Power of visions on digitalisation for food security from farm to grocery and landfill

Need for Transdisciplinary agenda setting for research and innovation

4th European Technology Assessment Conference 6th November 2019, Bratislava
Content

- Digitalisation trends in the agri-food sector
- From trends to experts’ visions
- Different types of knowledge in visions
- Responsible research agenda setting (transdisciplinarity)
- Participatory foresight method CIVISTI: Future Food for Men and Women
- Impact of the visioning

Food waste accounts to 47 million tons in Europe
Assumption: 80% of food waste could be avoided.
Inadequate processing and packaging
Capacity development, availability of raw materials and technologies, and access to modern energy and markets.

Lack of transportation and distribution systems
Capacity for transport, infrastructure and logistics.

Production and harvest waste
Effective planning, contractual agreements and networks for recovery of safe and nutritious food.

Wholesale and retail systems inefficiencies
Adequate planning, management, labelling, and marketing.

Inadequate storage facilities and techniques
Capacity development, access to energy, inputs, investments and market information.

Sustainable food systems provide safe and nutritious food for human consumption and contribute to climate resilience
Food loss measurement and prevention at local, national, regional and global level.

Safe and nutritious food available for human consumption prevented from becoming waste and discard
Informed behaviour, sustainable consumption/production, partnerships.

Production and harvest losses
Sustainable technical, social, economic and environmental practices and training. Coherent investments for short, medium and long term returns.

Food waste and discards along supply chains
Prevent and reduce safe and nutritious food removal from supply chains. Reduced impact on climate change.
Digitalisation trends in the agri-food sector

Technologies for:

• Machine Learning and Analytics
• RFID Sensors and Tracking
• Farming and Robotics
• Drones and Crop Monitoring
• IoT and Sensors in Equipment
• ...

Functions:

• Monitoring
• Transparency and traceability
• Crop protection
• Resource efficiency for circular economy

https://waste4think.eu/
An experts‘ Vision for Food Economy 4.0: Spoilage sensor for the home and store

one third of the food produced in the world is thrown away...this seems like a terrible waste.

Fortunately, new technologies have been developed to help both the retail sector and the consumer to reduce the amount of food waste.
I have benefited from sensors monitoring the spoilage of food and my new mobile phone camera ...

Serious problems of packaging are not mentioned!...
Are experts‘ visions enough?
Different types of knowledge in Visions

- **Normative knowledge**: Values and societal needs change more slowly than technology progresses, which leaves advice created from engaging multiple actor groups based upon citizens’ desirable futures as a socially robust foundation for decisions with a long-term perspective (Gudowsky & Sotoudeh 2017).

- **Emotional and pragmatic knowledge**: Method evades the problems arising from the deficit model of knowledge. For the initial collective visioning activity, citizens do not need to be ‘educated’ in advance to have an informed debate, because their implicit and explicit knowledge, in combination with individual and collaborative space for imagining and discussing, is adequate for setting the normative basis of desirable futures (Gudowsky et al. 2017).

- **Cognitive knowledge**: Transdisciplinary foresight serves well as a starting point to elicit public values and social needs, but further integration with the established forms of scientific knowledge as well as stakeholder engagement is absolutely necessary (Gudowsky & Peissl 2016).
Precautionary principle and participation

Knowledge about Outcomes

- Risk
  - Risk assessment
  - Cost benefit
  - Bayesian models

- Ambiguity
  - Participatory deliberation
  - Stakeholder negotiation
  - Scenario Workshops

- Uncertainty
  - Burden of evidence
  - Uncertainty factors
  - Decision heuristics

- Ignorance or strong Uncertainty
  - Targeted research and horizon scanning
  - Transdisciplinary and institutional learning

Knowledge about Probabilities

Not problematic → Problematic

Not problematic → Problematic
Transdisciplinary agenda setting: Different perspectives

- How to orient R&I towards societal needs, demands and preferences?
  
  **Visioning + Inclusion**
  
  - Fostering creativity and conducting the visioning process in a fair democratic environment can serve as
  - a valid inclusion of laypeople in agenda setting,
  - and therefore increase legitimacy and accountability of research and innovation agendas (Sotoudeh & Gudowsky 2018)
Sotoudeh, Bettin, Gudowsky

Citizens → VISIONS → RECOMMENDATIONS → Experts & Stakeholders → Policy R&D Economy

validated OUTPUT
EU

**CIVISTI** - Citizens’ Visions on Science, Technology and Innovation (2008-2011) FP7 [www.civisti.org](http://www.civisti.org)

**CIMULACT** - Citizen and Multi-Actor Consultation on Horizon 2020 (2015-2018) [www.cimulact.eu](http://www.cimulact.eu)

National

**Future Foods 4 men & women** (2013-2016) AGES, BMVIT, FFG, [www.ages.at/ages/futurefoods](http://www.ages.at/ages/futurefoods)

Regional

**CIVISTI-AAL - Leben 2050** (2013-2014), Stadt Wien [www.leben2050.at](http://www.leben2050.at)

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Sotoudeh, Bettin, Gudowsky
Future Food 4 Men and Women in Austria: Innsbruck, Graz, Linz, Wien (2016)
12 visions within two scenarios

Scenario: Government regulation based on environmental awareness

- Spatial planning for a healthy Austria,
- biodiversity, bee protection
- Green cities
- **Packaging, less waste**
- Regional Citizens’ platform
- Food for healthy nutrition

Scenario: Minimal regulation precise information on the free market

- Nutrigenomics - Personalised nutrition
- **Food Tracker**
- Food infotainment.
- Package leaflet for foodstuffs
- Worldwide, uniform product labelling - "WEP".
- Shopping and cooking assistant
Forthcoming- special issue

Topical Collection:
Participatory agenda setting for research and innovation

European Journal of Futures Research (end of 2019)
https://eujournalfuturesresearch.springeropen.com/pase
References


Thank you for your attention!

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