks and promoting renewable energy sources;;
- Public-private partnerships should also be created and/or reinforced to promote the rapid deployment of a variety of broadband technologies and hence expand access to internet/cell coverage.

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RECOMMENDATIONS

3. Diversifying products, production methods and food-related economic activities:

- Government and financial institutions should develop action plans tailored to support the diversification of food economies, including expanding the scope of projects eligible for state permitting and grant funding;
- The creation of “moonshot” mission projects combining food innovation and traditional knowledge is necessary to sustainably increase food production while improving energy and water efficiency and reducing food waste;
- Food tourism has the potential to boost local businesses along the food value chain, help safeguarding the local biocultural heritage and support the revitalization of Indigenous foodways.

4. Fostering proactive and inclusive partnerships among food systems’ actors and sectors:

- Governments, educational institutions and research centers should strive to make the food sector a desirable and meaningful career pathway, and to inspire young professionals to start food-related occupations;
- Small and medium-sized enterprises can benefit from working together to capitalize on economies of scale in production, distribution, marketing, and sales, *inter alia* through cluster-type organizations;
- Quality, timely and reliable data, including annual national reports and the creation of an online Food Database, are essential for improving both the national policy-making process and the scope of regional cooperation.

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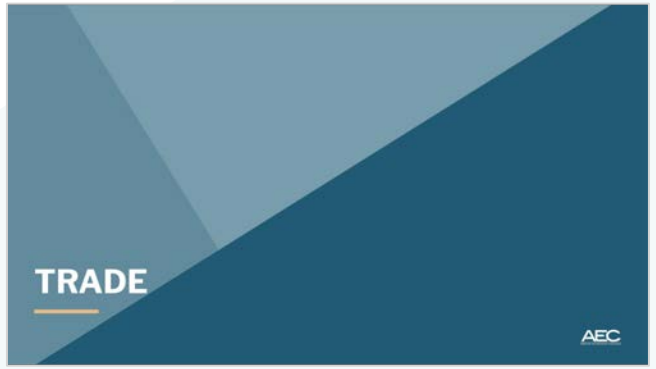
STRUCTURE OF CHAPTERS



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ALASKA

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ALASKAN FOOD

The largest private industry employer in Alaska is the seafood industry and it is the second largest sector of the state economy.

Sustainability is a literal part of the state constitution. There are strict quotas on just about everything that can be taken from the land to prevent overharvesting of any of Alaska's replenishable resources. By state law, all meat from a hunted animal must be made into food; even roadkill is salvaged as sustenance.

In the warm, sunny summers, the fields and mountains are blanketed wild berries while the icy seas are abundant with salmon; local communities pick these berries and fishermen harvest these migrations of fish, knowing that what is gathered now must be enough to sustain oneself through the frigid winters.

A sort of traditional ice cream called akutaq, a dish that is made with snow and whipped seal oil or wild game lard, could be mixed with berries and even fish; nowadays, the dish is often made with shortening and sweetened with sugar.

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One study found that lingonberries grown in Alaska had over eight times the presence of antioxidants compared with conventionally-grown berries from the outside of the state; another source cited statistics that wild Alaskan blueberries are up to 10 times more concentrated in antioxidant content than the common blueberry.

Wild Alaskan Company

OVERVIEW

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KEY FIGURES

ECONOMY

GDP: **$49.6 Billion** (2022)

Unemployment rate: **5.1%** (2022)

PEOPLE

731,869 inhabitants (2022) <1% total U.S.A.

15,7% Indigenous Peoples
Aleut, Alutiiq, Athabascan, Eyak, Tlingit, Haida, Tsimshian, Inupiaq, Yup'ik, Cup'ik

ENVIRONMENT

6,640 miles/ 10,686 km of **coastline**

A distance greater than that of all the other U.S states' coastlines combined

ENERGY

Fourth-highest per capita **total energy consumption** in the U.S.A.

31% of electricity production from **renewables** (2020)
Natural gas (42%) /Hydro (28%) /Petroleum (16%)

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KEY SECTORS

Energy

85% of the state budget is supplied by oil revenues

Mining

In 2021, more than 10.000 direct and indirect jobs came from mining

Government

State with the second-highest rate of military personnel and highest percentage of residents who are military veterans

Tourism

The tourism industry is the second-largest private-sector employer

Commercial fishing

Nearly 6 billion pounds of seafood are harvested annually

Forestry

There are 28 million acres of commercial forest in Alaska

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THE FOOD SECTOR

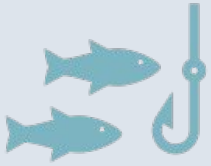
Alaska's Food Sector in Short

$8.82 billion /15% of Alaska's GDP (2020)

About 27 300 workers and 55 000 direct and indirect jobs

Agriculture, forestry, fishing and hunting is the sector with the more growth in percent terms (2021)

FOOD ECONOMY



Blue Economy

$5.4 billion Seafood Industry (2020) – But only a tiny fraction remains in the state

60% of commercial seafood harvested in the U.S.A.

Over **56,000 direct jobs** and about **10,000 indirect jobs**

Seafood processing is the largest manufacturing sector, accounting for **70% of Alaska's manufacturing employment**

Green Economy

$38.6 million agricultural production and processing industries (2020)

About **15 million acres of soil suitable for farming**, with **1 million acres currently in production,** concentrated in the Matanuska-Susitna valley

Mainly nursery products, hay, potatoes, cattle and dairy products

Service Economy

23,410 workers in food preparation and service-related occupations

3240 workers in food production

Food services account for **6.9% of state employment**, being the **second sector with most growth** in terms of number of **jobs** (2021)

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3 FOOD-RELATED FACTS

Finfish farming is prohibited in Alaska state waters within 3 miles offshore. Aquaculture is based on aquatic plants and shellfish.

Alaska is the N°1 producer of wild salmon in the world. However, pollock represents the majority of the volume harvested.

Local farmers have produced a world-record 19-pound carrot, 76-pound rutabaga and 127-pound cabbage.

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THREE FOOD COMPANIES FROM ALASKA

Silver Bay SEAFOODS

Processor of frozen, salmon, herring and squid products for domestic and export markets

COPPER RIVER SEAFOODS · WILD SEAFOOD from ALASKA ®

Alaska-based wild seafood company created by local fishermen

ALASKA COMMERCIAL CO.
Serving Alaskans Since 1867

Retail company providing groceries and general merchandise throughout Alaska

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More than 1400 restaurants are registered in Alaska but none of them is mentioned in the Michelin guide yet.

However, the famous chef Thomas Keller has opened a restaurant onboard a cruise ship that goes to Alaska.

Chef Thomas Keller (source: foodandsense.com)

TRADE

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TRADE AGREEMENTS

The United States currently has **14 Free Trade Agreement**s (FTAs) with **20 countries** in force, most involving agricultural and food products. **38% of Alaska's exports ($1.8 billion) go to current FTA partners**: Australia, Bahrain, Canada, Chile, Colombia, Costa Rica, the Dominican Republic, El Salvador, Guatemala, Honduras, Israel, Jordan, South Korea, Mexico, Morocco, Nicaragua, Oman, Panama, Peru, Singapore.

Mexico and **Canada** are respectively N°1 and N°2 recipients of U.S. food exports, through the U.S. – Mexico – Canada Agreement (USMCA that entered into force on July 1, 2020.

Despite the U.S. being the European Union's largest trade and investment partner, there have no dedicated free trade agreement as of yet. Similarly, there is no free trade agreement between the U.S. and the United Kingdom.

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TRADE BALANCE - ALASKA

FOOD EXPORT

$2.40 billion (2020)

Seafood is Alaska's top export, making up over half of the state's total exports.

Leading products: pollack, salmon, crab and cod, together accounting for about 40% of total blue exports

Alaska is the country's 50th largest agricultural exporting state.

Leading products: miscellaneous crops (mainly potatoes), floriculture and hay.

Most export to: China, Japan, South Korea, and Canada

FOOD IMPORT

app. $2 billion

About 90-95% of food purchased in stores comes from outside Alaska.

1. Processed food
2. Meat and Seafood products
3. Agricultural products

Most import from: Lower 48, Canada, Mexico, China, Japan and South Korea

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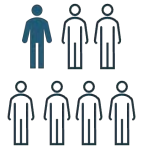
Even 1% recapture of [the $2 billion spent annually on food import] would ensure $10 million more dollars would circulate around the state and support local producers.

Alaska Food Security and Independence Task Force 2022

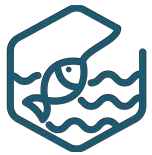
LOCAL FOOD

FOOD SECURITY & SELF-SUFFICIENCY



1 in 7 Alaskan is food insecure, and there is a **3- to 5-day supply** of most foods in grocery stores.

The cost of food varies greatly the farther away from major cities. Subsistence hunting and fishing account for **80% of the annual diet** for some **rural villages**, while representing around **10% for urban dwellers.**



Wild foods provide **175% of daily protein requirements** and **25% of caloric requirements** in **rural Alaska**.

Each year, 961,000 people hunt, fish, or enjoy wildlife-watching in Alaska, contributing over $1.3 billion in wildlife recreation spending to the state economy.

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LOCAL AND INDIGENOUS ECONOMIES

Local and Indigenous hunters, fishers, and gatherers harvest an estimated **34 million pounds of wild foods annually**.

- *Coast*: **salmon**, **marine mammals** (Northern coast), **shellfish** (Southeast coast).
- *Interior:* **caribou**, **moose**, and **dall sheep**

It's illegal to sell big-game meat in Alaska, and animals like **seal or whale can be harvested only by Alaska Native people**.

Alaskan foods include: kelp, salmon, halibut, herring eggs, gull eggs, wild mushrooms, venison, and moose.

Source: Inuit Circumpolar Council-Alaska, Alaskan Inuit Food Security Conceptual Framework: How to Assess the Arctic From An Inuit Perspective, 2016

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RESEARCH & POLICY

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RESEARCH AND POLICY

Food Hubs/Clusters

AFDF Startup Accelerator
Food Bank of Alaska
Alaska Food Hub
Arctic Harvest Deliveries
Alaska Mariculture Cluster
Alaska Blue Economy Center
Catch 49
Kodiak Harvest
Qik'rtaq Food Hub
Salt & Soil Marketplace
The Alaska Food Policy Council
The Interior Alaska Food Network

Science and Education

University of Alaska Fairbanks:

- School of Fisheries and Ocean Sciences
- School of Natural Resources and Agricultural Sciences

University of Alaska Anchorage

NOAA Fisheries Alaska Regional Office and Alaska Fisheries Science Center

Dietary Guidelines

U.S. Department of Agriculture and U.S. Department of Health and Human Services. Dietary Guidelines for Americans, 2020-2025

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EXAMPLES OF SUPPORT AND INVESTMENT

In 2022**,** Senator Lisa Murkowski announced **$1.6 million** were allocated by the U.S. Department of Agriculture to the Alaska Division of Agriculture for the Micro-Grants for Food Security Program. USDA improved grants for Alaska were awarded to **366 individuals and non-profits** within Alaska, supporting **234 projects**, including greenhouse and storage facilities proposals.

On February 9, 2022, Alaska's Governor Mike Dunleavy established the **Alaska Food Security and Independence Task Force**. The latter was charged with drafting a report providing recommendations regarding **policy and guidelines for state initiatives on food security**.

In April 2022, Governor Dunleavy introduced House Bill 415 relating to the **Alaska Food Freedom Act**, introducing exemptions in food regulations to facilitate producer to sell homemade food products.

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EXAMPLES OF SUPPORT AND INVESTMENT

In September 2022, **House Bill 41** has expanded the scope of mariculture projects eligible for state permitting and grant funding expanding the scope of mariculture projects eligible for state permitting and grant funding, and the **Office of Food Security** was established to formalizing, centralize, and coordinate the state's efforts related to food security.

In October 2022, the Alaska Mariculture Cluster has been awarded **$49 million in grants to support the local Alaska mariculture industry**, as part of the American Rescue Plan Act. The Alaska Legislature also devoted **$5 million to the Alaska Mariculture Alliance** for a new mariculture matching grant program, and **$7M to University of Alaska** for aquaculture training and development. In addition, Alaska aquaculture scientists received funding from **the Exxon Valdez Oil Spill Trustee Counci**l, totaling $32 million over the next 10 years. A **$1.9 million federal grant will finally support University of Alaska Fairbanks** programs that focus on Indigenous food and energy system development and sustainability at the institution's five rural campuses.

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EXAMPLES OF SUPPORT AND INVESTMENT

In September 2022, the U.S. Department of Agriculture announced that **$25 million in project funding** will be distributed to over 30 local and regional partners for 70 locally driven initiatives, as part of the **2021 Southeast Alaska Sustainability Strategy**.

NOAA Fisheries in Alaska supports projects in the fishing sector through several **funding opportunities**. These include the *Pacific Coastal Salmon Recovery Fund*, *Alaska Marine Education and Training Mini-Grants Program*, *Alaska Native Co-Management of Marine Mammals*, *Alaska Fisheries Disaster Relief*, and *Alaska Aquaculture*.

In May 2023, U.S Department of Agriculture announced that it has approved the purchase of up to **$119.5 million worth of Alaskan food products** - Alaska sockeye salmon and Pacific groundfish. This will support Alaska's fishing industry and food security, but also will bring healthy Alaskan food products to families across the country through federal food assistance programs.

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Strategic Objective 2.1: Advance Community Adaptation and Climate Resilience

Communities (face) climate challenges, including adverse impacts on food security due to changes in the availability of and access to subsistence resources and increased vulnerability to drought and wildfires.

Strategic Objective 3.2: Improve Access to Services and Protect Subsistence Lifestyles and Cultural Traditions:

Indigenous Knowledge will inform decisions about Alaska's fish and wildlife resources and help navigate the threats posed to Alaska's subsistence lifestyles.

2022 U.S. National Strategy for the Arctic Region

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TAKEAWAYS

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STRENGTHS OF ALASKA'S FOOD SYSTEM

Focus on sustainability and innovation

Strong local and Indigenous food economies

Location with easy access to the north American and Asian markets

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KEY AREAS FOR DEVELOPMENT

Transitioning to low-carbon energy sources

The development of Alaska's abundant yet untapped renewable energy sources would strengthen local food systems, for production and along the supply chain. Hydrogen-based fuels also have the potential to replace fossil fuels in the transport sector, reducing the cost of import and export.

Scaling-up local and sustainable horticultural production

Innovative food production solutions using renewable energy sources, such as greenhouse farming, are necessary to increase self-sufficiency of fresh vegetables and fruit in remote North settlements, where food is not always accessible and/or available.

Supporting infrastructure development

Incentives should be created for private industry to increase investments in infrastructure such as transportation roads, cold storage and processing facilities.

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ICELAND

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ICELANDIC FOOD

The seafood industry is the largest private industry employer in Iceland and the second largest sector of the state economy behind tourism.

The land has a combination of hot springs, glaciers, and volcanoes in its natural diversity, which is equally diverse in its food choices. The surreal beauty of Iceland is visible in its food. The pillars of Icelandic cuisine are seafood, lamb and dairy products.

For a long time, Icelandic people didn't grow green vegetables or fruits, that were luxury items. Greenhouses have mushroomed in Iceland, promoting the production of native vegetation, which is why now common green vegetables and Icelandic herbs can be found on Icelandic tables.

Skyr is a protein-packed yogurt that has been part of the Icelandic heirloom culture for nearly 1,000 years. It takes nearly four cups of milk to make one cup of Skyr, making it thicker and creamier than yogurt. Hakarl, the national dish of Iceland is made up of fermented shark meat, which is kept for several months to acquire its ideal state.

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Iceland greenhouse vegetables contains a higher concentration of vitamin A, vitamin E and folate than in imported vegetables.

Matís

OVERVIEW

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KEY FIGURES

ECONOMY

GDP: **$25.75 billion** (2021)

Unemployment rate: **3.3%** (December 2022)

PEOPLE

387,758 inhabitants (2022)

No Indigenous people

ENVIRONMENT

4,970 km of **coastline**, including islands

Icelanders **live on just ⅛ of the land**

ENERGY

About 87% of the total energy supply derived from **renewable energy sources** (2021)
Geothermal energy provides 90% of Iceland's heating needs

100% of electricity generated from renewables (2021)
Hydropower (73%) and Geothermal (27%)

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KEY SECTORS

Tourism

Tourism is Iceland's largest export sector, accounting for about 10% of GDP and 15% of the workforce (2022)

Seafood Industry

In 2018, Iceland produced 1.3 million tonnes of seafood. In 2020, Iceland was the fourth largest producer of farmed Salmon.

Aluminum smelting

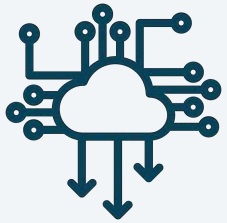
Aluminium accounts for 40% of total exports. Icelandic smelters are run on renewable energy

Energy

Hydropower is the main source of industrial and home electrical supply in the country

Government

24% of the workforce is employed in the general government (2020)



ICT & Tech

The data center industry has expanded rapidly over the past few years, now contributing close to 1% of Iceland's GDP

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THE FOOD SECTOR

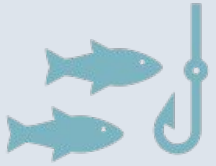
Iceland's Food Sector in Short

The gross value added of agriculture, forestry, and fishing, was reported at $1.08 billion in 2022, 4.5% of the national GDP. Fishing and aquaculture made up 82% of this value.

The manufacture of food products, beverages and tobacco products was worth $1.07 billion in 2022.

In recent years tourism has contributed to the development of high-end restaurants.

FOOD ECONOMY



Blue Economy

$892 million Fishing and aquaculture Industry, without taking processing into account (2022) - About 90% from fisheries and 10% from aquaculture

The gross value of Icelandic fish catch in was **$1,39** in 2022. **Cod** represents about **⅔** of the **total catch** (150,000 tons/year). **Atlantic salmon** accounts for **90%** of all **fish farming**

The Fishing industry directly employs around **8,000 people** /**4% of the workforce**

Green Economy

$188 million gross value added for **crop and animal production, hunting and related service activities** - **4% of the workforce**(2021)

Total meat production of 30,428 tons, **skyr production of 4,500 tons**, **hay yield of two million cubic-meters**(2022)

⅛ of the land is arable, with **6% currently cultivated** and **66% of agricultural lands are in the south**

Mainly sheep/lamb, dairy products, cereals, potatoes and carrots, and greenhouse farming

Service Economy

$796 million Accommodation and Food Service Industries (2022) –about 3% of GDP

5% of the total work force works accomodation and food service activities

There is no McDonald's in Iceland!

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3 FOOD-RELATED FACTS

There are about 800.000 sheep in Iceland., which equate to more than two sheep per one Icelander. 3,000 small family-owned sheep farms are spread across Iceland.

Iceland's fishery industry has reached 80% usage of white fish and 90% of the cod catch. This utilization of rate of the fish biomass is substantially higher than the other European countries and the U.S.

Thanks to its abundance of geothermal energy, Iceland is a cornucopia of greenhouse crops, including tomatoes, cucumbers, coffee, cocoa. The country even claims to have Europe's largest banana plantation in Hveragerði, Iceland's greenhouse capital.

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THREE FOOD COMPANIES FROM ICELAND

BRIM

Fishing and processing of groundfish and pelagic fish employing about 800 full-time employees at sea and ashore

marel

Began as an innovator in onboard weighing technology for the Icelandic fish industry, and now employs 8,000 employees with offices in 30+ countries

SAMHERJI
ICE FRESH SEAFOOD

A vertically integrated seafood company, operating a fleet of fishing vessels, fish factories and fish farming

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There are more than 350 restaurants in the greater Reykjavík area alone. 5 places are recommended in the Michelin Guide: Moss, DILL, ÓX, Sümac, and Matur og Drykkur.

Two of them, DILL and ÓX, are one-starred Michelin restaurants.

Óx Chef Rúnar Pierre Heriveaux (source: Arctic Circle)

TRADE

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TRADE AGREEMENTS

Iceland's membership in the **European Economic Area** means that the country adopts most of the **European Union's product and import standards and regulations**, such as food product labeling and a requirement for products to have the CE marking.

Bilateral trade negotiations in agriculture are conducted between Iceland and the EU on the basis of Article 19 of the EEA Agreement and of the **Iceland-EU bilateral agreements on tariff preferences for fish and agricultural products**.

Iceland is a Member State of **the European Free Trade Association**, along with **Norway**, the **Liechtenstein** and **Switzerland**. As a consequence, Iceland is part the **30 FTAs** that the EFTA States have jointly negotiated with about 40 countries and territories outside the EU, including with **Canada.**

In addition, Iceland has bilateral free trade agreements with **the United Kingdom**, **China**, the **Faroe Islands**, and **Greenland**.

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TRADE BALANCE

FOOD EXPORT

$2.46 billions (2022)

Seafood is Iceland's top material export, accounting for 43% of the value of all exported goods.

Leading products: Cod is the most important export species (49% of total seafood industry exports).

In 2021, agricultural raw materials exports represented only 0.6 % of total exports.

Leading products: About 1,300 tons of skyrs are exported annually for a value of about $3.7 million.

Most export to: UK, Norway, United States, Denmark and Germany

FOOD IMPORT

$640 billion (2021)

Food and beverages encompass **about 10% of total merchandise import.**

1. Processed food
2. Seafood products
3. Meat products

The agricultural sector depends on the import of **feed sources**, and the fishing industry on **fuel import**.

Most import from: UK, Netherlands, Norway, Sweden, Denmark, and the US

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Personal import of meat and dairy products from non-EU/non-EEA countries to Iceland is prohibited.

Meat and dairy products can be imported from the Faroe Islands or Greenland, provided that their combined quantity does not exceed 10kg. Meat from the United States needs to be frozen for thirty days prior to entering the Iceland.

Skatturinn - Iceland Revenue and Customs

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LOCAL FOOD

FOOD SECURITY & SELF-SUFFICIENCY

53% self-sufficiency: domestic production sustains **90% of meat**, **96% of eggs**, **99% of dairy products,** but **only 43% of vegetables**.

Geothermal energy, **hydroponics** and **vertical farming** are promising solutions to increase domestic production.

In 2022, the Icelandic Fisheries Minister announced that **no permit will be renewed for commercial whaling after 2023**. This means Iceland could end whale hunting from 2024 onwards.

Berry picking is a tradition among many Icelandic families from the beginning of August to mid-September more or less.

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RESEARCH & POLICY

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RESEARCH AND POLICY

Food Hubs/Clusters

Iceland Ocean Cluster
Ocean Cluster House
Iceland Eco-Business Park
100%Fish
Orkídea
Grandi & Hlemmur Food Halls
Westfjords ArcticHubs

Science and Education

Matís
Rannís
Marine and Freshwater Research Institute
The Agricultural University of Iceland
The University of Iceland
Reykjavik University
The University of Akureyri
Icelandic College of Fisheries
NORA

Dietary Guidelines

Directorate of Health, Ministry of Welfare. Food-based dietary guidelines for adults and children from two years of age (2014)

Nordic Nutrition Recommendations (June 2023)

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EXAMPLES OF SUPPORT AND INVESTMENT

In March 2021, Iceland's Minister of Fisheries and Agriculture announced a financial support of **$7.5 million to Icelandic sheep and cattle farmers**, to offset some of the economic consequences of coronavirus-related social and travel restrictions.

In August 2022, Minister of Food, Agriculture and Fisheries Svandís Svavarsdóttir announced that **ISK 584.6 million** ($4.2 million /€4.1 million) will be allocated to the **Food Fund** (Matvælasjóður). **28 projects** will receive grants, including a project aiming at maximising the productivity of home food growing systems for **local vegetable production**, an initiative to establish a **monitoring and certification system** for Icelandic salt-fish products, as well as several projects to assess and harness the potential of **Icelandic algae farming**.

"The creativity and daring that Icelandic food manufacturers possess is a reason for rejoicing and goes to show that Iceland is on the right course as a food manufacturer. It's also great to see that the gender ratio is almost even" - Svandís Svavarsdóttir

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EXAMPLES OF SUPPORT AND INVESTMENT

In August 2022 still, Iceland's Samherji announced that a **€400 million investment in aquaculture** over the coming years. Funding of €313 million have *inter alia* been provided for the construction of a new land-based fish farming site near the Reykjanes Geothermal Power Plant with a production capacity of up to 40 thousand tons of salmon. In May, **€26.6 million** have already been announced to expand the fish farming facility in Öxarfjördur, Northeast Iceland. The next step is building a new hatchery in Grindavík, for an estimated cost of €6.6 million.

Iceland is associated to **Horizon Europe**, the EU's research and innovation fund. As such, Icelandic projects and researchers can receive funding from the EU's €95.5 billion programme. Iceland is also covered by the **Northern Periphery and Arctic Programme**, the EU funded scheme addressing challenges facing peripheral and remote communities in the Arctic and North Atlantic region.

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7) To safeguard health of the marine environment, including taking preventive action against the threats posed by ocean acidification and all kinds of ocean pollution.

10) To utilise possible economic opportunities in the Arctic region with an eye to sustainability and responsible use of resources.

11) To further trade and cooperation on commerce, education and services in the Arctic region

12) To work towards stronger monitoring and safer transport by sea and air, including by improved connectivity and a tighter network of satellite systems, e.g. for satellite navigation.

2021 Iceland's Policy on Matters concerning the Arctic Region

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TAKEAWAYS

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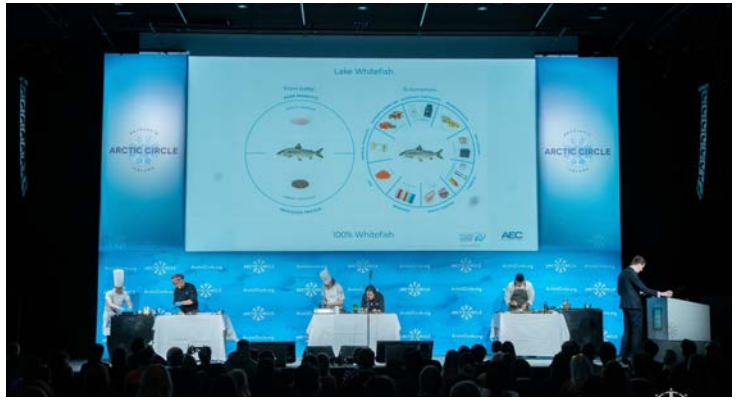
STRENGTHS OF ICELAND'S FOOD SYSTEM



Innovative and solution-oriented approach to food systems

Abundant and sustainable energy resources

An "intermediary" between Europe, North America, and the Asian countries

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KEY AREAS FOR DEVELOPMENT

Encouraging the consumption of local foods

Marketing and financial incentives should be improved to encourage Icelanders to consume more local foods on a daily basis, especially vegetables and fruits. Creating more local farmers' markets would for example help increase local food consumption.

Scaling-up food production from renewables

While local renewables are used extensively in horticulture and to meet citizens' daily needs, the agricultural sector and the fishing industry respectively depend on feed and fuel import. Solutions should be offered to increase the portfolio of Iceland's renewable energies utilization.

Diversifying the food economy

More support mechanisms should be devoted to scale-up Iceland's green economy as well as to fully leverage the potential of the service industry, including tourism and restaurants, to the national economy.

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GREENLAND

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GREENLANDIC FOOD

Fisheries is the largest industry in Greenland. However the public sector, including publicly owned enterprises and the municipalities, plays the dominant role in the economy.

Greenland is the world's largest island that is not a continent. Most inhabitants are concentrated on the southwest coast The 2009 Self-Government Act has transferred more responsibilities to the Greenlandic government, with the exceptions of foreign policy and defence that remain the supervision of Denmark. Greenland has also two representatives in the Danish Parliament, the *Folketing*.

In a country covered by extensive permafrost, the land wildlife is limited to those mammals and birds that can forage through deep snow, such as musk-ox, reindeer and ptarmigan. Only a tiny fraction of the land in South Greenland is suitable i to run sheep farming and to grow select fruits and vegetables. The sea provides most of Greenlandic food, including cod, salmon, whale and seal.

Suaasat is the national dish of Greenland. It is a thick broth often made from seal meat, potatoes, onion, rice, salt, pepper and local ingenuity. Other meats can also be used such as whale, reindeer or fowl.

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Seaweed contains is the most nutrient dense plant on the planet, with over 10 times more nutrient per kg than any land plant. Seaweed has more iron than spinach, more vitamin C than oranges and more calcium than milk.

Royal Greenland - that is currently doing a trial projet with seaweed.

OVERVIEW

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KEY FIGURES

ECONOMY

GDP: **$3.08 billion** (2020)

Unemployment rate: **3.7%** (2021)

PEOPLE

56,653 inhabitants (2021) - world's lowest population density

89% of the population is Greenlandic Inuit

The Kalaallisut language is divided into South Greenlandic, West Greenlandic, East Greenlandic and the Thule dialect

ENVIRONMENT

44,087 kms of **coastline**

Almost 80% of Greenland's landmass is covered by the ice sheet

ENERGY

71% energy production from **renewables** (2021)

Hydropower provides 60-70% of Greenland's entire electricity needs and represents 97% of total renewable sources

However, fossil fuels provide **82% of energy consumption**

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KEY SECTORS

Government

Public administration and service sector is the largest employer, clustering over 40% of all jobs

Seafood Industry

58,300 tons of shellfish and 58,700 tons of fish in 2021. However, most fish products are processed outside of Greenland

Mining

Currently there is one operating mine, one of anorthosite and one paused ruby mine. In November 2021, the parliament voted to ban uranium mining and exploration.

Tourism

39,293 international passengers have landed in Greenland's airports in 2021

Energy

5 hydropower plants are operating in Greenland and 2 additional are in construction. Greenland has banned all oil exploitation.

Block grant

Block grant of $569 million (2021) from Denmark accounts for about 20% of Greenland's GDP and more than half of the public budget.

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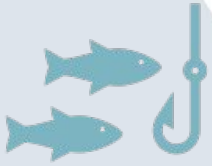
THE FOOD SECTOR

Greenland's Food Sector in Short

The fishing, hunting and agriculture industry is the second employment sector, with on average 4,211 employees per month - 15% of employment (2021)

About 1/3 of the revenue generated by the companies is created within the fisheries and fisheries-related industry and trade

FOOD ECONOMY



Blue Economy

$279 million Seafood Industry (2020) - About **1/3** of the total value added

About **7,500 workers** in **fisheries and fisheries-related industry and trade** (2021)

25% of total employment - **60% in fisheries** and **40% in fish processing**

Shrimp, prawns, Greenlandic halibut, and cod

Green Economy

$38.6 million Agricultural Industries (2020) - 4% GDP

About 280 workers in Agriculture, forestry and related industries (2021)

Only about **1% of Greenland is considered arable** in the southern ice-free regions - **38 farms**

Sheep (99% of farmed meat), lamb, potatoes and cabbage

Service Economy

$21 million Accomodation and Food Service Industry

About 1,700 workers in Accomodation and Food Service activities (2021)

462 workers in hotels and restaurants (2021)

Foreign nationals make up a significant share of the workforce in the service sector and now represent 2.7% of the total population.

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3 FOOD-RELATED FACTS

Each of Greenland's five municipalities has specific harvesting quotas. Contrary to its Northern fellows, Greenlandic salmon/Kapisilllit is solely for local use. No export of whale and seal meat is allowed either - they are strictly for domestic consumption. Certain species like the blue whale are strictly protected.

The Siu-Tsiu project is Greenland's first social enterprise, aiming at developing young people's skills and allow them to find meaningful job opportunities in their communities. Teaching them how to grow fresh vegetables is one way to help them get a foothold in the labour market, while supporting the local economy and well-being.

There is no private land ownership in Greenland and all land is public owned. The Upernaviarsuk experimental farm is the government's research and training center for the agricultural sector. Test programs are carried out for growing crops in sub-Arctic and Arctic conditions.

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THREE FOOD COMPANIES FROM GREENLAND

BY APPOINTMENT TO THE ROYAL DANISH COURT

Royal Greenland®

Fishing, processing and seafood trade company, with 100 % of the shares owned by the Greenlandic Government

POLAR SEAFOOD

Largest privately owned fishing company operated in Greenland, and one of the top seafood exporters in Scandinavia

Halibut Greenland

Seafood company primarily owned by local fishermen in northern Greenland, focused on greenland halibut and atlantic cod

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Nuuk has 13 restaurants and more than 50 restaurants are registered in Greenland. None of them mentioned in the Michelin Guide.

However, the World's northernmost and most remote Michelin-star restaurant - KOKS - temporarily moved from the Faroe Islands to Greenland in late 2022, until early 2024.

KOKS' Head Chef Poul Andrias Ziska (source: koks.fo)

TRADE

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TRADE AGREEMENTS

Greenland has bilateral or trilateral fisheries agreements with **the Faroe Islands**, **Norway**, **Iceland** and Russia. However, the Greenlandic governments announced in December 2002 that quota-swapping on fisheries with Russia are now frozen for 2023.

While the autonomous country is no more part of the **European Union** since 1985, Greenland is, as part of the Kingdom of Denmark, an Overseas Country associated with the EU. Greenland, the EU and Greenland and Denmark have also concluded a **fisheries partnership agreement** in 2015, which has been renewed in 2021 to extend until 2025.

Negotiations on trade between Greenland and the **United Kingdom** were officially launched in January 2022. A Free Trade Agreement would *inter alia* aim at reducing the tariffs on seafood.

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TRADE BALANCE

FOOD EXPORT

$701 million (2021)

Seafood is Greenland's top export, accounting for 95% of total exports in 2021.

Leading products: shrimps (48% of fish exports), halibut (27%) and cod (8%). Limited export of seal, whale and shark products.

Agriculture almost exclusively feed the domestic market. Exports are limited to livestock products.

Leading products: sheep products compose 65% of total agricultural exports.

Most export to: Denmark (85.3%), Latvia, Portugal and Iceland

FOOD IMPORT

$164 million (2021)

Food, beverages and tobacco is the second imported commodity behind transport equipments. Imported foods provided 75-80% of the energy consumed in adult Greenlanders

1. Processed food
2. Meat products
3. Dairy Products

Most import from: Denmark, Norway, Sweden and other EU countries

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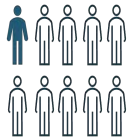
LOCAL FOOD

FOOD SECURITY & SELF-SUFFICIENCY



17% self-sufficiency: a study from 2021 concluded that **1 in 10** Greenlanders are **food insecure**.

21% reported food insecurity in **East and North Greenland** compared with **7% in West Greenland**. It bears witness to the socio-spatial disparities in food security.

80% of food in **supermarkets is imported**.

Food items are not always affordable due to high shipping cost. In North and East Greenland, the supply ship is not able to sail through the ice between October and May. In Qaanaaq in North Greenland, a ship calls only twice a year.

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LOCAL AND INDIGENOUS ECONOMIES

Source: Inuit Circumpolar Council, *Circumpolar Inuit Protocols for Equitable and Ethical Engagement*, 2022

Kalaalimernit, the traditional Greenlandic diet, is mainly composed of **marine mammals, fish, and wild fowl**, supplemented with terrestrial species, particularly reindeer and some local plants, such as seaweed and berries.

It is estimated that more than **65%** of Greenland households fish, hunt and gather about a **half or more of their consumption of fish and meat**, and **¾ of Greenlandic households hunt** for at least one item of their daily food.

A **license** is required for all hunting and fishing activities. Quotas and regulations are determined for individual species by the **Ministry of Hunting, Fishing, and Agriculture** and distributed by the municipality.

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RESEARCH & POLICY

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RESEARCH AND POLICY

Food Hubs/Clusters

Inuit Sila
Upernaviarsuk experimental farm
FoodLab Greenland
NERISA – an Arctic Food Cluster
New Arctic Kitchen

Science and Education

Grønlands Naturinstitut /Greenland
Institute of Natural Resource,
Upernaviarsuk agricultural school
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University of Greenland

Dietary Guidelines

Greenland Nutritional Board. Food-based Dietary Guidelines (2005)

Ministry of Food, Agriculture and Fisheries of Denmark. Official Dietary Guidelines (2021)

**The Greenland Board of Nutrition recommends its citizens to increase the consumption of fish and terrestrial animals but to reduce the intake of marine mammals to limit the intake of persistent organic pollutants and mercury.*

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EXAMPLES OF SUPPORT AND INVESTMENT

The **Nordic Council Environment Prize 2018** was awarded to the local fishermen and hunters of the Natural Resource Council of Attu in western Greenland for their observations of the natural environment and the state of living resources in the area. A sum of **DKK 350,000** follows the prize. In 2021, Greenlandic Greenhouse has been nominated for the Nordic Council Environment Prize, whose theme was Sustainable food systems. This start-up grows sustainable, pesticide-free local food using hydropower energy.

The new **Sustainable Fisheries Partnership Agreement** (SFPA) and a new Protocol negotiated in 2021 between Greenland and the EU are designed to strengthen cooperation in the fisheries sector until 2025 with the possibility of a two-year extension. The crux of this agreement is to will allow the EU fleet (12 large-scale industrial trawlers) to continue fishing in Greenland waters. The EU is providing Greenland with an annual financial contribution of **€16.5 million**, with €2.9 million per year specifically tailored to promote the development of the fisheries sector in Greenland. For the whole duration of the protocol, the estimated amount is of **€99 million**, and EU ship-owners have also to pay license fees for the fishing opportunities.

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EXAMPLES OF SUPPORT AND INVESTMENT

In December 2022, a project of the **Department of Agroecology at Aarhus University** received **DKK 2.8 million** from the Inge Lehmann programme under Independent Research Fund Denmark. The project is examining Greenland soil and finding can result useful for developing local agriculture.

In February 2023, **Royal Greenland** was granted **DKK 5,5 million** in funds from the GUDP (Green Development and Demonstration Programme) under the Danish Ministry for Agriculture and Food, to scale up of seaweed farming in Greenland. Royal Greenland started seaweed cultivation on an experiential scale back in 2018.

As part of the EU's Overseas Countries and Territories, Greenland is associated with the EU's **Horizon Europe** program. Greenlandic projects and researchers can hence the EU's €95.5 billion programme. Greenland is finally covered by the **Northern Periphery and Arctic Programme**, the EU funded scheme addressing challenges facing peripheral and remote communities in the Arctic and North Atlantic region.

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Living resources, including fish, shellfish and marine mammals shall be harvested in a sustainable manner based on sound science.

The Greenland fishery industry is facing a structural challenge of adjustment, including the need of larger and more modern vessels and the need for future regulation of the industry in relation to ownership provisions and access to capital.

Denmark, Greenland and the Faroe Islands will work to ensure that the utilisation of living resources, including marine mammals, is founded upon an ecosystem-based management model that places emphasis on scientific foundation and sustainability.

Kingdom of Denmark Strategy for the Arctic 2011–2020

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TAKEAWAYS

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STRENGTHS OF GREENLAND'S FOOD SYSTEM

Strong traditional foodways and subsistence economy

Focus on the socio-economic benefits of development for the Greenlandic people

Location with easy access to the north American and European markets

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KEY AREAS FOR DEVELOPMENT

Investing in Research & Innovation

Activities in research and innovation in the seafood sector should be expanded as well as experiments into local food production where it makes economic sense.

Incentivizing infrastructure development

Food exports and tourism opportunities are currently hindered by limited infrastructure, including roads and processing and storage facilities, so that processing of fish products could take place locally instead of exporting the primary product. Incentives should be created for private industry to investment in infrastructure development.

Focusing on renewable energies

Renewables account for a relative small portion of Greenland's energy consumption. Low-carbon solutions, especially hydropower, should be proposed for producing, processing and distributing food using local energy sources, as alternative to run diesel generators in small settlements, and to fuel air and ocean shipments.

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FAROE ISLANDS

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FAROESE FOOD

The Faroe Islands' largest sector is the fishing industry. Together with maritime services, seafood products constitute the core of the Faroese economy, which is ranked amongst the highest in the world based on GDP per capita.

The marine ecosystems around the Faroe Islands are diverse and abundant. The temperate oceanic waters and strong currents in the fjords are also ideal for fish farming. Local fish products are renowned for their high quality, such as Faroese Cod, Langoustines and farmed Salmon. There are no indigenous land mammals in the Faroe Islands. The few found today were introduced from other Northern countries. Turnips, beets, potatoes and carrots are among the few vegetables growing here. Barely anything grows above ground.

One of the most unique dishes of the Faroe Islands is *skerpikjøt*, naturally wind-dried fermented lamb - a prime example of this traditional curing technique. The unique smell and taste of this Faroese delicacy describe perfectly what Faroese call *ræst*, a distinct flavor similar to the Japanese *umami*.

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Aquaculture, and salmon farming in particular, is regarded as one of the best solutions for [more] sustainable food production when considering sustainability in the broadest sense. The Faroe Islands offer many opportunities – thus it is of vital importance that the will, skills and regulations facilitate the utilization of these opportunities.

Regin Jacobsen, CEO of Bakkafrost

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OVERVIEW

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KEY FIGURES

ECONOMY

GDP: **$3.36 billion** (2021)

Unemployment rate: **2.2%** (December 2022)

PEOPLE

54,159 inhabitants (December 2022)

Native Faroese people make up **88%** of the population

ENVIRONMENT

1,289 km of **coastline**

An archipelago of 18 volcanic islands

Kalsoy Island is James Bond's final resting place after *No Time to Die*

ENERGY

52% of electricity production from renewables (2022)

Hydro power (42.7%), wind power (12.7%), then geothermal, biomass, solar and tidal energy

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KEY SECTORS

Fishing industry

Each year, about 1,400,000 tons of seafood are caught.

Tourism

The archipelago welcomes on average 110,000 visitors each year.

Maritime services

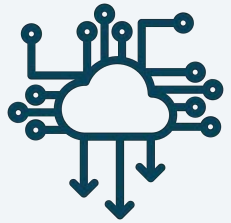
Faroese companies offer their services and expertise as sub-contractors in the fisheries, mining and oil sectors, as well as for shipbuilding and repair.

Financial services

4 banks, 2 insurance companies, 2 life insurance companies and some public funds.

Energy

6 hydroelectric plants, 4 diesel plants and several wind power plants.



ICT & Tech

Faroese companies are world experts in providing digital communication solutions to remote and sparsely populated areas.

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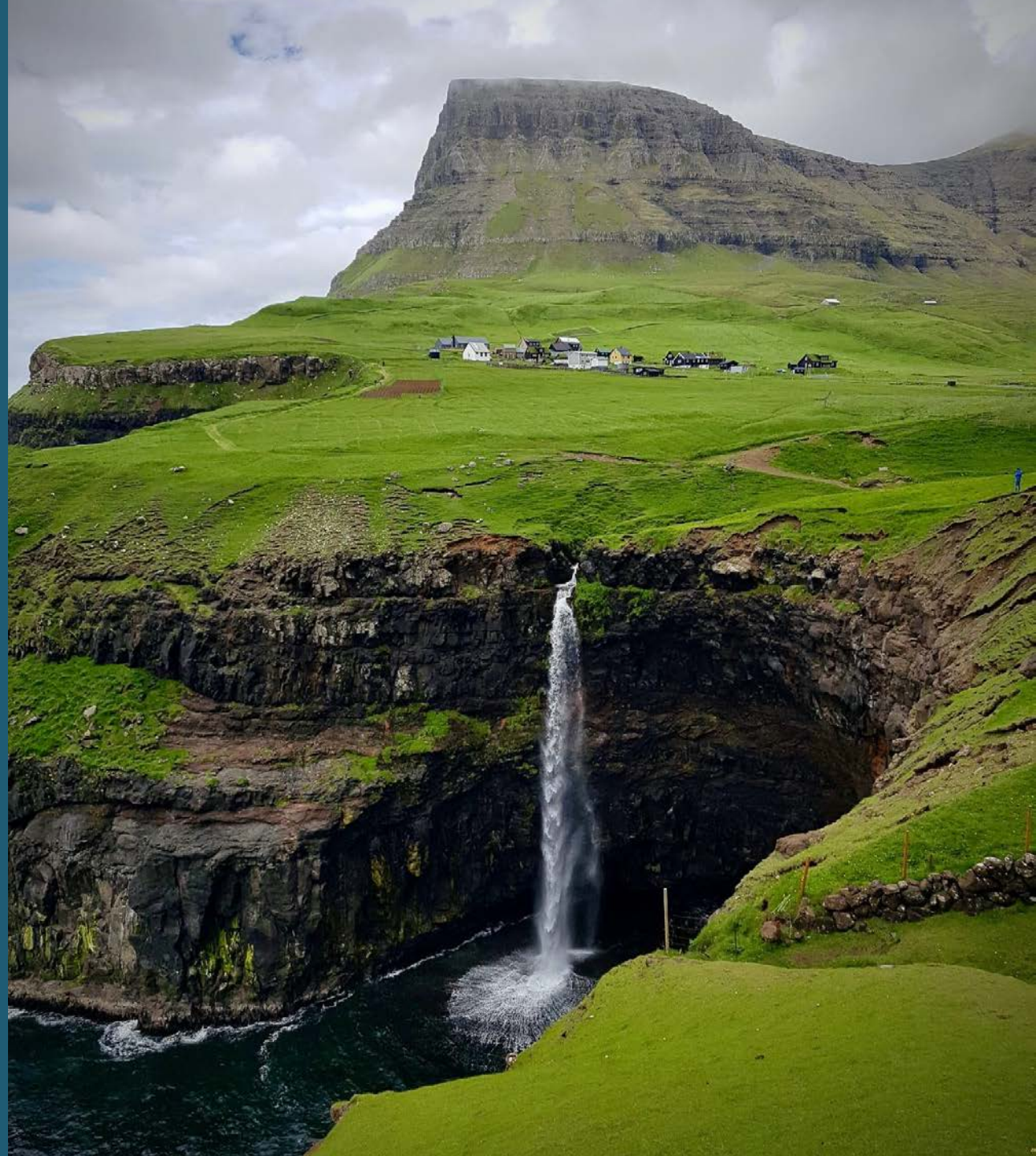
THE FOOD SECTOR

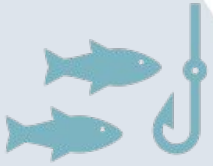
The Faroes Islands' Food Sector in Short

The Faroese economy is depend on the fishing and aquaculture industries

Agriculture, forestry, and fishing account for 14.2% of GDP, without taking into account related industries (2021)



FOOD ECONOMY



Blue Economy

$739 billion Fish and fish-related industries (2021) - **22% of GDP**

Fishing industry alone employs **15% of the workforce**

3rd largest producer of farmed salmon in Europe with about 95 thousand tons (2021)

Main commercial species are cod, haddock, coalfish, and redfish, and main farmed fish is salmon

Green Economy

$62.8 million agriculture, mining and quarrying sector(2020)

About **96 million hectares of agricultural lands**, **16 dairy farms** and **80,000 sheep** (2019)

Almost exclusively centred around dairy farming and sheep and lamb production

Service Economy

$333.5 million Wholesale and retail trade, hotels and restaurant sector (2021)

$240 million Manufacture of food products and beverages sector (2021)

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3 FOOD-RELATED FACTS

In 2018, the Faroese Parliament passed the "Act on Management of Marine Resources", which states that "all living marine resources in Faroese waters are property of the people of the Faroe Islands". This implies that fish stocks are a public good and fishing licences may only be granted to Faroese owned operators. It inter alia exclude foreign ownership of quotas.

The islands have one dairy processor, one farmers' merchant and no abattoir. All animals are slaughtered on farm and sold directly to the islands' consumers, retailers, and food service outlets. This raises the issue of food safety and traceability.


Faroe Islands holidays

Faroe Islands: the new Nordic food frontier

There's more to Danish cuisine than Noma. Out in the north Atlantic, Michael Booth finds a new Nordic frontier as Faroe Islands chefs raise traditional foods to new levels of pleasure

Michael Booth

In 2013, The Guardian proclaimed the Faroe Islands the "new Nordic food frontier" and the "Nordic Hawaii" in view of the archipelago's culinary heritage and the visionary cuisine of Faroese chefs.

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THREE FOOD COMPANIES FROM THE FAROES

BAKKAFROST

ESTABLISHED 1968

Leading producer of salmon from the Faroe Islands and one of the world's most vertically integrated salmon farming companies

HIDDENFJORD

RAISED IN THE WILD

A family-owned Faroese company producing high-quality salmon products

POUL HANSEN

Largest wholesaler in the Faroe Islands, also including Krás as its own certified slaughterhouse and food producer

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There are 3 Faroese restaurants mentioned in the Michelin Guide - KOKS, ROKS and Ræst.

KOKS is the World's northernmost and most remote Michelin-star restaurant, with 2 stars on its belt. It has relocated for two seasons in Greenland for building new facilities but plans to hopes to reopen on its native Faroe Islands in 2024.

Source: koks.fo

TRADE

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TRADE AGREEMENTS

The Faroe Islands have concluded free trade agreements with **Iceland**, **Norway**, **Switzerland** and **Turkey**, mostly regarding tariffs on Faroese fish products. The **United States** and the Faroe Islands signed a Partnership Declaration in 2020, including trade-related dispositions.

The Faroe Islands are neither part of the European Union nor a member of the European Economic Area nor an Overseas Country and Territory. The EU-Faroe Islands free trade relationship came into effect in 1997 and is made up of 3 separate bilateral agreements on fisheries, trade in goods and scientific and technological cooperation. **The EU** is the Faroe Islands' biggest trading partner. Exports to EU countries were worth €566 million in 2020, dominated by fishery products (91%).

The bilateral Free Trade Agreement between the Faroe Islands and the **United Kingdom** entered into force on 1 January 2021. It provides for the same tariff regime as before UK-EU withdrawal.

After suspending its sales of fish products to **Russia** in May 2022, the fisheries agreement between the two countries has been renewed for 2023. The Faroese government still condemns the Russian aggression against Ukraine.

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TRADE BALANCE

FOOD EXPORT

$1.68 billion (2022)

Seafood account for 92% of total exports value making the Faroe Islands the largest per capita fisheries and aquaculture nation in the world.

Leading products: farmed salmon/trout (48%), mackerel/herring/blue whiting (16%), cod/saithe/haddock (15%).

Very few agricultural exports.

Leading products: sheep and lamb meat.

Most export to: EU countries (51.1%, mainly from Denmark), the UK, the USA, Russia

FOOD IMPORT

$ 320 million (2022)

Food and live animals account for 18% of the total value of goods' import.

1. Processed food
2. Fruits and vegetables
3. Cereals and grains

Most import from: EU countries (67.8%) with 40% Denmark) and Norway

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LOCAL FOOD

FOOD SECURITY & SELF-SUFFICIENCY

A **22% degree of self-sufficiency**, according to the report “Food self-sufficiency in five Nordic island societies”, funded by by the Nordic Council of Ministers’ Working Group for Circular Economy.

Grazing sheep provide **60% of all locally produced meat**, **lamb production is 50% self-sufficient** and 6**% of potatoes** are locally grown.

In Faroese agriculture, only the **dairy sector** is close to reaching its potential. Domestic production almost entirely covers milk needs. A dairy processing plant has recently been built to expand yogurt, butter and cream production.

Subsistence hunting, fishing and gathering provide an important part of Faroese diet, including catching of sea birds, pilot whales and other small whales hunting and household horticulture.

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LOCAL AND INDIGENOUS ECONOMIES

Dialogue on the future Faroese food system. Nordic House in Tórshavn on April 8th 2022 (source: norden.org)

In faroese, a distinction is made between ***føroyskur matur*** /"Faroese food" (based on locally available resources) and ***útlendskur matur*** "foreign food" (imported foodstuff).

Fat is a cultural keystone in the Faroese foodways. Traditional foods include tallow from sheep, fish fat and liver from codfishes, and the blubber from pilot whales.

The *grindadráp* embodies **Faroese whale hunting tradition**. The practice is reminiscent of the adaptation strategies settlers have used to acclimate before the importation of non-native products and livestock. Still today, subsistence whaling fills up a significant portion of Faroese households' fridge.

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RESEARCH & POLICY

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RESEARCH AND POLICY

Food Hubs/Clusters

ArcticHubs for fish farming in Suðuroy
Blue Resource / *Sjókovin*
Ocean Cluster Faroese
New Arctic Kitchen

Science and Education

The University of Faroe Islands
The Fisheries College / *Miðnám í Vestmanna*
The Maritime School / *Sjónám*
Faroe Marine Research Institute
The Aquaculture Research Station of the Faroes
Búnaðarstovan / Faroese Agricultural Agency
iNova
Research Council Faroe Islands
NORA

Dietary Guidelines

Ministry of Food, Agriculture and Fisheries of Denmark. Official Dietary Guidelines (2021)

**Specific guidelines by the Faroese government on the consumption of pilot whale as an important traditional food*

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EXAMPLES OF SUPPORT AND INVESTMENT

Several funds in the Faroe Islands offer financial support for research projects, including the Faroese Research Foundation, the Marine Research in the North Atlantic Ocean programme, the Fisheries Research Fund, and the Business Development Fund. The **Fisheries Research Fund** (Fiskivinnugransking/Fiskivinnuroyndir) is a government research fund established by the Faroese Ministry of Fisheries. It aims at developing the fishing industry, harvesting, processing and trade by stimulating scientific and industrial R&D projects in the areas of Marine Resources, Biotechnology, Fish Harvesting Technology, and Fish Processing Technology.

In May 2022, the Faroe Islands joined **Horizon Europe**. This means that Faroese researchers, innovators and research entities can apply yo the **€95.5 billion EU programme (2021-2027)**. In June 2022, SeaMark, a consortium led by Faroese seaweed farmer Ocean Rainforest and comprising 25 international, cross-disciplinary partners has been awarded a **$9.9 million grant** from the Horizon Europe development fund *"to upscale seaweed production and market applications across Europe"*.

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EXAMPLES OF SUPPORT AND INVESTMENT

In addition, the Faroes are covered by the **Northern Periphery and Arctic Programme**, the EU funded scheme addressing challenges facing peripheral and remote communities in the Arctic and North Atlantic region.

In 2020, the Faroese seaweed farming company Ocean Rainforest received a **$1.5 million** investment to help accelerate growth of offshore seaweed production in the Faroe Islands. This fund was led by the World Wildlife Fund, which committed $850,000, the rest coming from a mix of Faroese backers and board members.

In February 2023, Ocean Rainforest has also secured **$6.2 million** for further expansion of its seaweed farming operations. The funding is led by the US-based Grantham Foundation for the Protection of the Environment, Katapult Ocean's Deep Blue fund, Builders Vision and the Ocean Born Foundation.

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4) Research, Knowledge Advancement and Education: Knowledge based on research and science is a critical precondition for making appropriate decisions regarding nature and the environment in the Arctic; decisions which can ensure sustainable development and foster growth in the region.

6) Living Marine Resources: Fisheries in the Arctic context constitute a framework for countless opportunities for sustainable economic growth, and cooperation on research and knowledge about life in the ocean.

7) Economic Opportunities and Sustainable Development: Flourishing living conditions in the Arctic are reliant on a diversity of economic opportunities and jobs, which encourage people to move to and thrive in the region.

2022 Arctic Strategy of the Faroe Islands

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TAKEAWAYS

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STRENGTHS OF THE FAROES' FOOD SYSTEM

A highly developed communication network

An expertise in maritime services and consultancy

Strategic position as a maritime hub in the Northeast Atlantic

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KEY AREAS FOR DEVELOPMENT

Diversifying the economy

The drawback of the Faroes' highly developed fishing sector is that the economy is more vulnerable to negative economic shocks and geopolitical conflicts. In addition, Denmark still provides an annual block grant of approximately $103.4 million. Diversification of the economy involves developing the tourism sector, using geothermal/wind energy for greenhouse farming, and scaling-up agriculture.

Supporting agricultural development

More grants and funding opportunities should be provided for agricultural and horticultural projects and research. This also involves building new infrastructures through public-private partnership, including greenhouse facilities and an official abattoir, to ensure sufficient and safe food production.

Focusing on renewable energies

The Faroe Islands are rich of abundant renewable energy sources, whose potential is yet to be fully fulfilled for energy and food self-sufficiency. The agricultural and horticultural development should be fueled by these low-carbon resources for production and along the supply chain.

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CANADA

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ARCTIC CANADA'S FOOD

The Northwest Territories, the Yukon and Nunavut are Canada's three territories. Public administration and defense are the largest employer of the Canadian Arctic, while the share of mining is decreasing in the Northern economies.

Yukon and Nunavut are respectively the second-least and least populated territory in Canada. Most communities in Nunavut are located along coastlines, while Yukon and Northwest Territories have more inland communities situated along roads. The majority of communities have less than 500 residents. Only the territorial capitals, Whitehorse, Yellowknife and Iqaluit, have populations exceeding 5,000 people. The 3 territories are the home of several Indigenous Peoples, including Inuit, Athabaskan and Gwich'in peoples.

The food systems of the Canadian Arctic is characterized by the integral part play by the subsistence economies in providing local communities for their livelihoods. Hunting and animal husbandry of moose, caribou, elk, bison, and muskox, as well as berry picking and plant small-scale cultivation, are the most important subsistence practices.

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In addition to [their] very important social, cultural, and economic benefits, nutrient composition analysis has shown that traditional foods [including caribou, seal, and other land and marine mammals and fish] provide excellent sources of protein, long-chain (LC) n3 fatty acids, selenium (Se), iron (Fe), zinc (Zn), and vitamins A, D, and E.

Brian et al., Dietary Advice on Inuit Traditional Food Use Needs to Balance Benefits and Risks of Mercury, Selenium, and n3 Fatty Acids, The Journal of Nutrition, Volume 143, Issue 6, June 2013

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OVERVIEW

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KEY FIGURES CANADIAN ARCTIC

ECONOMY

Yukon: **$2.93 billion** GDP/ **5.5%** unemployment
NWT: **$4.33 billion** GDP/ **8.6%** unemployment
Nunavut: **$3.45 billion** GDP/ **16.9%** unemployment

In 2021, less than 1% of Canada's GDP combined and compared to a 5.3% unemployment rate nationally

PEOPLE

About 114,000 inhabitants <1% of Canada (2021)
40,232 Yukon/ 41,070 NWT/ 36,858 Nunavut

More than **½ of inhabitants** identified as **having Aboriginal ancestry**
23% Yukon/ 51% NWT/ 83% Nunavut, 98,7 % of Inuit

ENVIRONMENT

162,000 kms of Arctic coastline
Twice as long as the Atlantic and Pacific coasts combined

40% of Canada's landmass and **25% of the Arctic region**

ENERGY

3 lowest total energy demands in Canada

Yukon's energy: **82.8% hydropower** (2020)
NWT's energy: **46.8% of hydropower** (2019)
Nunavut's energy: almost exclusively from **imported diesel fuel** (2019)

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KEY SECTORS

Public sector

About ¼ of working-age Northerners are employed in government, social and health services.

Mining

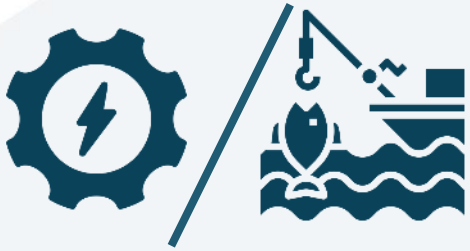
Mining and quarrying (diamonds, gold, silver, lead, zinc) account for 13.2% of RDP, 36% in NWT.

Financial services

Third largest industry, including finance and insurance, real estate and renting, and leasing and management of companies and enterprises

Tourism

Much of the North's tourism is based on sports hunting and fishing



Energy/Fishing

⅓ of Canada's remaining oil and natural gas resources. There is no primary energy production Nunavut, where commercial fisheries are however a major employer.

Construction

The industry has developed innovative solutions for Arctic construction.

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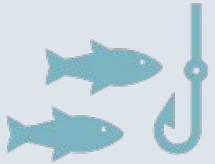
THE FOOD SECTOR

Arctic Canada's Food Sector in Short

Agriculture, forestry, fishing and hunting (2020)

- *NWT: <1% employment/ $7.9 million/ 0.2% GDP*
- *Yukon: 2% employment/ $4.4 million/ 0.2% GDP*
- *Nunavut: 1% employment/ $15.3 million/ 0.5% GDP*

FOOD ECONOMY



Blue Economy

6.4% of GDP and **8.3% of employees** of **Yukon**

4.7% of GDP and **8.1% of employees** of **the NWT**

7.7% of GDP and **10.3% of employees** of **Nunavut.** Fisheries provides a **growing contribution** to Nunavut's economy

Major commercial fisheries: turbot, northern and striped shrimp, Greenland halibut, and Arctic char

Green Economy

Yukon and NWT: respectively **$2.6 million** and **$3.4 million** (2020) **crop and animal production**, less than 1% of GDP/ Agriculture mostly takes place in the **southern parts**

In 2021, 88 farms were reported in Yukon and 8 in the NWT. **Poultry and egg farming** account for ⅖ of gross farm receipts/ ¼ of all farms produce crops. **Oats** is the main production

In Nunavut, commercial crop and animal production is not significant

Service Economy

Accommodation and food services: **1,285 workers, 2% of GDP in Yukon**/ **1,055 workers, 1,5% GDP in NWT**/ **360 workers in Nunavut**

Food services and drinking places: **$32.5 million in Yukon**/ **$30.1 million in NWT**/ **$ 6.1 million in Nunavut**

Food and beverage stores: **$32.5 million in Yukon**/ **$45.5 million in NWT**/ **$82.7 million in Nunavut**

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3 FOOD-RELATED FACTS

Canada has never led an active fishing industry in the North. Fish stock are mostly harvested by local and indigenous communities or for scientific research. Nunavut is the only Arctic territory where commercial fishing have a significant role in the local economy.

Agricultural production in the Canadian north is a very minor economic sector, mostly conducted in small-scale farms, community gardens, and greenhouses. Yukon and the Northwest Territories are witnessing some agricultural development.

Food services is the most profitable food-related industry in the Canadian North, according to Statistics Canada.

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THREE FOOD COMPANIES FROM NORTHERN CANADA

Family farm, located in the Ibex Valley, raising grass-fed beef and sourcing grains from local yukon farmers

Harvesting of harvests shrimp and turbot quotas from Qikiqtaaluk Corporation, Unaaq Fisheries Inc., and other Nunavut and southern quota holders

Largest commercial egg operation, products sold in Hay River, Fort Smith, Fort Simpson and Yellowknife, with plans to expand to other communities

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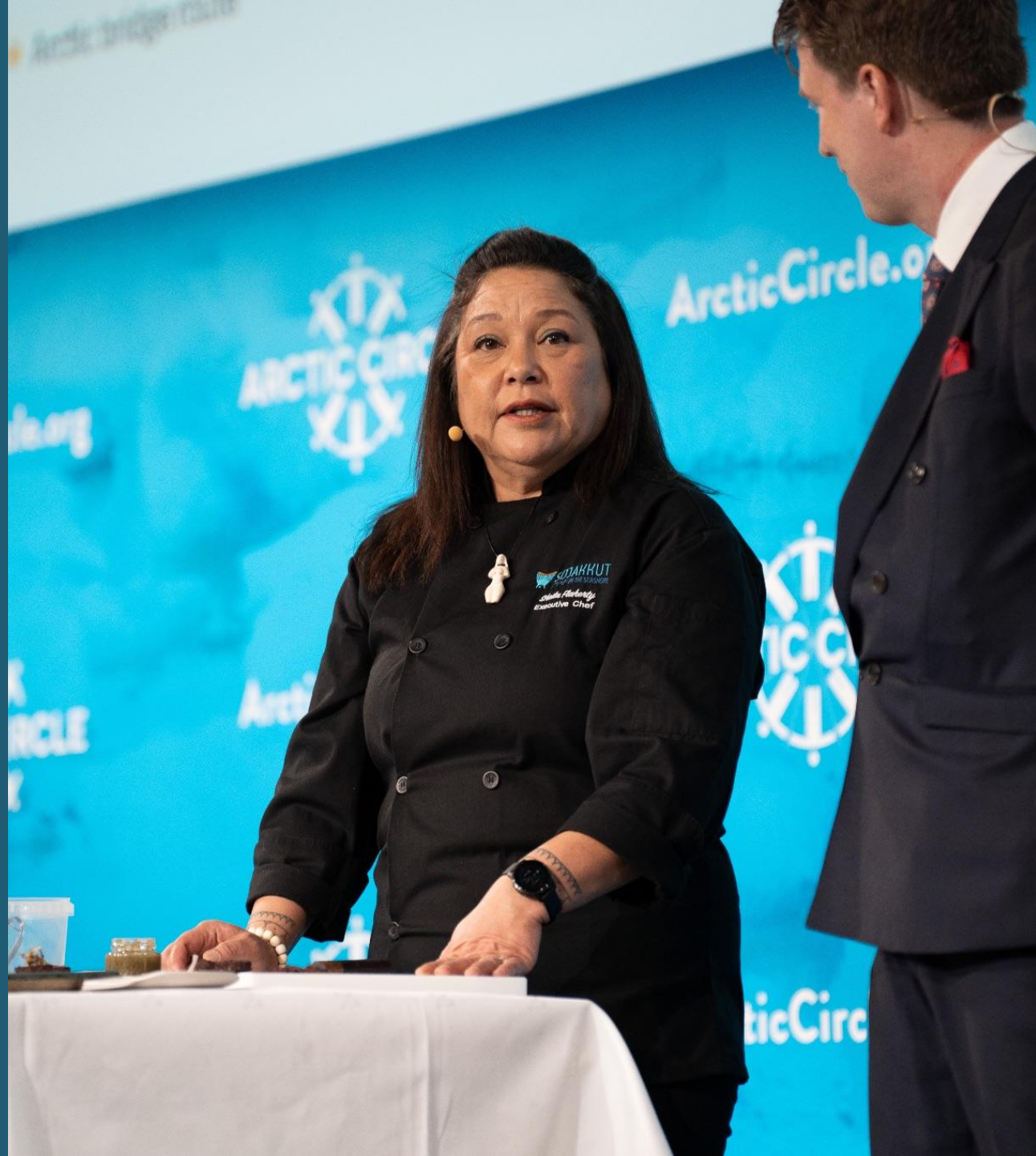
The prestigious Michelin Guide visited Canada for the first time in 2022. A total of 14 restaurants has been awarded with one star, exclusively in Toronto and 6 of them specialized in Japanese Cuisine. Aboriginal Peoples' foodways has yet to receive any recognition and the Canadian Arctic has not enjoyed the presence of Michelin inspectors.

Northern cuisine is no less led by passionated chefs, who are both revitalizing local and Aboriginal foodways and drawing inspiration from other cultures.



Inuk Chef Chef Sheila Flaherty (source: Arctic Circle)

TRADE

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TRADE AGREEMENTS

Canada currently has **15 free trade agreements** with **51 different countries**. The **U.S.A.** is the first international market for Canadian enterprises through the CUSMA, also involving **Mexico**.

The **European Union** is Canada's second-largest trading partner. The CETA provides Canadian businesses with preferential access to the EU market. Canada also has a free trade agreement with the EFTA countries of **Iceland**, **Liechtenstein**, **Norway** and **Switzerland**.

The CPTPP is a free trade agreement between Canada and 10 other countries in the Indo-Pacific region, including **Australia**, **Brunei**, **Chile**, **Japan**, **Malaysia**, Mexico, **New Zealand**, **Peru**, **Singapore** and **Vietnam**.

In addition, Canada has concluded separated bilateral trade agreements with Chile, **Colombia**, **Costa Rica**, **Honduras**, **India**, **Israel**, Japan, **Jordan**, **South Korea**, **Panama**, Peru and **Ukraine**. The Canada-**United Kingdom** Trade Continuity Agreement entered into force on April 1, 2021.

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TRADE BALANCE

FOOD EXPORT

$180 millions

23% Yukon/26% NWT/ 51% Nunavut (2019)

75 million kg of marine products/year, about 85% of northern Canada's total food export. In 2019, export of fishery products were worth $1 million in Yukon, $2.1 million in the NWT and $73 million in Nunavut.

Export of animal products represented $588,000 in Yukon and 4.4 millions in the NWT in 2019. Yukon was the leading regional crop exporter with $1.3 million.

80% of food products exported from Nunavut are marine products, whereas prepared meals represent about 95% of food exports from Yukon and the NWT.

Most export to: Interprovincial (67% for Yukon, 90% NWT and 98% Nunavut), United States, China, Mexico, EU

FOOD IMPORT

$390 million (2019)

It is estimated that 98 % of food products consumed in the NWT and Yukon and 72- 83% of those in Nunavut are imported from outside the territories.

1. Processed food
2. Meat and dairy products
3. Fresh fruits and vegetables

Most import from: Interprovincial (about 60%), United States, China, Mexico, EU

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Food industries are producing large volumes of food commodities that are nutritious, potentially more affordable, and culturally compatible with Indigenous\local food preferences. While redirecting commercial food production in Northern Canada from an export driven to a regionally driven value chain will not be without economic and logistical challenges, it does offer an opportunity to bring greater balance to Northern Canada's food system.

Arctic Council's Sustainable Development Working Group

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LOCAL FOOD

FOOD SECURITY & SELF-SUFFICIENCY

According to the 2017-2018 Canadian Community Health Survey, **household food insecurity** was **57% in Nunavut**, **21.6% in the NWT**, and **16.9% in Yukon**, compared with a 12.7% average for the rest of Canada.

7 out of 10 households in Nunavut face **moderate to high food insecurity** and **lack access to healthy and affordable food**. This is 6 times higher than in the rest of Canada.

Local foods make **9-38 %** of total calories consumed in **Yukon** and **17-28 % in Nunavut**, depending on each community (urban or rural) and the seasons.

Statistics Canada estimates that roughly **$40 million dollars of traditional food is produced each year** in the Canadian Arctic. Participation in subsistence economic activities is highest in Nunavut and lowest in Yukon.

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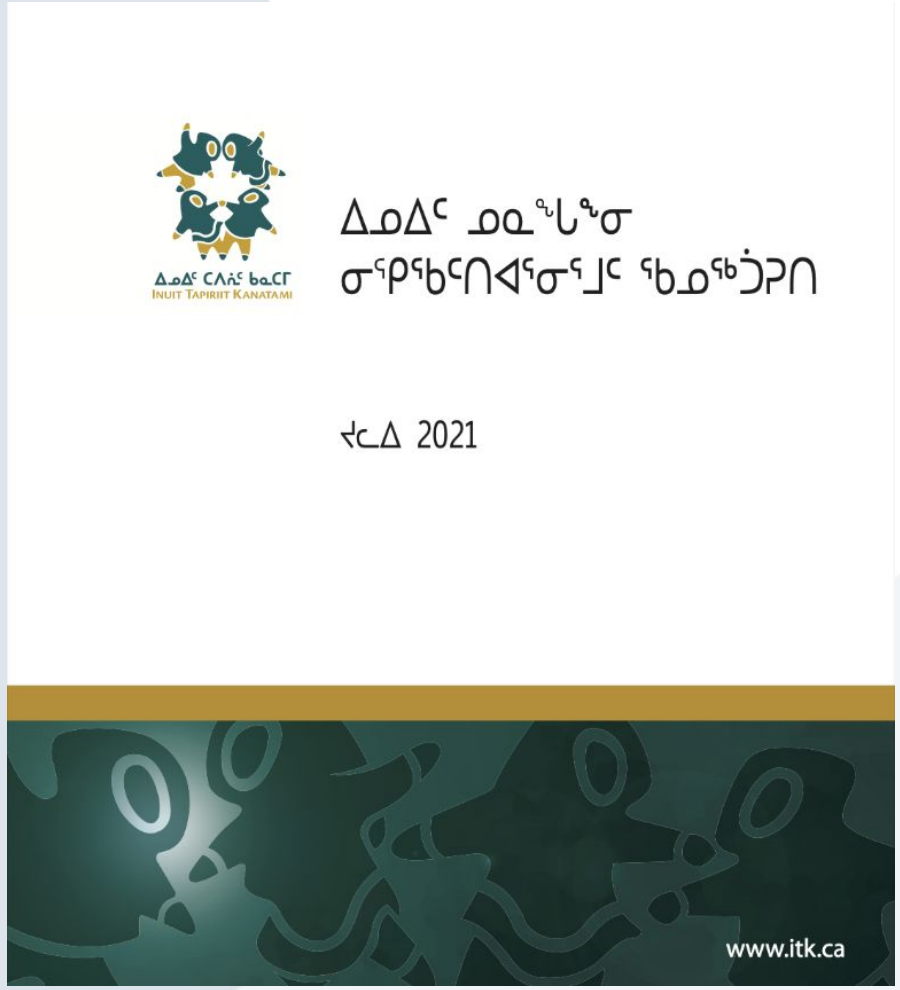
LOCAL AND INDIGENOUS ECONOMIES



Source: Inuit Nunangat Food Security Strategy, Inuit Tapiriit Kanatami, 2021

The term "**country food**" is used to describe any food that the earth supplies, including caribou, Arctic char, salmon, musk ox, seal, whale, seafood, birds and berries.

More than **70% of the adults in Nunavut harvest and eat country food**. Fishing, hunting and trapping accounts for 15,3 million USD of territorial GDP. **Licenses are not required for Inuit to hunt or fish**. The Nunavut Land Claims Agreement gives all beneficiaries the right to free disposition which allow any beneficiary to harvest and sell their catch to support themselves and their families.

Yukon, the NWT, Nunavut are among the six jurisdictions allowing **hunting of polar bears**. **Seal hunting** is an important source of income and food in small coastal communities. An estimate of over 40,000 seals are harvested per year in Nunavut. The seal meat sector is worth approximately $5 million.

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RESEARCH & POLICY

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RESEARCH AND POLICY

Food Hubs/Clusters

Soon a CIFST Food Cluster
Circumpolar Agricultural Association
New Arctic Kitchen
Food Network Yukon
Yukon Agricultural Association
Amorak Hunter and Trapper Association
Nunavut Fisheries Association
Nunavut Food Security Coalition
Iqaluit's Qajuqturvik Community Food Centre
Kitikmeot Inuit Food System Programs and Knowledge Hub

Science and Education

Arctic Research Foundation
Bioenterprise Canada
Yukon Food For Learning Association
Yukon University
Yukon Seed Library
Nunami Sukuijainiq
Aurora Research Institute
Aurora College
Nunavut Arctic College

Dietary Guidelines

Health Canada, Canada's Dietary Guidelines (2019)

Inuit Tapiriit Kanatami, An Inuit-Specific Approach for the Canadian Food Policy (2017)

**Inuit have access to affordable, nutritious, safe and culturally preferred foods that are available through a sustainable food system that reflects Inuit societal values and supports well-being.*

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EXAMPLES OF SUPPORT AND INVESTMENT

The **Canadian Northern Economic Development Agency** (CanNor) is the main federal department dealing with Canada's Arctic territories. Its mandate is to support Northern communities, *inter alia* through providing funds for **economic development.** In 2020, the Government of Canada announced nearly $4.6 million in federal investments delivered through CanNor to help the Nunavut, Northwest Territories and Yukon agri-food sectors innovate, grow and create jobs. CanNor invested nearly $600,000 in 2021 to support 8 agriculture and food-related projects across Yuko, as well as $3.2 million for promoting Nunavut's fishing and sealing industries.

In 2021, CanNor also launched the **Northern Food Innovation Challenge**. This initiative aims to support community-led projects to help improve food security in Canada's territories. Five Nunavut organizations have also been selected by CanNor to receive up to $250,000 from the federal government to test their ideas for how to address hunger and malnutrition.

Since 2022, CanNor is investing $1,140,00 towards a 3-year project with additional funding coming from the Government of Nunavut, the Department of Fisheries and Oceans, the Ocean Tracking Network, the Seals and Sealing Network, the Arctic Fisheries Alliance, and Baffin Fisheries. Total funding is $3,771,540. 3 fishing projects will received a $2.4 million boost from CanNor, and $1.2 million to the Nunavut Fisheries Association to monitor stock sustainability and to explore the possibility of adding new species to Nunavut's commercial fisheries. In the NWT, over $550,000 was announced to go toward 5 Indigenous projects.

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EXAMPLES OF SUPPORT AND INVESTMENT

The **Department of Industry, Tourism and Investment** has its own Northern Food Development program, through which funding is provided to support commercial farming, fishing and other similar industries with the goal of promoting locally grown or harvested food. This includes a **Harvesters Support Grant** to help lower the high costs associated with traditional hunting and harvesting activities, as well as infrastructure investment totaling over $190 million to build multi-use buildings, food processing units and harbours. Indigenous Services Canada also supports Indigenous food systems. For instance, in March 2021, the Government of Canada announced a $8 million fund to help the 4 Inuit Land Claim Organizations address food insecurity in Inuit Nunangat.

The **Canadian Agricultural Partnership** (CAP) was a $3 billion five-year (2018-2023) investment agreement between federal, provincial and territorial government to strengthen and grow Canada's agriculture and agri-food sector. For example, in February 2021, the Governments of Canada and the NWT announced a $400,000 investment under the CAP to increase the production of fresh, healthy and locally-grown food in the NWT's agriculture sector and $1.21 million is invested annually to support the growth of agriculture.. Under the CAP program, the Yukon also received approximately $760,000 a year in federal funding to help encourage the development of small and medium farm operations. The **Sustainable Canadian Agricultural Partnership** is the new $3.5-billion, 5-year agreement (2023-2028), to strengthen the competitiveness, innovation, and resiliency of the agriculture, agri-food and agri-based products sector.

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To build stronger communities, there is funding for community-led food production projects and skills training for local and Indigenous food production systems. Recent federal investments and policy development undertaken in cooperation with Indigenous peoples will help strengthen food security in Arctic and northern communities and reinforce Indigenous connections with wildlife and the land, as called for in the Inuit Nunangat chapter.

Eliminating food insecurity includes both affordable food from the grocery store, as well as having access to traditional food to support a healthy diet, community well-being and connection to local cultures and traditions.

2022 Canada's Arctic and Northern Policy Framework

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TAKEAWAYS

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STRENGTHS OF ARCTIC CANADA'S FOOD SYSTEM

Strong local and Indigenous cultural roots

Support mechanisms in place at different government levels

Trade connection with American, European and Asian markets

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KEY AREAS FOR DEVELOPMENT

Building infrastructures

Private-Public partnerships are needed to tackle the infrastructure gap in the Canadian North: roads, housing, ports, fibre optic cable, and airports with long-enough runways. This also include building educational and research facilities across Arctic Canada.

Harvesting the potential for domestic food production

The share of subsistence economies to household's plate should be supplemented by sufficient domestic food production. Developing sustainable commercial fishing, agriculture, horticulture and aquaculture should be a priority for Northern food policies, including through innovative practices.

Improving coordination between actors and sectors

The Canadian Arctic is not a homogeneous entity, but is covered by different levels of governments, ecosystems and socio-cultural realities between and within its 3 territories. Efforts should be dedicated to foster cooperation and dialogue to connect policymakers, industries and communities.

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NORWAY

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NORTHERN NORWAY'S FOOD

Northern Norway is made of the counties of Troms, Finnmark and Nordland, plus the Svalbard archipelago. Public administration and defense are the main employer of the Norwegian Arctic. But the hydrocarbon industry and the fishing-aquaculture industry are respectively the first and second largest sectors of the regional economy.

The food repertoire of Northern Norway is as diverse as its ecosystems It is mainly characterized by being rich in fish and seafood: salmon, dried cod, whale meat and king crab to name a few examples. The seashore and beaches also constitute an abundant garden of seaweed and algae. The land also offer Northern Norwegians game meat, such as elk or reindeer. Both Lofotlam and Lyngenlam's lamb are officially certified as unique delicacies and have Norwegian protected geographical indication certification. Plant small-scale cultivation and berry picking have a strong tradition in Northern Norway, where cloudberry, blueberries and cranberries are especially abundant in the autumn months.

Fårikål, a mutton and cabbage stew, has repeatedly been named as Norway's national dish. Northern Norwegian dishes include the traditional Norwegian *fiskesuppe*, bacalao (a tomato based stew with vegetables), and *klippfisk* (dried and salted cod), but also reindeer stew.

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It has been documented in several horticultural products grown in Northern Norway that the low temperature, in combination with 24-hour light and longer photosynthetic activity, causes more crispy and juicy products with sweeter taste compared to the same product produced further south.

Natcher et al., The Arctic as a food-producing region in *Renewable Economies in the Arctic*, Routledge, 2021

OVERVIEW

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KEY FIGURES NORTHERN NORWAY

ECONOMY

$22 billion GDP (2020) / **2.5% unemployment** (2022)

About fifty-fifty Nordland and Troms og Finnmark

About 5% of Norway's GDP and compared to 3.2% unemployment rate nationally

PEOPLE

About 485,000 inhabitants (2022) - 9% of Norway

241,736 Troms og Finnmark/ 240,190 Nordland/ 2,500 Svalbard

Between **50,000-80,000** identified as **Sámi** + Kvens

Karasjok is the seat of the Sámi Parliament of Norway

ENVIRONMENT

12,020 km (without Svalbard)/ **15,607 km (with Svalbard) of Arctic coastline**

Norway's coastline is the second longest in the world

Northern Norway accounts for **⅓ of Norway's mainland territory**

ENERGY

72% of national energy consumption comes from **renewables** (2021)

66% from hydropower and 5,5% windpower

Renewables comprise about **99% of Norway's electricity production**

92% from hydropower, 7,5% from wind power (2021)

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KEY SECTORS

Public sector

Following the national trend, the public sector is Northern Norway's largest employer - education, health and social work, public administration and defense.

Energy

Northern natural resources play a prominent role in Norway been a leading hydrocarbon exporting nation, but also Europe's biggest producer of hydropower

Fisheries and Aquaculture

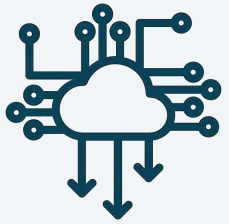
In 2020, the total catch amounted to 2.6 million tons and the total sale of farmed fish in Norway reached 1.5 million tons.

Tourism

Northern Norway has gained a reputation as a sustainable tourism destination

Mining

Coal mining remain one of Svalbard's main industries, with the only state-owned mine intended to close in 2025.



ICT & Tech

Telecommunications and marine technologies constitute a growing sector, with the UiT-The Arctic University of Norway being its incubator.

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THE FOOD SECTOR

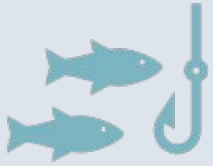
Norway's Food Sector in Short

Agriculture, forestry, and fishing comprise less than 2% of Norway's GDP

The food industry had a combined value creation of approximately $4.3 billion in 2018 and employed around 52,000 people

There are about 500 local food producers in Northern Norway

FOOD ECONOMY



Blue Economy

$2.1 million total catch value/ **$6.5 million total farmed fish value** (2020) - **The Seafood Industry is the 2nd largest contributor** to the national economy

About **10 000 full-time employment** both in fisheries and aquaculture (2020)

Fisheries and Aquaculture is the **largest export-sector in Norwegian Arctic** region. **Nordland** is Norway's 3rd largest exporter of aquatic products

Cod, salmon, herring, mackerel, shrimp, king and snow crab, and halibut

Green Economy

Northern Norway accounts for only **5%** of the country's **total agricultural production**

Most of agricultural value created in the North comes from livestocks, mainly for dairy farming. There are **1,312 producers of cattle**

Potatoes is the main horticultural production in Northern Norway, amounting to about 460 hectares. **Vegetables and berries** are grown on 65 hectares, and **cereals** provide only 0.1% of Norwegian cereal production

Service Economy

$2.2 billion Food service sector (2019)

6,060 enterprises in the restaurant and mobile food service industry (2018)

About **50,000 employees**

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3 FOOD-RELATED FACTS

The significance of Northern Norway's fishing resources for the national economy cannot be entirely reflected in official statistics. A large proportion of fish and seafood stocks is indeed harvested by companies with headquarters in the southern counties.

The northernmost active agriculture in the world is deemed to take in Northern Norway. Production is based on small-scale farms, with an average farm size of 20 hectares, and is mainly intended for the domestic consumption.

There are around 12,000 different species of seaweed in the world, and nearly 500 of them can be found growing in Norway. Seaweed is one of the world's most ancient food sources, and a sustainable option to feed today's world with highly nutritious food.

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THREE FOOD COMPANIES FROM NORTHERN NORWAY

Family-owned business established in 1877 and fourth largest brewery in Norway, located in Nordkjosbotn

Family-own company specialized in meat products with modern production facilities in Tromsø

Midnattsolpotet is Tromspotet AS' own brand for traditional North Norwegian potato varieties based in Silsand, Senja

48 Norwegian restaurants are recommended in the 2022 Michelin Guide. 12 of them have been awarded a one Michelin-star. Norway is also the home of two-star RE-NAA, in Stavanger, and three-star restaurants Maaemo, in Oslo.

None of the Northern Norwegian restaurants has received the Michelin Guide's spotlight until now. Norway's northernmost starred institution remains Credo, in Trondheim.

The White Guide - Nordics however recognises the Northern Norwegian gastronomy, including the restaurant Smak in Tromsø whose menu showcases local products.

Espen Ramnestedt, Head Chef at Smak (source: restaurant-smak.no)

TRADE

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TRADE AGREEMENTS

Under the framework of the European Economic Area (EEA), the **European Union** is Norway's largest trading partner. However, agriculture and fisheries are exempt from free circulation. Preferential trade in agricultural products between the EU and Norway is ruled by Article 19 of the EEA Agreement.

Norway negotiates free trade agreements with other countries through EEA and the European Free Trade Association (EFTA). Norway, **Iceland**, **Liechtenstein** and **Switzerland** have jointly concluded **30 FTAs** with about 40 countries and territories outside the EU, including: Egypt, the Gulf Cooperation Council, Israel, Jordan, Lebanon, Moldavia, Morocco, Palestinian Authority, Southern African Customs Union (SACU), Tunisia, **Canada**, Central American States, Chile, Colombia, Ecuador, Mexico, Peru, Hong Kong - China, Indonesia, Republic of Korea, Philippines, Singapore, Albania, Bosnia and Herzegovina, Georgia, North Macedonia, Montenegro, Serbia, Türkiye and Ukraine.
Norway has also bilateral free trade agreements with the **Faroe Islands** and **Greenland**. On 8 July 2021, the **United Kingdom** signed a free trade agreement with Norway, Iceland and Liechtenstein.

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TRADE BALANCE

FOOD EXPORT

$3.9 billions regionally (2021)

Norway exported 2.9 million tonnes of seafood in 2022, worth $14.3 billion. The country is the world's second largest exporter of seafood.

Fisheries and aquaculture is the largest export sector in Northern Norway, which accounts for ⅓ of national exports of fish products. Nordland county is the country's third largest exporter of marine fisheries and aquaculture. The blue sector comprises 95% total export in Nordland and 99% in Troms og Finnmark.

Norwegian agriculture is almost exclusively supplying the domestic market. The only export product of some significance been dairy products.

Most export to: EU (65% nationally, mainly to Sweden), United States and United Kingdom

FOOD IMPORT

$74.9 billion nationally (2019)

Norway is a net importer of most agro-food products except for fish. Over half of the meat consumed in Norway is imported. Fruits each account for around 10% of the total agricultural and food import value.

1. Processed food
2. Meat and dairy products
3. Fresh fruits and vegetables

Most import from: EU (66% nationally, especially from Sweden, Denmark and Netherlands) and Brazil

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In order to share information on progress and experience in implementing ecosystem-based ocean management in the Arctic, Norway will organise an international conference on ecosystem-based ocean management during its chairship (of the Arctic Council).

Norway's Chairship Arctic Council 2023-2025

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LOCAL FOOD

FOOD SECURITY & SELF-SUFFICIENCY

50% self-sufficiency in food and agricultural production, according to the Norwegian Agricultural Cooperatives.

Norwegian farmers produce **80-90 % of the national demand for beef and sheep meat**. The national market share for **grain and potatoes is approximately 60%**. Only **25% of the demand for vegetables, fruits and berries** is produced in Norway.

About **95% of the output of the Norwegian fishing industry** is **consumed abroad**.

Norway ranks **3 out of 113 countries in the latest Global Food Security Index**. Nevertheless, there are **socio-spatial disparities between Southern Norway and the Arctic regions** in terms of food insecurity.

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LOCAL AND INDIGENOUS ECONOMIES

The Sámi Parliament in Kárášjohka (source: sametinget.no)

Traditional Sami food include **fish**, **game**, **reindeer**, **berries**, and **herbs**. **Cloudberry and lingonberry** have been pivotal in local diet, since vegetables have been available all year round just recently.

In Norway, **reindeer harding is the livelihood of 2,600 to 2,900 people**. In the Sámi cosmology, the reindeer herd/*eallu* is based on good pasture conditions/ealát and is the foundation for the life/eallin.

The majority of reindeers are found in Finnmark (75%), while Troms and Nordland have approximately 6% and Trønderlag has 14%. However, contrary to popular belief, **fishing and picking berries** are usually the **main subsistence activities** of **most Sámi and local communities.**

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RESEARCH & POLICY

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RESEARCH AND POLICY

Food Hubs/Clusters

Marine Recycling Cluster
Arena Torsk/Cod Cluster
Ocean Autonomy Cluster
NCE Aquatec Cluster
NCE Blue Legasea
NCE Seafood Innovation
NCE Heidner Biocluster
ArcticHubs for fish farming
Nordlandsmat
Vesterålsmat
Lofotlam
Arktisk kje
ArktiskMat
Biotech North

Science and Education

Nofima
Træna Foodlab
NIBIO
FRAM High North Research Centre for Climate and the Environment
Centre for the Ocean and the Arctic
Uit-The Arctic University of Norway
NORD university
Norwegian University of Science and Technology
The Svalbard Global Seed Vault
Norwegian Centre for Organic Agriculture (NORSØK)

Dietary Guidelines

Norwegian Directorate of Health, The Norwegian Dietary Guidelines (2014)

Ministry of Health and Care Services, Norwegian National Action Plan for a Healthier Diet (2017)

Nordic Nutrition Recommendations (June 2023)

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EXAMPLES OF SUPPORT AND INVESTMENT

Several institutes provide grants for fostering R&D and innovation in the Norwegian food system. **NIBIO** is a project driven research institute and collects approximately **100 million NOK annually** in project funding from both national and international sources. Research organisations, companies and entities in the public sector can also apply for funding from the Research Council of Norway. For example, in August 2022, **the Research Council of Norway** announced a new funding programme to support the development of the country's cellular agriculture technology. The programme has an **annual budget of €2 million** and will run for five years from 2023. **Aquaculture Innovations** is currently developing a salmon farming project in northern Norway in Bronnoysund, Nordland. The project aims to build an area of approximately 500 acres in the Toft business area for the marine industry, which would be suitable for the soil cultivation of salmon and support the management of the entire value chain in the same area.

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EXAMPLES OF SUPPORT AND INVESTMENT

In late 2022, the Norwegian Government announced a proposal to introduce a 40% tax on aquaculture that would cover the production of salmon, trout, and rainbow trout, some of Norway's most lucrative exports. This tax, in place since January 1st, 2023. is designed to ensure that coastal communities receive more of the "value created by fish farming". It has been estimated that more than **€263 million are to be distributed to Norwegian coastal communities** from the government's aquaculture fund, covering a total of 142 municipalities and seven county municipalities.

About €2.7 billion in funding was provided by Norway under the EEA Grants during the period 2014–2021. Norway is also associated to **Horizon Europe**, the EU's ninth framework programme for research and innovation of €95.5 billion. This means Norwegian actors can apply for funding on equal footing with enterprises, public sector bodies and research institutions in EU member states.

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EXAMPLES OF SUPPORT AND INVESTMENT

According to the OECD, Norwegian farmers receive on average 59% of their revenue from agricultural support measures (PSE). This is the highest level across all OECD countries and more than three times higher than the OECD average. In contrast, the fisheries and forestry sectors are less reliant on trade protection and high government support. Government support is inter alia provided through the **Green Platform Initiative**, which was part of Norway's third package of financial measures launched in May 2020 in response to the coronavirus pandemic. The Government then granted **NOK 1 billion** over a period of three years to a green transition of the industrial sector. Under the "Green Platform" grant scheme, Finnfjord AS has received a **NOK 48 million grant** for its algae project. The company has been working on this for several years and is now in the process of being scaled up to industrial scale.

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Work to ensure that the maritime industry in the north becomes an important hub for sustainable blue growth in North Norway;

Promote increased value creation in the seafood industry in North Norway;

Improve resource control as a key component in sustainable management of fish stocks and to ensure equal conditions of competition in the fisheries sector;

Continue to give priority to marine research because research and knowledge are crucial for ensuring sustainable management of fisheries and other marine resources;

Prompt increased value creation in the agricultural sector in North Norway using production methods that are adapted to the natural conditions;

Promote the development of Sami industries, including ecologically, economically and culturally sustainable reindeer husbandry

The Norwegian Government's 2021 Arctic Policy

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TAKEAWAYS

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STRENGTHS OF NORTHERN NORWAY'S FOOD SYSTEM

A highly developed blue economy

A focus on innovation and R&D in the food system

Location with access to European markets and potential future easy access to Asian markets

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KEY AREAS FOR DEVELOPMENT

Continuing to work on closing the infrastructure gap

Public-private infrastructure investments are still needed in Northern Norway to fully develop local food systems. It is particularly essential for remote settlements (such as the Svalbard and the Lofoten) to build a coherent and reliable road network and storage facilities, and ensure more regular flight routes and broadland connection. Furthermore, the power supply must be strengthen to ensure reliable and renewable energy to the companies.

Increasing domestic vegetable and fruit production

Sustainable, low-carbon vegetable and fruit self-sufficiency in Northern Norway should be scaled up using the region's renewable resources for production and along the supply chain. This also requires providing increased support to small-scale vegetable and fruit producers.

Simplifying bureaucratic procedures

Strengthening local food systems is hindered by the complex procedures local producers have to go through in order to open a business, respecting health and safety standards, obtaining certifications, sell their products locally, and increase their customer base. Easier access to and/or training in such aspects should be provided to local companies.

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FINLAND

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NORTHERN FINLAND'S FOOD

Northern Finland covers the provinces of Northern Ostrobothnia, Kainuu, and Lapland and cover almost half of Finland's total area. The bioeconomy is the main regional sector, centered on forestry and bio-energy. The mining and industries are the second-largest employers.

Finland claims to be the world's northernmost agricultural country. The Arctic climate indeed produces a unique flora and fauna, which grow during and despite the eight seasons punctuating the Finnish Arctic's ecosystem. Moose, reindeer and other game have been herded and hunted for centuries. In addition, the numerous rivers and lakes of Northern Finland offer a rich array of fish, including salmon rivers and truite. Northern Finns also excel in making cheese. In Arctic forests and bogs grow bilberries, cloudberries, lingonberries, as well as mushrooms. Northern Finland is yet well connected to the rest of Europe and the world through a comprehensive network of roads between cities, towns and villages as well as airports in the major cities.

Reindeer meat has to awarded the title of the most emblematic food of Northern Finland. *Poronkäristys* is the traditional dish of Sámi people in Finland, Norway and Sweden, prepared by sautéing reindeer meat and served with lingonberries and mashed potatoes.

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A recent study found that Finnish berries contain large quantities of anthocyanin, whose consumption tends to correlate with health benefits including antimicrobial and antiviral properties. Anthocyanin might prove to be a crucial component in helping to treat viral infections, fever and neurodegenerative processes.

Petruskevicius et al., *Anthocyanin Accumulation in Berry Fruits and Their Antimicrobial and Antiviral Properties: An Overview*, Horticulturae, 2023

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OVERVIEW

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KEY FIGURES NORTHERN FINLAND

ECONOMY

Northern Ostrobothnia: **$16.5 billion** GDP/ **10.7%** unemployment
Kainuu: **$2.7 billion** GDP/ **11%** unemployment
Lapland: **$7.1 billion** GDP/ **11.4%** unemployment

In 2021, less than 10% of Finland's GDP and compared to a 10.4% unemployment rate nationally

PEOPLE

About 662,200 inhabitants - 12% of Finland (2022)
413,800 Northern Ostrobothnia/ 71,700 Kainuu/ 176,700 Lapland

10,500 identified as Sámi in Finland
About 35% live in or near their original Sámi homelands. Sámi people living in Lapland compose 5% of the national population

ENVIRONMENT

No Arctic coastline
BUT numerous lakes, rivers and swamps + Northern Ostrobothnia and Lapland have shoreline along the Gulf of Bothnia

⅓ of Finland is **above the Arctic Circle**, with **Lapland** representing **¼ of Finland**

ENERGY

Renewables make about **¼ of Finland's energy consumption**
18% hydropower and 9% windpower

Renewables represent **53% of Finland's electricity production**
23% hydropower and 12% windpower

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KEY SECTORS

Forestry

In Lapland, the forest sector accounts for a much larger percentage of the overall economic activity than in the rest of Finland.

Mining and Metal industry

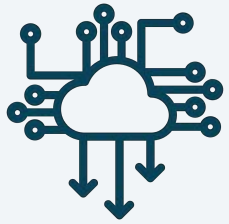
Finland is also the only European country that has deposits of all the minerals required to manufacture batteries.

Tourism

Northern Finland is a very popular winter destination, with winter skiing resorts and the Santa Claus village. 3.1 million overnight stays were registered in the region in 2019.

Energy

Finland has almost no fossil fuels but a well developed nuclear sector and numerous renewable energy sources (biofuels, peat, wood, hydro, wind).



ICT & Tech

The electronic industry contributes to 24% of the employment of the manufacturing industry in Northern Finland, especially in Oulu.

Maritime services

Finland offers its expertise in maritime technology, shipping and shipbuilding, and possesses 5 icebreakers, that are regularly lent to other countries.

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THE FOOD SECTOR

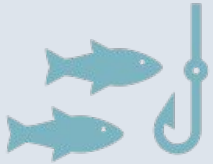
Finland's Food Sector in Short

The turnover of the food sector was €11.4 billion in 2019

It is the fourth largest industry, employing almost 40,000 people directly and 1 in 8 Finns indirectly, i.e. more than 340,000 people

There are about 1,600 food manufacturing enterprises in Finland. Most of them are microenterprises and ½ are in rural areas

FOOD ECONOMY



Blue Economy

The value of Finland's fish economy is estimated at about **$1 billion/year** (2021)

581,000 kg of fish cultivated in Ostrobothnia/ 4% of total fish production/ 5% of inland production

1 million kg of fish cultivated in Kainuu, exclusively **inland**/ 7% of total fish production/ 35% of inland production/ ⅛ of Finland's fish farming companies

477,000 kgs of fish are cultivated in Lapland, exclusively **inland**/ 3% of total fish production/ 16% of total inland production

Green Economy

Northern Ostrobothnia: **3,775 agricultural and horticultural enterprises** (9% total), mostly dairy farming and cereals (barley, oat), potatoes and carrot

Kainuu: **565 agricultural and horticultural enterprises** (1%,total), mostly dairy farming and plant production (hay, berries)

Lapland: **1,225 agricultural enterprises** (3% total) mostly dairy farming and plant production (hay, carrots, turnip, berries)

Service Economy

$6 billion Finnish Food Service Industry (2021)

43,787 Food Service Companies in Finland. Helsinki is the largest province with a 34% market share

Food processing companies are the **largest employers** of Finland's **food value chain**

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3 FOOD-RELATED FACTS

Finland is considered as the world's northernmost agricultural country since agriculture is the foundation of its food economy, based on potatoes and oat production. This distinguishes Finland from the other Arctic states, where fisheries represent the main food sector. Herring and rainbow trout are the most produced fish in Finland.

74% of Finland is classified as forest land. Only 9% is farmed, but this varies from 30% in the south-west to under 1% in Lapland. Finnish companies have been successful in brading the nutritional qualities of wild berries found in boreal forests. Lingonberries, strawberries or blueberries are often referred to as Finnish superfoods.

Northern Finland is the reindeer herding region. According to recent research, their meat is one of the healthiest you can found. It is especially lean and has high nutritional value, being rich in protein, B-12, omega-3 and omega-6, and minerals.

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THREE FOOD COMPANIES FROM NORTHERN FINLAND

HÄTÄLÄ • SINCE 1938

Finland’s leading fish producer, employing over 200 professionals with operations based in Oulu

Harmaalan hunajaa
Pohjoisen luonnosta

Wildflower honey producers, whose products have ranked as the second best honey in "Finland's Best Honey" competition

MINIMEIJERI

Kainuu-based dairy producer, making Kytön cheeses and other dairy products, as well as berry mustard, ketchup, jellies and sauces

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Finland entered 2023 with 9,044 restaurants and takeaway food businesses. 26 Finnish restaurants are in the Michelin Guide, 6 having been awarded one star. Palace Restaurant in Helsinki is the only 2-Starred Finnish restaurant.

No institution from Arctic Finland features on the Michelin Guide. Yet, Northern chefs are excelling in sublimating the high quality local ingredients. Sámi Chef Heikki Nikula, born and raised in Inari, was the head chef at the restaurant Anaar, awarded Restaurant of the Year 2020, where he specialised in marrying modern techniques, Inari's products and his Sami heritage.

Sámi Chef Heikki Nikula (source: visitfinland.com)

TRADE

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TRADE AGREEMENTS

Finland is part of the **European Union** since 1995 and was one of the first countries to join the Eurozone in 1999. As such, EU members are Finland's top trade partners.

Finland also have preferential trade in agricultural and fish products with **Norway**, **Iceland** and **Liechtenstein** under the Article 19 of the European Economic Area Agreement.

In addition, Finnish companies benefit from EU trade agreements with some 70 non-EU countries, representing nearly 32% of the EU's external trade. They include **Canada** (CETA), Central American states (**Honduras**, **Nicaragua**, **Panama**, **Costa Rica**, **El Salvador** and **Guatemala**), **Chile**, **Colombia**, **Peru**, **Ecuador**, the **Faroe Islands**, **Japan**, **Mexico**, **Singapore**, **South Korea**, the **United Kingdom**, **Vietnam**, **Switzerland**, and the **Western Balkans**.

Finland has finally trade relations with **Greenland**, which is an Overseas Country associated with the EU and engaged in a fisheries partnership with the EU since 2015.

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TRADE BALANCE

FOOD EXPORT

$2.3 billions nationally (2022)

Finland exported 79 million kgs of fish and fish products in 2021, with a value of $202 million. It comprises 10% of total exports. Most important export products are fresh whole salmon and rainbow trout, frozen herring and roe and roe products. Fish products are largely destined for domestically consumption.

The value of exports of Finland's agricultural products and foodstuffs in 2021 was about $2.0 billion. Dairy and dairy products are the primary food export, comprises (23%), followed by cereal and cereal products (11%) and meat, eggs, and live animals (11% each).

Most export to: EU members (Sweden, Estonia, France, Germany) and China

FOOD IMPORT

$6.0 billion nationally (2021)

Finland's imports of agri-food products is almost three times higher than the value of food exports. 83 million kgs of fish products were imported to Finland in 2022, with a value of $503 million. The majority of the fish consumed in Finland is imported.

1. Processed food
2. Seafood products
3. Fruits and vegetables

Most import from: EU members (Netherlands, Sweden, Norway, Germany)

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One job in the food industry creates more than three other jobs in Finland. The domestic content of raw materials in Finland is very high (82%) and approximately 72% of the value added of food exports remains in Finland.

Business Finland

LOCAL FOOD

FOOD SECURITY & SELF-SUFFICIENCY

Finland ranks **1st out of 113 countries** in the latest **Global Food Security Index**, considering the issues of food affordability, availability, quality, safety, and natural resources and resilience.

A nearly **80% self-sufficiency**, with 80% in beef, 95-100% in pork, almost 100% in dairy products, 100% in bread cereals. It should however be stressed that Finnish agriculture is **dependent on various production inputs**, such as fertilizers, fuel, feed proteins and machinery.

Today, it is estimated that **only ⅛ of all wild fish species are harvested in Finland**. Yet about 90% of Finns declare to eat fish on a regular basis and Finland imports approximately four times more fish products than it exports.

There are **socio-spatial disparities between Southern Finland and the Arctic regions** in terms of food insecurity.

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LOCAL AND INDIGENOUS ECONOMIES

SÁMEDIGGI
SÄMITIGGE
SÄÄ'MTE'ĞĞ
SAAMELAISKÄRÄJÄT

Profiling Indigenous Food Systems

TRADITIONAL FOOD SYSTEM OF THE INARI SÁMI PEOPLE IN FINLAND

Source: Profiling Indigenous Food Systems, the Sámi Parliament in Finland in collaboration with The Food and Agriculture Organization of the United Nations (FAO)

In Finland, **public access rights** refer to the right of everyone to enjoy outdoor pursuits regardless of who owns or occupies an area. There is no need to obtain the landowner's permission, and there is no charge to pick wild berries, mushrooms and flowers, or to fish with a rod and line, or through a hole in the ice. Other types of fishing nevertheless require a fishing license.

The traditional Sámi food system is based on fishing, hunting and wild plants gathering. It is estimated that the Inari Sámi people generate 75% of the protein they consume through fishing, hunting and herding. **Reindeer and fish** are the most important sources of proteins. **Reindeer husbandry area covers 36% of the entire surface of Finland**, spreading out across the provinces of Lapland and Oulu.

Wild berries, such as lingonberries and cloudberries, are an important source of vitamins and minerals.

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RESEARCH & POLICY

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RESEARCH AND POLICY

Food Hubs/Clusters

Arctic Food Lab - Oulu2026
Arctic Smart Rural Community Cluster - ProAgria Lapland
Circular Economy Center Kemi

Science and Education

Natural Resources Institute Finland/Luke
University of Eastern Finland
Finnish Meteorological Institute
SUSFOOD2
Lapland University of Applied Sciences
Sámi Education Institute (SAKK)
Lapin yliopisto - the University of Lapland
Kajaani University of Applied Sciences
University of Oulu
Oulu University of Applied Sciences

Dietary Guidelines

National Nutrition Council, Finnish nutrition recommendations (2014)

Nordic Nutrition Recommendations (June 2023)

EXAMPLES OF SUPPORT AND INVESTMENT

Finland's support system for the food sector consists of fully EU-funded direct payments, partly EU-funded support paid through the Rural Development Programme and fully nationally funded support.

As a EU member, the Finnish agricultural support system is based on the EU CAP scheme. In 2021, the European Commission has approved Finland's **CAP Strategic Plan for 2023–2027**. Since 2015, Finland's national aid system consists of two main elements: national aid for farmers in Southern Finland and **Nordic aid**. The latter is specifically designed to foster agricultural production in the northern parts of the country covering: milk production aid, livestock, greenhouse production, storage of horticultural products, wild berries and mushrooms, as well as headage-based reindeer husbandry aid. In 2021, the total amount of Nordic aid was close to **$325 million**. The most significant individual forms of support are the Nordic milk production aid ($176 million) and Nordic livestock headage aid ($86 million).

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EXAMPLES OF SUPPORT AND INVESTMENT

In addition, following the adoption of the Partnership Agreement 2021-2027 with Finland, the European Commission has adopted the **European Maritime, Fisheries and Aquaculture Fund (EMFAF)** Programme for Finland, to implement the EU common fisheries policy (CFP) and EU policy priorities outlined in the European Green Deal. The total financial allocation for the Finnish programme 2021-2027 is **$154 million** over the next six years, of which the EU contribution accounts for $78.8 million. The fund is designed to *"support the availability of domestic fish and the development of small-scale fishing activities; research and innovation to improve efficiency and digitalisation across the entire value chain; and the protection of biodiversity and the state of fish stocks"*. One of the targets is to double Finnish aquaculture production by 2030, in line with the EU aquaculture 2021-2030 strategic guidelines.

Finnish enterprises and organizations can also fundraise to promote their activities. For example, in 2022, Espoo-based agritech startup **Arctic Farming collected $165,000** in a seed round to invest in R&D as well as to introduce their technology to the market. Arctic Farming has developed a new vertical farming solution enabling hyperlocal production of fresh herbs and leafy greens regardless of the time of year, or their geographical location, and significantly reducing global food waste in the process.

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Promoting Arctic food security in a changing climate by safeguarding the preconditions for local industries, in particular reindeer husbandry and other traditional livelihoods.

Continuing the use of and developing cooperation mechanisms for the management and use of natural resources and protected areas together with the Sámi following the guidelines based on the Akwé:Kon operating model of the UN Convention on Biological Diversity.

Strengthening the preparedness of industries based on natural resources (forestry, agriculture, fisheries, game management and reindeer husbandry) for disaster risks and developing risk monitoring, including monitoring and early warning systems for forest fires, diseases and pests.

2021 Finland's Strategy for Arctic Policy

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TAKEAWAYS

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STRENGTHS OF NORTHERN FINLAND'S FOOD SYSTEM

An expertise in nature-based solutions and the Arctic

Access to the EU funding system and to the single market

Fairly advanced communication infrastructure above the Arctic Circle

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KEY AREAS FOR DEVELOPMENT

Advancing agroforestry and new forms of aquaculture

Finland's large forest cover and rich surface waters offer a suitable ecosystem for advancing agroforestry. This land-management system combining woody perennials, crops and animal farming. has the merit of killing two birds with one stone by both strengthening food self-sufficiency as well as supporting environmental conservation.

Continuing infrastructure development

Private-public partnership should continue to focus on tackling the accessibility issue in the Arctic region through investing in infrastructure and logistics. Sustainable regional development requires transportation routes but also low-emission methods and modes of transport as well as storage facilities. Efforts should concomitantly be made to promote the digitalisation of food systems.

Nurturing Northern Finland's food culture

The Arctic Food Lab in the the Oulu2026 region should serve a model to promote local and Indigenous cuisine and foodways in Northern Finland through networking, social media presence, and event organization. This strategy could also attract Michelin Guide and other institutions for Arctic Chefs to finally receive the recognition they deserve.

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SWEDEN

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NORTHERN SWEDEN'S FOOD

Northern Sweden is made up of the counties of Norrbotten and Västerbotten, which together form the Upper Norrland region. Mining is the main industrial sector, and Sweden is the European Union's largest mining nation. The Västerbotten economy is more diversified than in Norrbotten, where mining holds an important share of the economy. Nonetheless, government and public institutions remain the largest employer in both counties.

The traditional food system of Arctic Sweden revolves around the resources that could be found in the nearby environment. Reindeer, elk and birds (such as ptarmigan and wood grouse) from the forest, fish like grayling, salmon, trout, Arctic char and whitefish from the water, and berries, roots and other edible plants from the soil. Due to the climate conditions, most food were historically dried, smoked and/or salted so as to secure the food supply during the four seasons. Many of Swedish traditional foodways stem from this need to store and use ingredients all year round. Swedish food has been described by Jamie Oliver as bing the food as *"big, bold, brave and definitely up there with the best in the world"*.

As across ancestral Sámi land in Northern Europe, reindeer meat is a staple food in Northern Sweden. So is Elk meat. *Renskav* is a traditional Sami dish in which thin slices of frozen reindeer meat are fried in a pan with wild mushrooms.

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Researchers have recently examined the possibility of increasing Northern Sweden's degree of self-sufficiency in food supply by using a data center as a heating source for greenhouse production. The conclusion is that up to 7.6% of the vegetable need of northern Sweden could be produced using data center heated greenhouses, whose cost prices is even lower than similar typical greenhouse businesses.

Ljungqvist et al., *Data center heated greenhouses, a matter for enhanced food self-sufficiency in sub-arctic regions*, Energy, 2021

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OVERVIEW

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KEY FIGURES NORTHERN SWEDEN

ECONOMY

Upper Norrland: ***€25 billion*** *GDP/****5%*** *GDP*
Västerbotten: **€14 billion** GDP/ **5.0%** unemployment
Norrbotten: **€11 billion** GDP/ **5.6%** unemployment

In 2021, Upper Norrland had the third-highest level of GDP per capita across the 8 Swedish regions. Upper Norrland's unemployment was also lower than the 7.2% rate nationally.

PEOPLE

About 524,000 inhabitants - 5% of Sweden (2021)
274,563 Västerbotten/ 249,693 Norrbotten

17,000 to 20,000 identified as Sámi
There are 51 Sámi villages across Sweden. The Sámi Parliament of Sweden is based in Kiruna, Norrbotten County.

ENVIRONMENT

No Arctic coastline
BUT the Swedish Lapland has a coastline of over 1,500 kms on the Gulf of Bothnia, 30,000 lakes, and all four national rivers.

Upper Norrland encompasses about **⅓ of Sweden**, which **15% of land area** is situated **north of the Arctic Circle**

ENERGY

Upper Norrland accounts for only **9% of national energy use**

Upper Norrland accounts for 21% of Sweden's electricity production
Sweden's larger producing region with 100% renewables, mainly hydro- and wind power

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KEY SECTORS

Public sector

Public administration, defence, education, human health and social work activities constitute the largest employers in Upper Norrland.

Mining

Upper Norrland concentrates 9 of the 12 active mines in Sweden, focused on copper, iron ore and gold. Mining accounts for 7.5% of the northern economy.

Steel industry

Steel production is one of the main industries in Northern Sweden. It is estimated that investments in green steel will bring up to 10 000 new jobs in the region.

Forestry

Forest cover 75% of Västerbotten and 60% of Norrbotten, hence forestry is an important economic sector in the region.

Tourism

Tourism is the fastest growing sector in Northern Sweden's economy, with nearly €1 billion value added in 2021.

Energy

Energy production is a backbone of the regional economy, based on bioresources including timber and hydropower.

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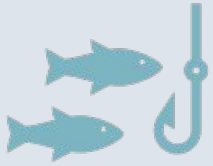
THE FOOD SECTOR

Sweden's Food Sector in Short

The food industry is Sweden's third largest sector in terms of production value and number of employees

Agriculture, forestry and fishing account for 4,0% of value added in Västerbotten, and 2,6% in Norrbotten

FOOD ECONOMY



Blue Economy

Approximately **153,000 tons of fish were caught** in Sweden in 2021. The total value of landings was worth **€67.6 million**

In 2021, Sweden's aquaculture production was estimated at **11,900 tons** with a total value of **€47.6 million**. Rainbow trout corresponds to almost 90% of production

The fishing industry of Northern Sweden is chiefly based on **aquaculture and fish farming**. Between **50 and 70% of the total salmon quota** in Sweden is fished along the coast in **Norrbotten**

Green Economy

15% of Sweden's agricultural land is **pastures**, the rest being cropland. The agriculture industry employs about **2% of total workforce**. The largest sectors are beef and dairy products. **Over 50% of farms have animal production**, of which ⅓ is dedicated to **dairy farming**

Upper Norrland's farming system consists essentially of **small, low productivity farm holdings**. In Norrbotten, only **1%** of land is **dedicated to agriculture**. Crop production mostly consists of forage, coarse grains and potatoes

Service Economy

€10.4 billion Swedish Food Service sector (2021)

Sweden's food and beverage industry is comprised of approximately **4,000 registered companies**

Accomodation and food services represent **2,1% of value added** of **Västerbotten,** and **Norrbotten** in 2021

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3 FOOD-RELATED FACTS

Over 70% of the Swedish territory is covered by forests and Sweden is the country with the most moose per square kilometer in the World. The moose population ranges from about 300,000 individuals during winter to more than 400,000 after the whelping season.

The right of public access to the land is a customary law in Sweden. It means that everyone can roam and enjoy the ecosystems, or pick wild berries and mushrooms, under the rule "don't disturb, don't destroy". However, the Right of Public Access does not cover hunting and fishing. Swedish citizens always need a licence, except for fishing in public waters.

The Swedish Lapland is known for Kalix Löjrom, a caviar from the world's smallest salmonid living in Norrbotten archipelago, in the North parts of the Gulf of Bothnia, along the . It became Sweden's first food product to receive a protected designation of origin by the EU.

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THREE FOOD COMPANIES FROM NORTHERN SWEDEN

Luleå-based startup focused on finding solutions for energy and resource-efficient cultivations all year round in arctic and subarctic climates

Dairy farm located in Svedjan, in Swedish Lapland, producing milk and proposing 5 artisan cheese products

Jakobgården

Small farm in Överkalix, Boheden, raising the ancient Swedish sheep breed “finullsfår” for meat, wool, leather and wool crafts production

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No less than 67 restaurants are recommended in the Michelin Guide. 15 of them have been awarded one-Michelin star and 2 institutions hold two-stars - Vollmers and Aloë. Three-starred Frantzén, in Stockholm, figures in the World's 50 Best Restaurants list.

Yet again, the Arctic region seems to have been forgotten by the Michelin Guide's inspectors. Yet again, Northern Chefs have nothing to be ashamed of. Mathias Dahlgren - the first Swedish chef to win the Bocuse d'Or back in 1997, and who was named 'Chef of Chefs' five times - was born and raised in Storliden outside Umeå in Västerbotten.

Chef Mathias Dahlgren (source: bocusedor-winners.com)

TRADE

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TRADE AGREEMENTS

Sweden became a member of the **European Union** in 1995. As such, other EU countries are Sweden's top trade partners.

Based on the agreements negotiated by the EU, Swedish companies can trade with some 70 non-EU countries, representing nearly 32% of the EU's external trade. These include **Canada** (CETA), Central American states (**Honduras**, **Nicaragua**, **Panama**, **Costa Rica**, **El Salvador** and **Guatemala**), **Chile**, **Colombia**, **Peru**, **Ecuador**, the **Faroe Islands**, **Japan**, **Mexico**, **Singapore**, **South Korea**, the **United Kingdom**, **Vietnam**, **Switzerland**, and the **Western Balkans**.

In addition, the Article 19 of the European Economic Area Agreement entails that Sweden have preferential trade with **Norway**, **Iceland** and **Liechtenstein** regarding agricultural and fish products.

Greenland is finally one of Sweden trading partners as an Overseas Country associated with the EU and engaged in a fisheries partnership with the EU since 2015.

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TRADE BALANCE

FOOD EXPORT

$12 billions nationally (2022)

Seafood products comprises 42% of Sweden's export value, lead by dried, salted and smoked fish. However, fishing and aquaculture export do not bear the same weight in Upper Norrland's economy.

The largest export category, in terms of value and quantity, is dairy products, especially powdered milk. Processed agricultural products represent 1/3 of total agricultural exports.

Most export to: EU members (75%, especially Denmark, Germany, Finland) and Norway (20%)

FOOD IMPORT

$19 billion nationally (2022)

Sweden is a net importer of food and agricultural products. The country imports almost twice as much food products as it exports in terms of quantity.

1. Seafood products
2. Fruits and vegetables
3. Meat products

Most import from: EU members (60%, especially Netherlands, Denmark, Germany and Spain)

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The growth of the tourism industry in Northern Sweden is opening up the potential of duodji and food production which have long been an important part of Sami culture. There is a growing demand for high quality and ecological food products worldwide for which Sami food products are well suited. [...] There is potential to grow th(e) sector [of Sami food entrepreneurs] further, which is quite limited at the moment.

Business Finland

LOCAL FOOD

FOOD SECURITY & SELF-SUFFICIENCY

Sweden's food self-sufficiency is estimated at 50% by the Federation of Swedish Farmers. The capacity to supply food was around 75% in the early 1990s.

Carrots, **sugar**, **cereals**, and **eggs** are the only foodstuffs for which Sweden is self-sufficient, with meat and dairy products (75% self-sufficiency) to a lesser extent.

Arctic Sweden imports 91% of all fresh fruits and vegetables, mostly by air. From becoming self-sufficient, the vegetable production of northern Sweden would have to reach 11.5 kilotons per year.

90 % of the Swedish food production is concentrated in the southern part of the country, illustrating the profound **socio-spatial disparities** in terms of food insecurity.

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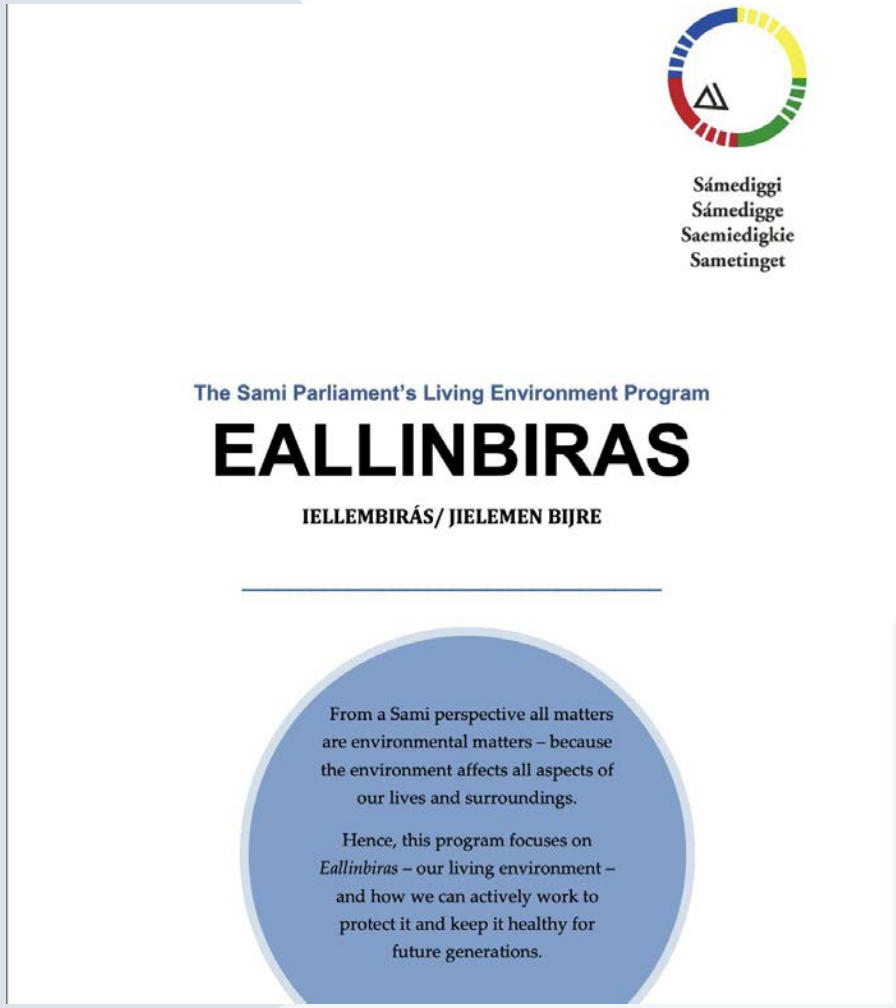
LOCAL AND INDIGENOUS ECONOMIES



Source: Reindeer policy and food programme, the Sami Parliament of Sweden

The value and number of persons involved in subsistence fishing and hunting, alongside with small-scale farming and berry picking, are difficult to estimate. **Local food systems are not entirely a monetary economy** but also bear **social and cultural significance**.

The reindeer herding area covers nearly **40% of Sweden's surface**, from Idre Sameby in the South, to Könkämää Sameby up North. Under Reindeer Husbandry Act of 1971, only members of a Sami community have the right to herd reindeers. **Around 2.500 people are directly depending on incomes from reindeer herding**.

In 2021, Sweden's top judges conferred **exclusive fishing and small game hunting rights** to a group of Sámi reindeer herders of the village of Girjas Sameby. This ruling, following a 30-year juridic battle, is an important cornerstone for the Sami People's rights to subsistence hunting and fishing.

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RESEARCH & POLICY

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RESEARCH AND POLICY

Food Hubs/Clusters

Scandinavian sustainable food festival
Stars du Nord
Arctic Artisan Food House
BSR Food cluster network
VÄRT
Slow Food Sapmi

Science and Education

Luleå University of Technology
Umeå Universitet
Sweden's Agricultural University
Sweden Foodtech
Research Hub Sweden

Dietary Guidelines

Swedish National Food Agency Swedish dietary guidelines: Healthy and sustainable diets (2015)

Nordic Nutrition Recommendations (June 2023)

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EXAMPLES OF SUPPORT AND INVESTMENT

Sweden's support system for the food sector consists of fully EU-funded direct payments, partly EU-funded support paid through the Rural Development Programme and fully nationally funded support.

As a EU member, the Swedish agricultural support system is based on the EU CAP scheme. In 2021, the European Commission has approved **Sweden's CAP Strategic Plan 2023-2027**. This national aid system consists of approximately **$3.7 billion available for direct payments** and **$1.1 billion for European Agricultural Fund for Rural Development funds**. A total of **$883 million** are especially to be paid to farmers to promote the continuation of sustainable agricultural practices in areas where conditions for farming are poor, such as mountains, forest-dominated areas or northern areas. As demand for plant-based foods grows, the government, through **Sweden's Innovation Agency**, has also invested **$2.7 million** into 17 agricultural projects which will improve the self-sufficiency of the county and meet the needs of a population consuming more and more plant-based products. Sweden has also special exemptions under the EU scheme to provide national support in order to secure the preconditions for agricultural production in the northern parts of the country.

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EXAMPLES OF SUPPORT AND INVESTMENT

In addition, following the adoption of **EU's $2.4 billion Partnership Agreement 2021-2027 with Sweden**, the European Commission has adopted the **European Maritime, Fisheries and Aquaculture Fund** (EMFAF) Programme for Sweden, to support long-term sustainable development of the fisheries, aquaculture and fish processing sectors through innovation, investments and creation of marine protected areas. The total financial allocation for the Swedish Programme 2021-2027 is **$254 million** over the next six years, of which the EU contribution amounts $127 million. 21% of the total EMFAF allocation is dedicated to sustainable fisheries and environmental measures, 12% invested in sustainable aquaculture and 6% in processing and marketing. Sweden is boosting the EMFAF share for aquaculture with **$60.5 million of national co-financing**.

In late 2022, the European Investment Bank (EIB) has agreed to a **$50 million venture debt investment** in the company RE:OCEAN, with the aim of developing Sweden's first commercial and large-scale, land-based salmon farm in Säffle, Värmland, employing cutting-edge zero-water circulation technology. Today, nearly all of Sweden's salmon is currently imported. The investment would increase Sweden's food and protein self-sufficiency by locally producing 1 out of 5 domestically consumed salmon.

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2.5 Sustainable economic development and business sector interests: Proactive work to address technical trade barriers and to promote greater border trade are [...] vital for economic development in the Arctic. [...] Work for [...] the sustainable management of fisheries in the Arctic region.

2.6 Ensuring good living conditions: Smart solutions and the development of robust infrastructure, including digital infrastructure, to create attractive communities in the Arctic region. [...] Work for a living Sami culture based on long-term sustainable reindeer husbandry and other Sami livelihoods.

2020 Sweden's strategy for the Arctic region

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TAKEAWAYS

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STRENGTHS OF NORTHERN SWEDEN'S FOOD SYSTEM

Leading expertise in sustainability and climate smart-tech

Access to the EU funding system and to the single market

Available renewable resources and strong local traditions

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KEY AREAS FOR DEVELOPMENT

Developing food tourism

The tourism sector holds considerable potential to create new jobs and boost local economies in rural and geographically remote areas of Sweden's Arctic. The sociocultural meaning of food systems to local and Indigenous communities offer an organic venue to development slow, sustainable forms of tourism.

Continuing to invest in logistical development

Infrastructure development is key in building socially profitable and environmentally respectful food systems. The intrinsic benefits of public-private partnerships can never be stressed enough. Increasing efforts should inter alia be placed on processing facilities and low-carbon road and sea transports to replace air delivery, which is neither reliable nor environmentally sound.

Improving coordination between actors and sectors

More food-oriented clusters or hubs should be created in Northern Sweden, in order to increase coordination between the different stakeholders of the supply chain. This requires further investment in multi-purpose facilities regrouping R&D, production, processing and transport. Fair access should be ensured for small-scale enterprises, including Sámi businesses, to share their knowledge and express their concerns and needs.

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RECOMMENDATIONS

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I	TRADE FACILITATION	• Incentivizing local food production and consumption • Digitalizing trade procedures • Creating a PGI for Arctic food products
II	CONNECTIVITY & INFRASTRUCTURE	• Increasing logistic capabilities/infrastructure capacities • Fostering the transition to green shipping • Connecting producers and consumers
III	ECONOMIC DIVERSIFICATION	• Striving for full, meaningful utilization of food sources • Stimulating innovative solutions to food challenges • Banking on food tourism for local development
IV	PARTNERSHIP	• Retaining and attracting qualified labor • Deepening multi-stakeholder partnerships • Monitoring food economies

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I. TRADE FACILITATION

Challenges

Regulatory and administrative hurdles at the local level, among Arctic territories, and between Arctic and non-Arctic actors.

These barriers are preventing Arctic food industries from fully unlocking their potential for **sustainable economic development** and **nutrition security**.

Why?

***Too strict legislation*:** food legislations that are not adapted to the socio-environmental context where they apply oftentimes prohibit or severely restrict the potential of local food systems for food security and economic development.

***Disparate standards*:** uneven regulations and food safety standards among Arctic and non-Arctic states are limiting pan-Arctic cooperation on food security and hindering export opportunities for Arctic food products.

***Unfair competition*:** local products are facing unfair competition from cheaper imported goods. Conversely export tariffs on food products affect the profitability of local food-producing companies.

What to do?

Building a **tax and legal framework supporting the scaling-up and scaling-out of the Arctic food sector**.

Local food systems are a vector for **self-sufficiency**, **food security** and **sustainable economic development**. The goal is also to help feed a growing global population in a sustainable manner.

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I. TRADE FACILITATION

Incentivizing local food production and consumption

Enhancing food access and affordability through scaling-up of local food production and consumption

National and local governments should provide **economic incentives** tailored to stimulate the domestic market in the Arctic and ensure access to a culturally appropriate food environment. This demands **supply-side interventions** lowering VAT on Arctic food products as well as **modernizing tax structures** to incentivize private entities and venture capital firms to invest in local businesses and hence stimulate the local economy. The creation of **equipment rental programs** should also be considered to lower production costs. In addition to being more easily available in local stores, **local and Indigenous foods** should also be **financially accessible**. **Consumer-oriented programs**, based on food subsidies (e.g. fresh-food vouchers, in-kind transfers) and/or support to food banks, could be created toward this end. The idea is to ensure the cost of producing and consuming food locally is actually lower than the costs of imported food. More financial and human resources should as well be devoted to **school food programs**, that both guarantee students have access to nutritious local food and raise their awareness on this issue. Furthermore, public authorities should regularly **survey citizens for solutions on administrative or statutory changes** to simplify starting a business or getting products into the market. Finally, policy measures should be taken to **support wild harvest of traditional subsistence foods** and increase the ability to trade them.

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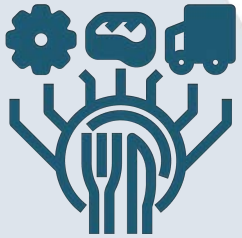
I. TRADE FACILITATION



Digitalizing trade procedures

Helping local businesses navigate the competitive food retail market

AEC believes food producers in the Arctic hold the solutions not only to local food security but also to feed a growing population with nutritious, high-quality foods. **Digital technologies** are to play a key role in scaling up and scaling out Arctic food industries. **Economic and legal consulting services** (i.e. training programs and workshops) could be proposed by governments, consulting companies and/or large food companies to small and medium-scale businesses. The objective is to help them **navigate bureaucratic paperwork** so as to **enhance their ability to access markets** by supporting literacy in trade procedures, obtaining specific certifications and permits for shipment, and meeting regulations. **Equitable dialogue between producers and institutions** would concomitantly be fostered through this process. Moreover, **electronic trading platforms** should also be created to simplify the steps to connect producers, hauliers, retailers and buyers. Last but certainly not least, AEC wants to reiterate that new Arctic and non-Arctic members are always welcome to join our platform and resources.

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I. TRADE FACILITATION

Creating a PGI for Arctic food products

Increasing local food production and value adding while incentivizing good practices through niche products and storytelling

AEC is calling Arctic states and food industry representatives to jointly develop a state-subsidized **"protected geographical indication" (PGI) to include the Arctic**. This regional certification system should be a **collaborative initiative** between governments, Arctic regional organizations, food producers, and Indigenous Peoples' organizations. The objective is to **improve traceability** and **incentive good practices** among food producers, including biggest companies, by providing clear guidelines for them to comply with regarding the **origin, quality and sustainability** of products labeled as "Arctic". In addition, such PGI would **promote pan-Arctic exchanges** through making sure products meet a list of common food safety, environmental and ethical standards agreed upon by Arctic states. Finally, an Arctic PGI would create a niche market for premium quality Arctic products which, in turn, would help local producers **diversify their customer base** by building trust in food quality and ethics. **Special provisions for indigenous foods** should be included to uplift the commercial sale of traditional and indigenous foods. Food is the centerpiece of the economic and social life of every human society. AEC believes food can be the vector to sustainably connect the Arctic to the world while respecting the environment and the peoples. As the United Nations estimates, the world could easily be fed if just 2% of oceans were to be sustainable farmed.

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II. CONNECTIVITY & INFRASTRUCTURE

Challenges

A fragmented Arctic food supply chain characterized by **logistical and operational barriers** between producers and customers.

This results in a **limited or circumscribed distribution of local production** with widespread food shortages, a lack of access to international markets, as well as a high cost and unreliable distribution of imported products.

Why?

***Transportation gap*:** unreliable transportation networks, with uneven road segments, expensive air transport and unreliable shipping corridors, as well as safety risks associated with the harsh and unpredictable Arctic conditions.

***Inadequate/missing infrastructures*:** a lack of trade and logistic centers and inadequate storage facilities for food products.

***Patchy communication network*:** incomplete and/or unreliable broadland and satellite coverage. Arctic areas are also more susceptible to outages due to rough weather and the climatic conditions.

What to do?

Bridging the connectivity gap to reduce the physical and cost-related barriers to the distribution capacity of food products within and between Arctic territories, as well as with the non-Arctic.

The goal is to **cement the stability pillar of Arctic food security** to make sure households have access to adequate food at all times while offering communities export-related opportunities.

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II. CONNECTIVITY & INFRASTRUCTURE

Increasing logistic capabilities and infrastructure capacities

Safeguarding the access and availability pillar of food security in the Arctic and preventing food shortage to the extent possible

According to Guggenheim Partners, the Arctic needs $1 trillion worth of investments in infrastructure. Bulletproofing Arctic food systems for tackling food insecurity through local production and sizing export opportunities *inter alia* require: the **rehabilitation of existing roads**, the **modernization/ expansion of existing harbors and airports** (with a runway of at least 1,800m), the **construction of new road sections, cargo service airports and ports**, the **creation of multimodal transportation hubs,** as well as building **facilities for processing, packaging, selling, and storing** food products. **Temperature-controlled storage warehouses** are particularly needed to improve access to fresh foods in rural settlements. **Public-private partnerships** are a viable strategy to overcome economic barriers associated with setting up such a congruent transportation network. Along with government programs, policy makers should also **reduce tax burdens and/or provide tax credits** to private companies interested in investing in bridging the regional connectivity gap. These incentives are designed to encourage private investments in infrastructure development.

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II. CONNECTIVITY & INFRASTRUCTURE

Fostering the transition to green shipping

Mitigating climate-related risks to increase navigation safety, reliability and efficiency

Maritime transportation is arguably the most sustainable and cost-effective vector for importing to and exporting from the Arctic. **Green hydrogen** might be an alternative to fossil fuels in the marine and aviation sectors, reducing the cost of imported food and stimulating the export economy. Public support should be specifically provided to research and innovation in the energy field to **mainstream low-cost, context-relevant renewable sources** in Arctic communities. Furthermore, **navigation safety and reliability** have to be significantly reinforced through mapping shipping routes and providing access to real-time information regarding weather and ice conditions. Public institutions and private companies should jointly invest in **hydro-meteorological and navigation infrastructures**. AEC also strongly encourages Arctic governments to cooperate in setting up a **coherent satellite network** for the region. It should also be noted that actively minimizing the uncertainty associated with polar navigation through data compilation is key in **reducing the cost of marine insurance**. Affordable maritime insurance markets would then promote economic development in the Arctic by encouraging entrepreneurial industries.

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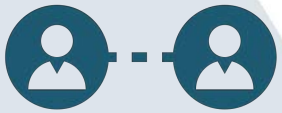
II. CONNECTIVITY & INFRASTRUCTURE



Connecting producers and consumers

Drawing on digital technologies to bypass the physical obstacles between producers and consumers

Public-private partnerships should be created and/or reinforced to promote the **rapid deployment of a variety of broadband technologies** and hence expand **access to internet/cell coverage**. Of these technologies, the most reliable for the Arctic is **optical fiber**. Digital technologies are to play a critical role in supporting (1) **marketing**, producers having more visibility to promote their products to a wider audience, and (2) **distribution and dispatch**, producers being able to sell their products online. Widespread broadland coverage is instrumenting in **networking Arctic food systems with each other and with the non-Arctic**, for example with Asian markets. Inclusive digitalization will bring **added value to products**, as well as **reduce storage and transport costs** and **improve waste management**. Moreover, online marketing can help small food producers **sensitize consumers** to unconventional, yet valuable, Arctic products, and tackle misinformation regarding traditional foods. Finally, digitalization can support **nutrition education and behavior change communication** by **nurturing greater consumer knowledge** on Arctic food systems. The idea is to promote care practices and feeding patterns that meet the dietary needs of Arctic communities.

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Arctic Connectivity Working Group 2021

If you want to dig deeper into why and how improved connectivity is key in facilitating sustainable economic development for the people and businesses in the Arctic, please check out the AEC Connectivity Working Group's Report: Connectivity Infrastructure in the Arctic (2021).

You will find there the "Arctic Connectivity Sustainability Matrix", intended to help you understand and navigate the multitude of funding vehicles available to strengthen connectivity and infrastructure in the Arctic.

III. ECONOMIC DIVERSIFICATION

Challenges

Food loss and waste are a **socio-environmental non-sense**, resulting in an unwarranted economic shortfall for all actors along food supply chains.

Moreover, Arctic nations have **not fully tapped the potential of the food sector yet**, either in terms of meeting local food needs or for providing communities with development opportunities.

Why?

***Economic specialization*:** The pivotal significance of the blue economy is coupled with a reliance on imports for other food needs as well as with an increased vulnerability to price fluctuations, weather hazards and environmental changes.

***Misconception that nothing could be sustainability grown in the Arctic*:** agriculture and horticulture are still underdeveloped sectors and remain perceived as marginal, if not impossible, due to mostly inhospitable climate conditions.

***A focus on raw materials*:** much attention is given to petroleum, mineral resources and raw materials, and not to food production, for developing Arctic economies.

What to do?

Strengthening the role of the food sector in Arctic economies and livelihoods through **diversifying products, production methods** and **food-related economic activities**, as well as **supporting indigenous foodways**.

The goal is to **achieve full, meaningful utilization of foods** to **reduce waste and multiply income** opportunities for local communities.

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III. ECONOMIC DIVERSIFICATION

Striving for full, meaningful utilization of food sources

Strengthening local economies through the valorization of underutilized products, by-products and food waste

Government and financial institutions should develop action plans tailored to **support the diversification of food economies.** Certain food production should be integrated as part of government **climate strategies**. For instance, seaweed farming is not only a new source of income for local populations but also buffers ocean acidification and deoxygenation. If Arctic agriculture should definitely be developed to increase nutrition and food security, it also offers the advantage of requiring low to no use of pesticides and herbicides. Diversifying food economies implies **expanding the scope of projects eligible for state permitting and grant funding** to include unconventional food products and underdeveloped activities, among which through actively supporting the development of indigenous technological and manufacturing capacity. Efforts should be devoted to **minimize investment risks and increase return investment for small-scale producers**. **Access to credit and loans** for SMEs should be facilitated through mechanisms such as loan guarantees, microcredits, and business angels. These initiatives should be coupled with **financial education interventions** aimed at overcoming skills barriers in access to finance. In addition, **marketing training** should be provided to local companies so as increase their ability to reach new customers, for example through making it smoother accessing public service advertising.

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III. ECONOMIC DIVERSIFICATION

Stimulating innovative solutions to Arctic food challenges

Investing in food innovation to boost food self-sufficiency

Food innovation should supplement, rather than replace, subsistence economies. **Controlled agroecological farming** can help locally producing fruits and vegetables all year round. Developing **integrated monitoring systems** is necessary for food safety and to determine the **ecosystem sustainable threshold** that ensures the sustainable harvesting of Arctic species according to scientific advice. Advances in **greenhouse technology and aquaponics**, such as automatic watering systems and precise temperature control, also allow for a greater variety and quantity of crops. Food system digitalization should however always strive to learn from **Traditional Ecological Knowledge** to propose appropriate solutions to improve **energy and water efficiency** and **reduce food waste** in harvesting, processing, distribution and storage operations. It is important however to stress the food sector cannot support local economies without providing **equitable access to renewable, lower-cost energy sources**. Development policies should particularly aim at enhancing indigenous and rural communities' capacities for low-carbon, context-adapted innovation. Finally, governments should provide **tax incentives for innovation** by cutting down the cost of investment in R&D and facilitating access to risk capital. Explicit support should be provided for university researchers and other research institutions, in the form of allocating grants and creating **"moonshot" type mission projects**.

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III. ECONOMIC DIVERSIFICATION

Banking on food tourism for locally-based economic development

Harvesting the tourism potential arising from flourishing local food systems.

The Culinary Tourism Alliance defines food tourism as *"the active pursuit of unique and memorable eating and drinking experiences, as well as agritourism experiences that connect what is being grown and produced in an area to what is being prepared and enjoyed by locals"*. Attracting tourists in the Arctic region has the potential to **boost local businesses along the food value chain**, from producers to retailers and restaurants. Moreover, food-related experiences contribute to the scaling-deep of Arctic food systems as tools to support the **preservation of local biocultural heritage** and the **revitalization of Indigenous foodways**. Food tourism can concomitantly help **prevent overtourism** by promoting slower experiences. Nevertheless, a **coherent transportation network** connecting the Arctic territories with each other and with southern citizens remains a *sine qua non* condition to this development. More emphasis should be placed on culinary experiences up North by tourism agencies. AEC also calls the **Michelin Guide to look North more often.** It should be understood that Arctic Chefs also participate in the promotion of local food products and their suppliers. Similarly, the organization of **food festivals and symposium** through partnership between local governments, producers and educational institutions represents an additional option to explore.

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Starving for more concrete cases and examples of best practices to leverage the numerous business opportunities the Arctic has to offer while respecting its peoples and ecosystems?

Fulfill your interest with the report Sustainable Investment Opportunities in the Arctic. Worth a read!

IV. PARTNERSHIP

Challenges

The **downward spiral characterizing the Arctic demographic landscape** currently stands as one of the biggest constraints for local economic development.

There is also still **limited pan-Arctic cooperation on food security**.

Why?

Brain drain and youth emigration: youth are leaving the Arctic to receive education and/or because they do not find meaningful job opportunities. The loss of human capital results in a general shortage of skilled labor.

***Compartmentalization*:** improvements are still to be made in terms of coordination within and among the different sectors and actors making up Arctic economies.

***Monitoring gap*:** a lack of up-to-date and comparable data regarding the components and role of Arctic food economies. This hinders a comprehensive allocation of public aids and could deter private investments.

What to do?

Fostering **proactive and inclusive partnerships among food system actors and sectors.**

The goal is to provide **more stable foundations for economic development** in the Arctic region, which relies on a qualified human capital, healthy small and medium-sized enterprises, and evidence-based policies.

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IV. PARTNERSHIP

Retaining and attracting qualified labor

Drawing on a qualified human resource base to capitalize on existing and emerging markets

Food industries have to offer sustainable employment for rural and remote regions. However, more **young people need to be incentivized to stay in the North** and work in companies contributing to food security and the sustainable transition. With just four million people, the Arctic also depends on **attracting an international workforce and know-how** to develop ambitious projects. Educational institutions should propose more **learning opportunities** related to the food sector and local and Indigenous food systems. It includes developing scholarships, grants and financial support programs for such programs. Furthermore, **learning how to start a business** should be included in all master and PhD programs, irrespective of the field. Public authorities should concomitantly provide more information to **increase awareness of existing and upcoming funding opportunities** supporting food producers and startups, for instance through targeted public campaigns. Educational institutions should also partner with innovation centers and enterprises to offer **relevant internship and traineeship programs**. The objective is both to make the food sector a desirable and meaningful career pathway, to empower women and marginalized communities, and to inspire young professionals to start food-related occupations in all areas of the supply chain, hence cultivating a long-term workforce.

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IV. PARTNERSHIP

Deepening multi-stakeholder partnerships

Pursuing a cluster-based approach to food production and regional economic development

Small and medium-sized enterprises stand to benefit from working together to overcome the challenges of producing in the North, *inter alia* via the creation of **eco-industrial parks**. The idea is to **capitalize on economies of scale** in production, distribution, marketing and sales. Moreover, building on the previous recommendation, industries should **partner with educational institutions and innovation centers** so as to create new markets and employment opportunities for northern communities, to add increased value to Arctic food products through skills development and entrepreneurial training in the early stages of food production and innovation, as well as to ensure that competencies and knowledge are available close to the industries that need them. **Cluster organizations** are pivotal in that matter as platforms for researchers to work closely with businesses. Furthermore, government authorities should always carry out a **consultation process involving local and Indigenous communities** when engaging in new projects, as well as work collaboratively with the latter to **include traditional foods in production and nutritional guidelines**. **Multi-stakeholders audits** should also be conducted on infrastructure and funding needs. Nonetheless, all of these partnerships will require **cross-sectoral "translators"** to be trained to facilitate cooperation between local and Indigenous representatives, various scale companies, researchers and policymakers.

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IV. PARTNERSHIP

Monitoring food economies

Improving policy-making and accountability through significantly increasing the availability and consistency of data on food systems

Quality, timely and reliable data on the different elements and components of the food system is essential for policymakers to adopt **comprehensive solutions tailored to the socio-environmental peculiarities of each Arctic territory** and determine coherent production requirements. AEC suggests that all Arctic states publish an **annual report on the state of the food sector** in their Northern regions, as well as regular **impact assessments** on the short and long-term impacts of policies aiming at improving food security and nutrition. **Transparency** should be ensured through sharing information with all stakeholders concerned and interested. **Data collection and analysis should involve active participation** from Indigenous representatives, local governments, researchers, leading enterprises, and small and medium-sized businesses. AEC's Report on the State of Arctic Food could serve as a framework for future monitoring reports. However, for this to be possible, **food producers must also be incentivized to publicly report data**. In addition, **administrative work on food data compilation** should be an ongoing form of **pan-Arctic collaboration and good governance**. This could include creating and upkeeping an **online Arctic Food Database**, which would support the work of the Arctic Council and its working groups in promoting food production as a vector and a goal for regional cooperation.

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ARCTIC SPIRITS

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Nuuk
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Arctic Spirits

The Arctic climate is repeatedly pointed out as the main culprit for poor agricultural and horticultural production, unreliable transportation, high costs of exogenous materials, navigation hazards, and many more regional challenges. But, northern ecosystems offer, at the very same time, unique peculiarities on which Arctic communities have build their traditions and livelihoods and that serve as a catalyst for today's innovators. Spirit production is an interesting example. The combination of Arctic fresh water, botanicals and berries with Northerners' skills and ingenuity, results in some of the purest alcoholic drinks in the world being made under the northern lights.

Most Arctic spirit production takes place in Scandinavia, with Norway as its leading cluster. **Aurora Spirit**, in Lyngen, is deemed to be the world's northernmost distillery. Under the Bivrost brand, it manufactures various types of spirits, such as vodka, aquavit, gin and whisky. In the traditional fishing village of Myken, 32 km from the mainland, can also be found the **Myken Distillery**, seemingly the world's first Arctic whisky distillery. Northern Norway may, as well, house the northernmost brewery in the world. **Macks Ølbryggeri** was founded in 1877 and is still owned by the same family today. The main production is located in Nordkjosbotn, near Tromsø. Macks' Polar Beer and Arctic Beer were the first beers on both the North and South Poles. But the northernmost brewery may also be the **Svalbard Brewery** in Longyearbyen.

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Source:

Arctic Spirits

The same trend of multiplication of distilleries and micro-breweries is seen is Finland's and Sweden's northern counties - with businesses such as **ÓGIN**, **Polarblend-Lapland Spirits**, **Sangen**, **Tornio Distillery Lójhtu**, or **Lapland Brewery** in Rovaniemi -, and to a lesser extent in the other Arctic states.

Arctic Harvest is family-owned and operated farm-to-bottle distillery in Alaska, situated just shy of the Arctic Circle. Products include vodka, moonshine, and several whiskeys. **Alaskan Spirits** is an Anchorage's business making vodka out of potatoes. **Anchorage Distillery** proposes a wide range of spirits made from Alaska's barley and spiced with local botanical.

In Iceland, **Eimverk** is a family operated distillery founded in 2009 with the mission to make premium Icelandic liquors strictly from local ingredients. 3 spirits are produced: the Flóki whisky, the Vor gin; and the VítiIcelandic Brennivín. The **64°Reykjavik Distillery** is a family run, independent micro-distillery, handcrafting spirits using Icelandic berries and botanicals.

Greenland's **ISFJORD** proposes gin, vodka, whisky, rum and aquavit that contains the extremely pure and soft water from icebergs combined with local botanicals. In the Faroe Islands, the newly-created **Faer Isles Distillery** is one of the most remote distilleries in the world.

And **NuBrewCo** is Canada's northernmost brewery is located in Iqaluit, Nunavut!

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Source:


CIRCLE