Global trends - A synthesis based on recent key foresight exercises

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Objective

To summarise and analyse recent foresights on food and agriculture, and establishing a database on foresight studies for the analysis of key drivers and trends with implications for food security, poverty and environmental sustainability.
Methodology

A three-step process:

(STEP 1)
Establish a database to define and take stock of the main drivers in food system analyses and sustainable food and nutrition security - Which forces are assumed to shape the future food system? Which are those considered in the literature?

(STEP 2)
Look and analyse global megatrends that will shape the world in the years to come.

(STEP 3)
Where are the gaps and future needs?
STEP 1

Establish a database - Which forces/drivers are assumed to shape future food systems?
Search for most accessible and comprehensive databases for literature search: Scopus, Web of Knowledge, Google Scholar, Institutional and foresight studies archives

**Topic:** FORESIGHT  
**Time Span:** 2010 - 2017

- **ISI = 1.928 results**
- **Scopus = 2.559 results**
- **Google Scholar = 20.000 results**

Refining search for research areas:
- Environmental Science Ecology
- Science Technology
- Agriculture
- Food Science Technology
- Water Resource
- Forestry
- Demography
- Biodiversity Conservation
- Plant Science

- **ISI = 411 results**
- **Scopus = 300 results**
- **Google Scholar = 5.040 results**

Refining search for keywords:
- Food Security
- Climate Change
- Resources (Water)

Refining search for «Food systems, food and nutrition security and natural resources management» pertinence

The result is a preliminary database that contains 316 studies of which 202 categorized as "foresight work" (including foresight, research paper, reports and opinion articles with a forward look dimension).
## Screenshot of the Database

<table>
<thead>
<tr>
<th>PROG</th>
<th>SOURCE</th>
<th>YEAR</th>
<th>TYPE OF DOC</th>
<th>TITLE</th>
<th>AUTHORS/AFFILIATION*</th>
<th>METHODOLOGY</th>
<th>WEBLINK/PDF</th>
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<tbody>
<tr>
<td>112</td>
<td>Institution/foresight Databases</td>
<td>2015</td>
<td>Reports</td>
<td>Disruptive innovations and policy responses: self-production, insects as food, flying sensors, graphene &amp; others</td>
<td>Gavriel Avigdor and René Wintjes</td>
<td>Qualitative and quantitative research, reviewing, reporting, data analysis</td>
<td>pdf</td>
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<tr>
<td>113</td>
<td>Institution/foresight Databases</td>
<td>2015</td>
<td>Reports</td>
<td>Ending Hunger in Africa - The elimination of hunger and food insecurity on the African continent by 2025</td>
<td>NEPAD</td>
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<td>Reports</td>
<td>Food System Shock - The insurance impacts of acute disruption to global food supply</td>
<td>Trevor Maynard</td>
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<td>Tasmania’s bioeconomy: using all capitals to sustain innovative and entrepreneurial agrifood value chains</td>
<td>Meinke, H., Bonney, L., Evans, K. and Miles, M.</td>
<td>Quantitative research</td>
<td>pdf</td>
</tr>
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</table>
Most Represented Drivers in Food Systems and Food Security Analyses
(202 studies)
STEP 2

Which are the global megatrends that will shape the world in the years to come?
Megatrends

definition

• Megatrends are defined as large scale, long-term driving forces that are observable now and could have significant influence on the future impacting most human activities, processes and perceptions.

• By looking at a wider range of trends (i.e. social, technological, environmental, economic, and policy related) it is possible to acquire a holistic picture and identify less explored impacts and linkages on a given system (i.e. agri-food systems and sustainable food secure systems).

• Trend analyses have a broader nature and tend to look beyond specific areas of interest (food systems), but can be functionally used to identify gaps, key inter-linkages, and leverage points to address future issues.
Megatrends
*a systemic approach*

• By using a systemic approach, it is possible to better understand how food systems transition towards sustainability could be set in motion and what are the necessary steps to take to a full transition.

• Have all the major megatrends been appropriately analysed and discussed in the literature on the future of the food system and prospective future food security?

• If a sustainable food system requires a functioning interaction between all of its parts, we must begin to look beyond the usual areas of concern, apply a wider approach that considers, for a systemic perspective, all the major trends that influence the evolution of the food system.
Megatrends analysis

Methodology

• The list of megatrends were derived on an iterative process involving literature review of all the major trend reports (NIC, EEA, FAO, OECD, etc.) and other secondary sources, consultation with foresight experts and a steering committee, series of workshops.

• Trend titles and descriptions were tested and consolidated. Each trend was coupled with a fiche with descriptions projections, quantitative indicators, etc.

• List of 14 megatrends was placed against the results of the drivers emerging from the database search.
14 megatrend shaping the future

The following set of megatrends are long-term driving forces that are observable now and will most likely have significant influence on the future.
Which trends are already addressed (i.e. 'the usual suspects')

2 Climate change and environmental degradation
5 Aggravating resource scarcity
8 Accelerating technological change
6 Increasing demographic imbalances

Which trends are recognised as important but not addressed properly?

1 Diversifying inequalities
12 Continuing urbanisation
11 Shifting health challenges

Which trends are game changers and not addressed?

4 Growing consumerism
13 Increasing influence of new governing systems
7 Expanding influence of the East and South

A systemic analysis would also take these trends into account:

9 Changing nature of work
3 Increasing significance of migration
10 Diversifying education and learning
14 Changing security paradigm
STEP 3

Where are the gaps and future needs?
When the list of 14 megatrends was placed against the results of the drivers emerging from the database search we found that:

• A cluster of trends has been adequately explored and tackled
• A second cluster requires further investigation
• A third cluster has been underestimated or until recently not adequately explored
Identifying Gaps

FOOD SYSTEMS DRIVERS
- CLIMATE CHANGE
- RESOURCE SCARCITY
- TECHNOLOGY
- GOVERNANCE
- DEMOGRAPHY
-INEQUALITIES
-HEALTH CHALLENGES
-URBANIZATION
-CONSUMERISM
-EDUCATION

GAP

MEGA TRENDS
- CLIMATE CHANGE
- RESOURCE SCARCITY
- TECHNOLOGY
- GOVERNANCE
- DEMOGRAPHY
- INEQUALITIES
- HEALTH CHALLENGES
- URBANIZATION
- CONSUMERISM
- EDUCATION
- MIGRATION
- EAST-SOUTH INFLUEN.
- NATURE OF WORK
- SECURITY PARADIGM
Some preliminary results

This initial assessment should be followed-up with more in-depth foresight analysis and strategic planning. Some knowledge gaps that can be addressed include:

1. Give more explicit recognition of the crucial role of demand-side dynamics in shaping future food systems.
2. The interlinkages between the trends (urbanisation, growing consumerism, shifting health challenges and the new players and governing systems), raises yet another set of questions that need to be filled urgently
3. The changing food system environment alluded to in the trend assessment, clearly calls for a need to include more and an increasingly diverse set of actors in managing food security transitions
4. We need a much more clearer understanding of how the influence of non-traditional governance systems is influencing the food system
Conclusions

• We cross-analysed drivers that are considered to be key in shaping future food systems vs. megatrends that could have significant influence on the future.

• While some of the key drivers considered in food system analyses fully reflect/coincide/respond to some of the megatrends, other drivers seem to be of less explored /or less of a concern in food system analyses in the context of sustainability, food and nutrition security and resource preservation.

• Deeper analysis of these gaps may bring forward new areas of research for 1) reducing poverty; 2) improving food and nutrition security and 3) improving natural resources and ecosystem services.