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Finland, International Trade
March 28, 2025
Feeding Finland: Reducing Dependence on International Trade

Known for its advocacy of sustainable practices, Finland aims to be carbon neutral by 2035 (Carbon Neutral Finland). The same source complements the factor that Finland also is committed to efficient resource management and technological innovation. Some examples of how they remain efficient are renewable energy, nature conservation, and sustainable living. Finland remains strong in some ways, however the country remains deeply dependent on international trades, specifically food trades. Finland imports almost a tenth of their food supply according to the 2023 World Bank study (Finland - Food Imports). Importing a significant amount of the country's fruits, vegetables, meat, and animal feed. While international trade is beneficial, providing access to the population's food supply, it's allowing Finland to be vulnerable to losing a great amount of the food that feeds them. Seeing that today's society conflicts affect food prices and availability, it's a major impact on how our global supply chain can be affected. For Finland to increase their sustainability and food security, they need alternatives in their agricultural methods. In doing so, they can successfully reduce their dependence on international imports while maintaining what they believe in, keeping their practices environmentally, economically and socially sustainable. Finland can reduce their reliance on food imports by adopting sustainable agricultural practices like vertical farming, aquaponics, and urban agriculture, supported by technology and policy.

Finland is a country in northern Europe, described as a nordic country, located by Sweden, Norway, and Russia. Its coastline is along the Baltic Sea, which has a unique and diverse ecosystem. Finland is known for its forests, thousands of lakes, as well as its harsh winters. Experiencing long, cold seasons with limited daylight in winter and almost continuous daylight in the summer, this is known as the Midnight Sun. Finland has a difficult climate, but is still ranked one of the happiest countries in the world (Hunter). Finland has a high quality of life and deep connection to nature. Finnish culture emphasizes sustainability, innovation, and self-sufficiency, making it an ideal place to find solutions for food security. Their diet usually consists of fish, rye bread, dairy products, and wild berries. They recently have increased reliance on imported fruits and vegetables throughout the past few years.

Finland's population as of March 27, 2025 was 5,621,754, estimated to be 5,623,329 by the middle of 2025 (Finland Population). According to that same source, 86.68% of their population is considered urban, meaning 13.32% is rural. Finland's government consists of the population voting for their leaders, so they have a democratic government. The Prime Minister runs the country, and the President handles foreign affairs. The government really seems to care for education, the environment, and social welfare. Their focuses align with how they truly want to achieve a good quality of life. Their government also works towards farming and food production improvements specifically by advocating for agriculture and forestry. Since Finland is a part of the European Union, they have to follow trade rules set by the EU. While following the trade rules, they also invest in new technology and clean energy.

In 2022, 7.373% of Finland was arable land, defined as "land under temporary crops, temporary meadows for mowing or for pasture, land under market or kitchen gardens, and land temporarily fallow" (Finland -

Arable Land). Some of the crops that Finland grows are oats, wheats, rye, potatoes, sugar beets, and more. Their other important products include a lot of meat, milk, eggs, and fish. Finland exports machinery and equipment, mineral fuels, paper, paper products, iron and steel, as well as vehicles (Finland Exports).

The average farm size in Finland is 51 hectares (126 acres), compared to the United State's average farm size at 463 acres (Finland). There are roughly 44,500 agricultural holdings in Finland, an agricultural holding is an independent unit of agricultural production, managed by one person, meaning all livestock and land is used for agricultural purposes. The geography of Finland is relatively flat, however the Scandinavian mountains are into the northwestern part of the country. Finland is over 70% of thick woods, so it's definitely a great place to source different forest foods. Another great source is their lakes! Like Minnesota's nickname "Land of 10,000 Lakes", Finland's nickname is "Land of a Thousand Lakes" (Sidder). Across all of Finland, rainfall isn't abundant for the country as a whole, it averages 400 mm (15.5 inches) per year. The highest rainfall has gotten to 900 mm and the lowest recorded is under 300 mm.

A typical family in Finland has about 2-3 members. They usually dwell in wooden houses, but another common alternative for them is apartments. Most families' diets consist of cereals, grains, fish, berries, mushrooms, dairy, potatoes, meats, pastries, breads, chocolate, and coffee. Finlander's mainly source their foods from grocery chains such as k-market, s-market, and sometimes some department stores have grocery sections. They forage for their berries and mushrooms in their forests, and source their fish from their water sources like lakes, oceans, and rivers. Finlanders cook their food by frying, boiling, smoking, salting, and pickling their foods.

Finland has a strong economy with jobs in healthcare, education, technology, manufacturing, and agriculture. Finland has a handful of major industries, including forestry and engineering. Many people work for the government, so Finland has a large public sector. Farming and food production make up a smaller part of the economy, but they are important for the country's food security. The average yearly salary in Finland is about 48,000 euros, which is about $53,200. Families have free access to education, and affordable access to health care. Finland provides education from pre-primary up to higher education. The health care is publicly funded, so it is harder to get into an appointment or overall waiting times. This can lead to a number of unmet medical needs. The average family has access to daily needs and amenities, but the cost of living is high. The average net taxes on products for Finland is $4,931.98, and the average for the United States is $2,764.29 (Finland vs United). Some other things that finlanders struggle with are food prices, geographic challenges (farming), food waste, as well as consumption habits, and dependency on imported goods.

Finland relies heavily on international trade and is a significant part of Finland's food security to feed its population. Any disruption in global trade could negatively impact Finland's ability to provide food. Some research has been showing that Finland's reliance on imported goods will increase by 4.4% in 2025 (Finland: Import Volume). There are many reasons as to why they're relying on imports more, they include climate change, economic conditions, consumer demand, as well as dietary shifts. Finland imports more than they export goods, which can improve their economy but leave a wide gap for vulnerability. For the urban population of Finland, it can increase food availability, employment opportunities, and industry, as well as dietary diversity. For the rural population, it can improve agricultural stability, access to supplies and equipment, as well as local food security. These are only the positive opportunities that

international trade affects in Finland. One of the very impactful negatives to the urban populations side could include higher prices and food shortages when there is any sense of disruption in the supply chain. Additionally, urban jobs can be affected if Finland imports too many goods, making local production less competitive, leaving some businesses struggling. For the rural populations, international trade can hurt local farmers and small businesses, imported goods increase the competition for local goods because imported goods are cheaper. Many Finnish farmers struggle competing against large-scale producers, resulting in lower profits and job loss. Depending on imported animal feed also makes farms vulnerable to international trade disruptions.

Disruptions for the rural population farmers can force them to move to the cities for more job opportunities. International trade affects every individual differently, both positively and negatively. When comparing the effects of women vs men in this topic, women make up a large portion of workforces such as education, health care, and even some service industries. Economic disruptions have a higher impact on these work forces. As women primarily take on household food management, rising food prices can put extra pressure on households. Many rural women work in the agricultural side of things, and imported foods can threaten their jobs and independence. Men also face these struggles if Finland relies too much on imports instead of local production. For the elderly in Finland, food prices can be detrimental to their incomes. Most elders get fixed pensions and they may struggle to afford fresh and healthy food. The children and youth of Finland are the main impacted individuals when it comes to food security issues. Children need proper nutrients to grow and develop. School meal programs depend on imported food and affordable local goods. For the youth, if an individual is interested in the agriculture side of careers, they might be discouraged because it's becoming less profitable and overall decreases future generational farmers.

Besides the individuals affected by this, the environment is also impacted by international trade. Imported food requires distance for it to travel, contributing to high greenhouse gas emissions. Finland's imports are delivered using planes, ships, and trucks. Finland has climate goals, so international trade increases their carbon footprint. Overfishing is also a practice that is affecting Finland. Finland currently imports a high number of their fish and seafood, depending on imported seafood allowing places to overfish is damaging marine ecosystems. Developing more local aquaponics and fish farming systems could help reduce this specific impact. Finlanders love their land, but international trade is impacting soil health. Cheaper sources of food means there is more abandoned farmland and negatively impacts soil quality. Implementing sustainable practices can improve soil quality and increase Finland's self-sufficiency, reducing need for imported goods.

There are some solutions that have been tried in the past, they include: greenhouse cultivation, food storage improvements, alternative solutions, encouraged foraging, farming improvements, as well as government support for individuals who grow their own grains. One of the main solutions that needed improvements was the greenhouse option. They needed to expand their efforts by not only size, but what they grew as well. Another solution that needed to be improved was the factor of education of soil health for the farming efforts. Finland's soil is naturally acidic and keeping the soil a good solid neutral but slightly acidic is very important for their agriculture. If their soil stays acidic without anything to help neutralize it, it could lead to serious problems like contaminated drinking water, respiratory issues and for long periods of time causes internal organ damage for not only humans, but livestock. These can cause a significant issue in Finland's food security.

Finland already supports fish farms, so integrating fish farming with vegetable growing could be a great solution to overfishing and relying on imported fish. Combining greenhouse farming with indoor fish farming to make a system that recycles nutrients, is also known as aquaponics. It can help produce more native fish like perch and whitefish. This method seems to be working really well for both Canada and Sweden. The fish are raised in tanks with plant beds above or around the tanks, the fish then produce waste which is then used by the plants, filtering the water which is then cycled back to the fish. The negative aspects of this solution are the operation costs, the amount of monitoring it requires, as well as the fact that some fish species are not a good fit for this kind of farming. But this solution is an efficient way to produce protein and vegetables at the same time, it's also a sustainable innovation, using less water than traditional farming.

Finland's cold climate is very limiting for a longer farming season, but a great solution to that is vertical growing. Vertical growing could significantly help with their very own production of fresh foods that they would normally import. Vertical growing is just like it sounds, growing plants vertically versus horizontally. Growing plants vertically can significantly improve the amount that is produced in one area compared to horizontally. Finland could vertically grow their own produce in their greenhouses. This solution requires a climate-controlled greenhouse, light, water, and humidity control. One of the requirements with this system is it requires a lot of management, if something is not balanced, all of the crops could be lost. This could potentially expand the use of controlled-environment agriculture with renewable energy. Japan and Singapore use vertical farming to grow leafy greens so they can rely less on imported greens. This solution utilizes water and space, farmers can use 98% less water and 99% less land (Dupuis). This overall has a high energy consumption if not powered by renewable sources. It can be expensive to set up and maintain, and overall can be limited to certain crops like leafy greens, herbs, and small fruits. The potential positives for this is year-round food production no matter the weather, using land efficiently, as well as reducing reliance on imported produce. Another way to keep it efficient and use the space efficiently would be having it on an automated carousel system, making it into a vertical growing carousel. It would allow the greenhouse to get a higher yield because the carousel would allow all plants to get equal amounts of light versus the traditional layout. There are many routes you can go with the energy efficiency as well, you could incorporate the fish farming and use the flowing water to power the rotation.

Finland should start encouraging rooftop greenhouses, not to just anyone, but businesses. By offering tax breaks and financial incentives, the government can help companies invest in greenhouse technology. This can turn unused rooftop space into productive farming areas. These greenhouses can grow fresh food year-round, reducing the need for imported goods while lowering transportation emissions. Businesses that start participating can benefit from lower tax rates, potential cost savings on food production, and can improve their corporate sustainability ratings, attracting environmentally conscious consumers. Rooftop farms can help reduce building energy costs by providing natural insulation and absorbing heat. Initial costs may be high, but government grants and tax incentives will offset the expenses. This is an economically practical and environmentally friendly solution for the businesses and consumers of Finland's products. While rooftops can provide fresh vegetables, the space for grains is limited, so there would be only select crops available for this plan. Another possible negative aspect to this, is that not all buildings can support the weight of a greenhouse or other growing systems on their rooftops. While there are negative aspects, the positive outweighs the negative. This solution overall increases local food production, especially in urban areas where space is very limited. Rooftop greenhouses reduce food transportation costs and emissions since food is grown where it's consumed. This can overall be a part of sustainable city planning, improving air quality and biodiversity.

Though all of these solutions seem great, they can't meet all of the population's needs in Finland. If Finland found a way to combine all of these solutions, it would significantly reach the needs of more individuals. They would need to study each system and its working parts, and test them with each other. Then start to develop the plan, expand their ideas, add renewable energy options, educate others, get the government involved to not only promote but support, then get the community involved, and monitor and evaluate their solution. There's many ideas as to who would manage this project… Some examples are: the government, academic institutions, research centers, industries, organizations/groups, and more. This could be funded in several different ways, but the first step would be research grants. The other options for funding include national government grants and subsidies, EU funding, and social impact bonds. Finland would need to implement or amend their policies, some include: zoning laws, urban farming permits, land tax, green energy incentives, and financial support.

Finland can reduce their reliance on food imports by adopting sustainable agricultural practices like vertical farming, aquaponics, and urban agriculture, supported by technology and policy. Finlanders highly value locally sourced, sustainable and organic foods. If Finland added renewable energy sources to the hybrid solution, along with water conservation/cycling, and cost-effective production methods, this project would be significantly aligned with their beliefs and it would be a sustainable solution. By embracing these solutions and strategies, Finland can be successful in their efforts to have long-term food security, protect their environment, and create new economic opportunities. Finland has the potential to lead the way in an eco-friendly food production that benefits both urban and rural communities.

Works Cited

"Carbon Neutral Finland 2035." *Central Government Debt Management*, 25 Feb. 2025, www.treasuryfinland.fi/investor-relations/sustainability-and-finnish-government-bonds/carbon-neutral-finland-2035/#:~:text=Finland's%20obligation%20under%20EU%20law,emissions%20are%20equal%20to%20removals).

Dupuis, Allison. "Vertical Farming: Everything You Need to Know." *Eden Green*, Eden Green, 21 Nov. 2024, www.edengreen.com/blog-collection/what-is-vertical-farming.

"Finland - Arable Land (% of Land Area)2025 Data 2026 Forecast 1961-2022 Historical." *Finland - Arable Land (% Of Land Area) - 2025 Data 2026 Forecast 1961-2022 Historical*, tradingeconomics.com/finland/arable-land-percent-of-land-area-wb-data.html#:~:text=Arable%20land%20(%25%20of%20land%20area)%20in%20Finland%20was%20reported,Bank%20on%20March%20of%202025.&text=Arable%20land%20includes%20land%20defined,of%20shifting%20cultivation%20is%20excluded. Accessed 27 Mar. 2025.

"Finland - Food Imports (% of Merchandise Imports)2025 Data 2026 Forecast 1963-2023 Historical." *Finland - Food Imports (% Of Merchandise Imports) - 2025 Data 2026 Forecast 1963-2023 Historical*, tradingeconomics.com/finland/food-imports-percent-of-merchandise-imports-wb-data.html#:~:text=Food%20imports%20(%25%20of%20merchandise%20imports)%20in%20Finland%20was%20reported,compiled%20from%20officially%20recognized%20sources. Accessed 27 Mar. 2025.

Finland Exports by Category, tradingeconomics.com/finland/exports-by-category. Accessed 27 Mar. 2025.

"Finland Population (2025)." *Worldometer*, 27 Mar. 2025, www.worldometers.info/world-population/finland-population/#google_vignette.

"Finland vs United States Economy > Tax Stats Compared." *NationMaster.Com*, NationMaster, www.nationmaster.com/country-info/compare/Finland/United-States/Economy/Tax. Accessed 28 Mar. 2025.

"Finland." *Agriculture and Rural Development*, agriculture.ec.europa.eu/cap-my-country/cap-my-country/cap-my-country/cap-strategic-plans/finland_en. Accessed 27 Mar. 2025.

Finland: Import Volume Change Forecast | Statista, www.statista.com/statistics/1112876/forecast-for-import-volume-change-in-finland/. Accessed 28 Mar. 2025.

Hunter, Marnie. "These Are the World's Happiest Countries in 2025." *CNN*, Cable News Network, 20 Mar. 2025, edition.cnn.com/travel/worlds-happiest-countries-2025-wellness/index.html.

Sidder, Aaron. “Finland Country Profile - National Geographic Kids.” *Geography*, National Geographic Kids, 16 Feb. 2021, kids.nationalgeographic.com/geography/countries/article/finland#:~:text=The%20Finnish%20landscape%20is%20mostly,actually%20has%20187%2C888%20of%20them.