



## Position paper

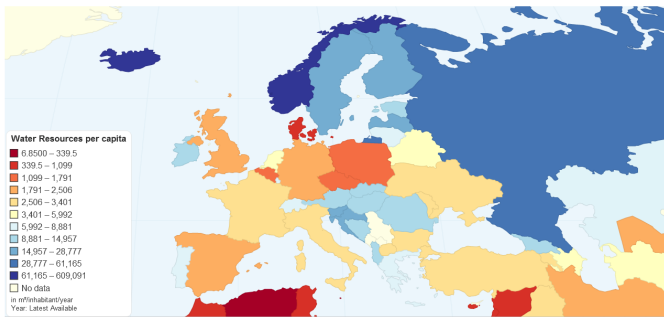
# Emerging role of Boreal food production in the European context - securing European self-sufficiency and carbon neutrality by 2035

Hanna Karikallio, Anu Kaukovirta

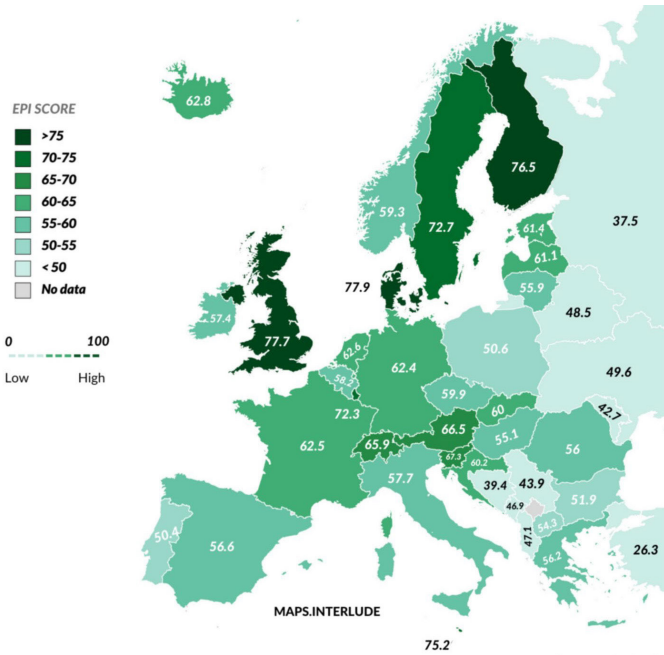
The importance of the northern Boreal regions for the world's sustainable food production and food security will increase in the future. Drought and erosion caused by climate change threaten large areas of cultivation globally. In the Boreal region, however, climate change is predicted to prolong the growing season and increase already excellent water resources. Furthermore, new important crop species can be successfully cultivated at 60° latitudes and above. Therefore, it has been estimated that Nordic countries like Finland can take a larger responsibility for European food security and self-sufficiency in the coming decades.

## Strengths of Finnish agriculture

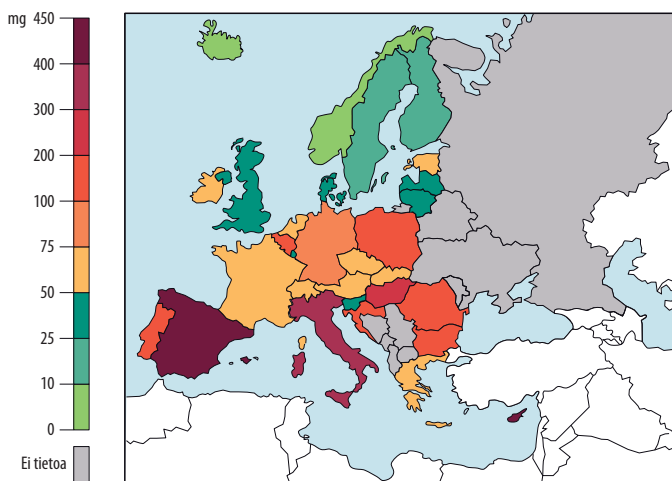
**Agricultural conditions in Finland:** Finland is the world's northernmost agricultural country. Agriculture is possible above 60° latitudes due to the Gulf Stream. The summer growing season is short and very intense due to long daylight hours. In winter, most of the fields are covered with snow and frost for 4–6 months. Due to the long winter period, significantly fewer plant pests exist on arable land. Main arable crops are oats, barley, and grass.



**Figure 1a.** Total renewable water resources per capita by EU country. Source: FAO of the United Nations, AQUASTAT online database



**Figure 1b.** The Environmental Performance Index (EPI) in EU countries 2022. Source: epi.yale.edu



**Figure 1c.** Use of antibiotics in livestock production in the EU. Source: European Medicines Agency, European Surveillance of Veterinary Antimicrobial Consumption

**Figure 1d.** European Innovation Scoreboard 2022. Source: Eurostat

## 1. Production environment is favorable for sustainable, innovative, and safe food production

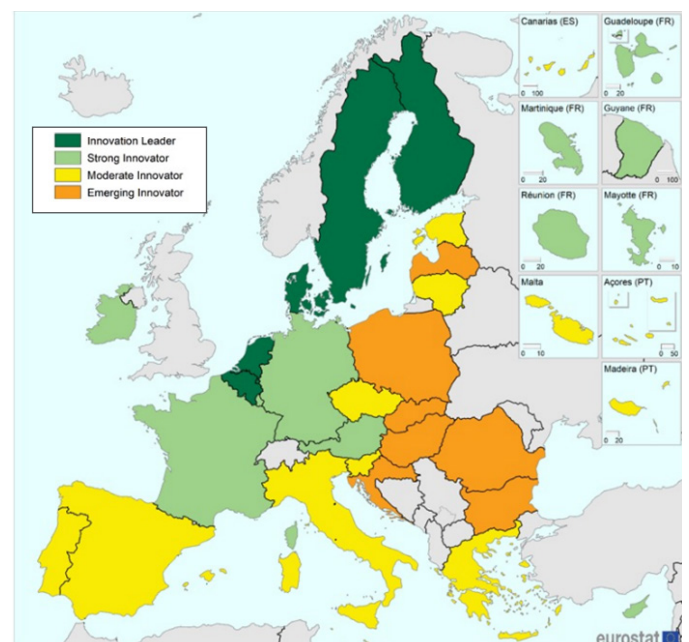
- Water resources are among the highest in European countries (Fig. 1a).
- Air pollution levels are low, and the environment is clean. Environmental Performance Index is highest among the European countries. (Fig 1b).
- The use of antibiotics in livestock farming is very low and use of herbicides in plant production is below the European medium (Fig 1c).
- Level of education among farmers is high and Finland is recognized as a country of innovations (Fig. 1d).

## 2. Grass-based production is the key to sustainable milk and beef production

- Grass is the main feed for milk and beef cattle. As a perennial plant, grass is almost the only crop plant that is preserving soil carbon and a large share of grasslands are carbon sinks.
- Milk and beef production are tightly connected, and a majority of beef is originating from the milk chain.

## 3. Forests are an underutilized source of nutritious foods

- Boreal forests are excellent sources for wild berries and mushrooms. Only a minority of the yearly crop is harvested.
- Wood and forest residues are a source of multiple bioactive and functional compounds for food production.



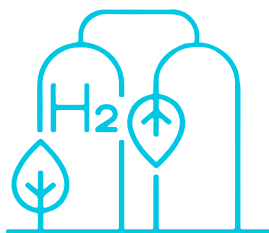
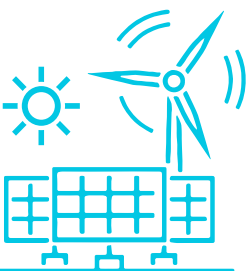
## Food production is facing similar challenges across Europe

Food production is at a transition, caused by both external pressure for change and efforts to solve internal problems related to the food system. The direction of food production must be reversed towards more sustainable practices, without forgetting security of supply, and the profitability of primary production.

We have selected 3 large pan-European challenges, possible paths to solutions, and tools:



This creates a real opportunity for the consumer to make value-based choices, and for a farmer to earn more from sustainably produced quality foods. One example is animal welfare labels supporting ethical livestock production ([www.luke.fi/en/projects/animal-welfare-label-project](http://www.luke.fi/en/projects/animal-welfare-label-project)).



### CHALLENGE 1. IMPROVING THE ECONOMIC AND SOCIAL SUSTAINABILITY OF AGRICULTURE

#### Possible solutions & actions

##### → Better know-how and data use for farm management:

- Active use of economic, environmental and technological data to support farmers' decision-making.
- Versatile ICT and automation education for farmers.
- Develop national and European farmers' knowledge hubs and data banks.

##### → More attention to the well-being of farmers and farming families

- Establish research-based concepts to improve the social well-being of farmers and farming families.

##### → Joint European development of fair data economy practices

- Joint European efforts to develop fair data economy. In particular, *Agricultural Data Space* is an important way to support the active and independent role of farmers in the food system.
- Increase transparency in food production by improving and integrating agricultural data economy. The added value generated i.e. by sustainable agricultural methods is verified with the help of data.

##### → Smart structural development of agriculture

- More research-based knowledge to support generation change and to develop agile exit models when leaving the sector.
- Direct agricultural subsidies to support structural development and enable larger and viable farms.

### CHALLENGE 2. DEPENDENCY ON NON-EUROPEAN SOURCES OF FERTILIZERS AND OTHER INPUTS

#### Possible solutions & actions

##### → Increase European production of fertilizer and green ammonia:

- Significantly increase RD&I funding and investments in green hydrogen and ammonia production.

##### → Develop a regional bio-circular economy,

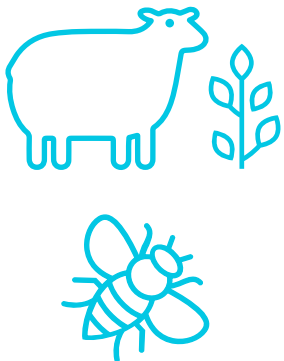
- Strong RD&I contribution to increase the use of agricultural side streams for regional energy and fertilizer production.

##### → Build alternative logistical routes for critical inputs

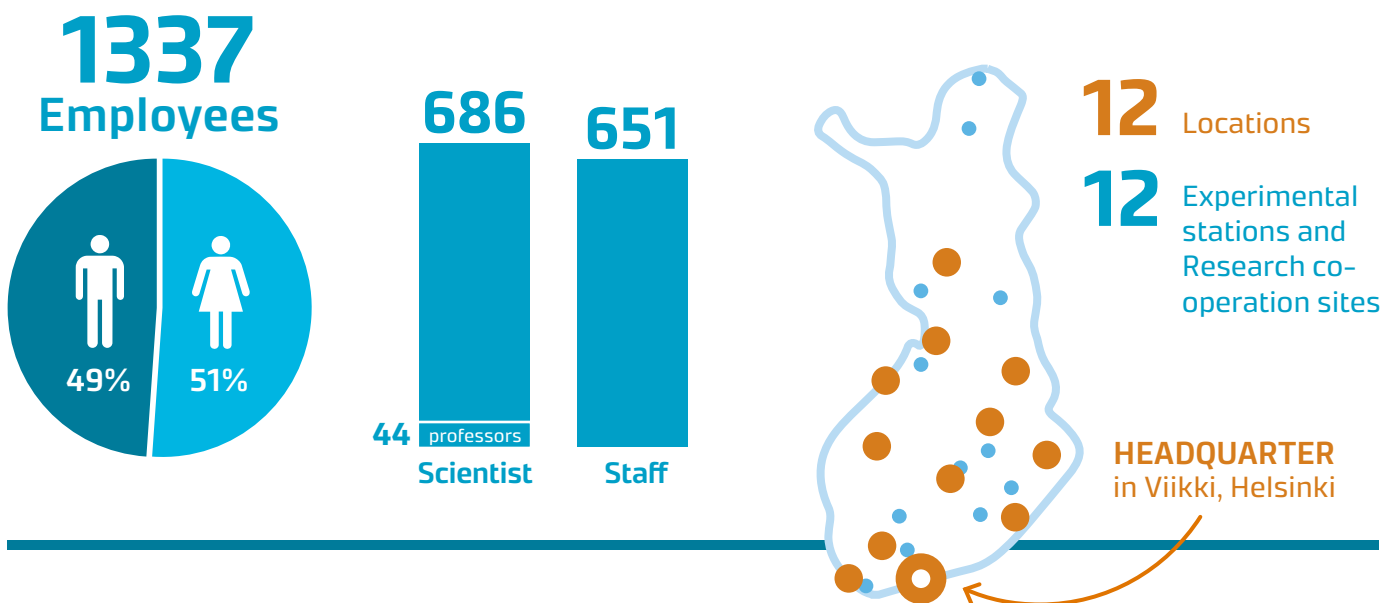
- The security of logistical routes should be strongly highlighted and new routes should be designed.
- Secur the Baltic Sea for logistics in Northern regions of Europe.

### CHALLENGE 3. MITIGATION OF CLIMATE CHANGE AND REINFORCING BIODIVERSITY

#### Possible solutions & actions



- **Develop practices and methods to increase the role of arable land as a carbon sink**
  - Study and select the most efficient cultivation measures to restore carbon in arable lands.
  - Integrate soil carbon models in life cycle assessments (LCA) and harmonize pan-European methodology.
  - Develop grass based biorefineries for food and other applications to ensure increased amounts of grass in crop rotation cycles.
- **Redirect agricultural subsidies towards ecosystem services (carbon sequestration, boosting of biodiversity, restoring of cultural landscapes)**
  - Active reform of subsidy policies. The ecosystem services provided by agriculture should form the basis for the CAP.
- **Better practices to support biodiversity in agricultural production**
  - Better understand links between biodiversity, ecosystem services, and natural capital to redirect actions fairly and efficiently.
  - Actively develop and harmonize biodiversity indicators for different kinds of agricultural environments in Europe.



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Natural Resources Institute Finland (Luke)  
Latokartanonkaari 9, FI 00790 HELSINKI  
Phone: +358 29 532 6000

#### Luke Position Paper

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