Food security and the role of Finland in future food production

ChemBio 2019

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28.3.2019
Prevalence of Hunger

- 42 million in Latin America and the Caribbean
- 243 million in Africa
- 520 million in Asia
- 10 million in other regions

Source: Food and Agriculture Organization of the United Nations, IFAD, unicef, World Food Programme, World Health Organization
Many faces of malnutrition

Every country in the world is affected by malnutrition

Countries with a burden of at least one of: childhood stunting, anaemia in adult women, overweight in adult women

- At least a single burden
- At least a double burden
- A triple burden

The Global Nutrition Report 2018
Conflict events in Africa 1997-2015
Disasters related to climate extremes

FIGURE 15
INCREASING NUMBER OF EXTREME CLIMATE-RELATED DISASTERS, 1990–2016
March 2019: climate extremes
Projected impact of climate change on agricultural yields

* A key culprit in climate change – carbon emissions – can also help agriculture by enhancing photosynthesis in many important (...) crops such as wheat, rice, and soybeans. The science, however, is far from certain on the benefits of carbon fertilisation.*

This map represents the case of beneficial carbon fertilisation processes.

Source: Cline W., 2007, Global Warming and Agriculture.
Renewable water m³/capita/year
Emissions by sector

- Energy: 35%
- AFOLU: 24%
- Industry: 21%
- Transport: 14%
- Buildings: 6%

FAO 2015 (originally IPCC)
Food loss and waste

Source: World Resources Institute
(Agro)biodiversity under threat

More than 6,000 plant species have been cultivated for food.

Fewer than 200 make contribution to food production globally, regionally or nationally.

Only 9 account for 66% of total crop production.

Source: FAO
Human fertility projection 2025

Source: UNFPA
Finland’s role?
### Finland vs. EU vs. World

<table>
<thead>
<tr>
<th></th>
<th>Finland</th>
<th>EU</th>
<th>World</th>
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</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
<td>5.5 million</td>
<td>510 million</td>
<td>7 600 million</td>
</tr>
<tr>
<td><strong>Agricultural land</strong></td>
<td>2.2 mill ha</td>
<td>175 mill ha</td>
<td>1 500 mill ha</td>
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<tr>
<td><strong>Agricultural land/capita</strong></td>
<td>0.40 ha</td>
<td>0.34 ha</td>
<td>0.20 ha</td>
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<tr>
<td><strong>Cereal production</strong></td>
<td>3.7 mill tn</td>
<td>317 mill tn</td>
<td>2 400 mill tn</td>
</tr>
<tr>
<td><strong>Milk production</strong></td>
<td>2.3 mill tn</td>
<td>168 mill tn</td>
<td>747 mill tn</td>
</tr>
</tbody>
</table>

Source: Karttunen 2018
Food imports and exports

Value of food imports about 3 x value of exports

- Outsourcing of resource use (land and water)
- Displacing of environmental impacts (e.g. carbon footprint)
- Impact on biodiversity
- Animal welfare and production practices beyond our control

Exports from Finland:

- Currently not building on our strengths: innovations, natural resources, freshness
- Exporting commodities with high water demand (e.g. beef)

Sources: e.g. Lehikoinen et al. 2019; Sandström et al. 2018
Situation in Finland

Enough food available for all.

Luke estimates: self-sufficiency ratio 80% (in euro)

Problems in our food system:

- Low agricultural profitability
- Nutrition: overweight, obesity
- Food aid for tens of thousands of people
- Environmental sustainability
- Food loss and waste
- Market concentration
Would a system approach help?

Instead of sub-systems, talking about the whole food system, why?

- Interdependencies in the system: an action in one part will affect other parts, sometimes unexpectedly.

- Many wicked problems, often intertwined. By trying to fix one, we may make the other even worse.

Coming out of our bubbles/silos: need for a comprehensive food policy that brings together administrative sectors and food system actors.
Tuntematon
ruokajärjestelmä
Eväitä kokonaisuuksien
ymmärtämiseen