INSTITUTE OF TECHNOLOGY ASSESSMENT

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

ÖAW AUSTRIAN ACADEMY OF SCIENCES

Mahshid Sotoudeh, Steffen Bettin, Niklas Gudowsky

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.

http://www.fao.org/resources/infographics/infographics-details/en/c/414196/

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://www.forbes.com/sites/danielnewman/2018/05/14/top-six-digital-transformation-trends-in-agriculture/
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.

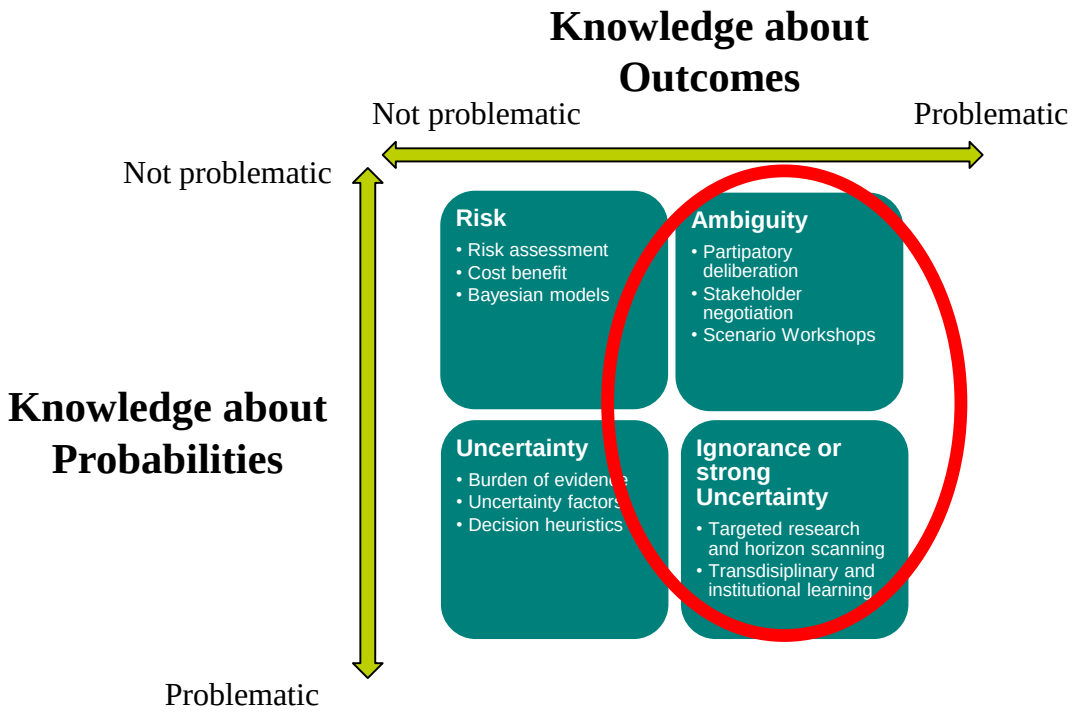
I have benefited from sensors monitoring the spoilage of food and my new mobile phone camera ...

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

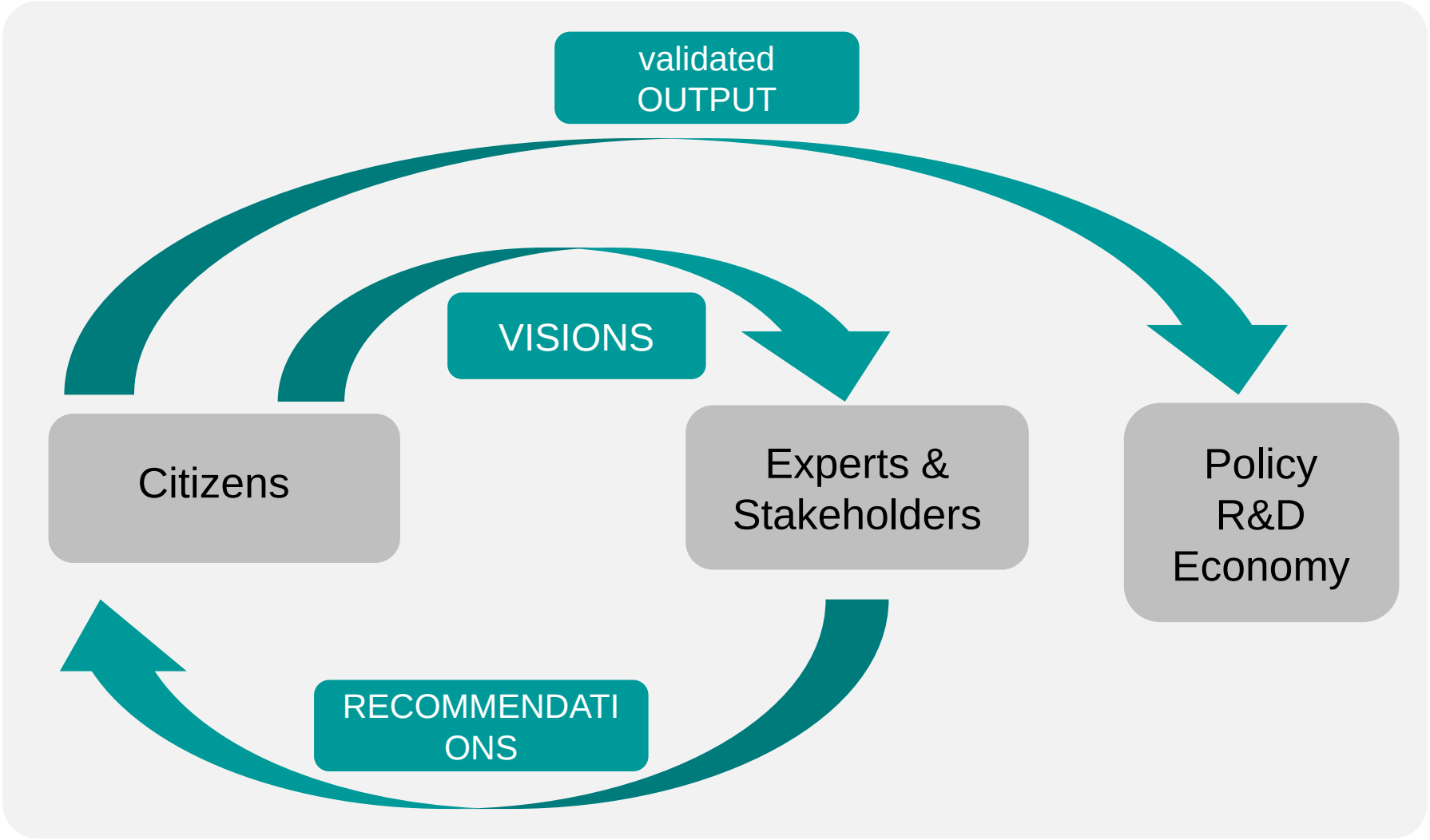


Transdisciplinary agenda setting: Different perspectives

- 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)


validated
OUTPUT
VISIONS
Citizens
Experts &
Stakeholders
Policy
R&D
Economy
RECOMMENDATI
ONS

EU

CIVISTI - Citizens' Visions on Science, Technology and Innovation (2008-2011) FP7 www.civisti.org

CIMULACT - Citizen and Multi-Actor Consultation on Horizon 2020 (2015-2018) www.cimulact.eu

National

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

Regional

CIVISTI-AAL - Leben 2050 (2013-2014), Stadt Wien www.leben2050.at

2008 2010 2012 2014 2016 2018

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

Gudowsky, N., & Rosa, A. (2019). Bridging Epistemologies – Identifying uniqueness of lay and expert knowledge for agenda setting. *Futures, 109*, 24-38. https://doi.org/10.1016/j.futures.2019.04.003

Rosa, A., Gudowsky, N., & Warnke, P. (2018). But do they deliver? Participatory agenda setting on the test bed. *European Journal of Futures Research, 6*(1). doi:10.1186/s40309-018-0143-y

Sotoudeh, M.; Gudowsky, N. (2018) Participatory foresight for technology assessment – Towards an evaluation approach for knowledge co-creation. TATuP – Technikfolgenabschätzung in Theorie und Praxis, Bd. 27 (2), S. 53-59. http://www.tatup.de/index.php/tatup/article/view/135/200

Gudowsky, N., & Sotoudeh, M. (2017). Into Blue Skies—a Transdisciplinary Foresight and Co-creation Method for Adding Robustness to Visioneering. *NanoEthics, 11*(1), 93-106. https://doi.org/10.1007/s11569-017-0284-7

Gudowsky, N., Sotoudeh, M., Capari, L., & Wilfing, H. (2017). Transdisciplinary forward-looking agenda setting for age-friendly, human centered cities. *Futures, 90*, 16-30. https://doi.org/10.1016/j.futures.2017.05.005

De Graaf, B. et al (2017), The Dutch National Research Agenda in Perspective: A Reflection on Research and Science Policy in Practice, Amsterdam University Press, Amsterdam.

OECD (2017), Open research agenda setting, *OECD Science, Technology and Industry Policy Papers*, No. 50, OECD Publishing, Paris, https://doi.org/10.1787/74edb6a8-en.

Gudowsky, N., & Peissl, W. (2016). Human centred science and technology—transdisciplinary foresight and co-creation as tools for active needs-based innovation governance. *European Journal of Futures Research, 4*(1). https://doi.org/10.1007/s40309-016-0090-4

Gudowsky, N.; Peissl, W.; Sotoudeh, M.; Bechtold, U. (2012) Forward-looking activities: incorporating citizens´ visions. Poiesis & Praxis (online first: 15/11/2012). http://dx.doi.org/10.1007/s10202-012-0121-6

Stirling, A., 2017. Precautionary appraisal as a response to risk, uncertainty, ambiguity and ignorance, Routledge Handbook of Ecological Economics. Routledge, pp. 267-277.

Thank you for your attention!

Contact:
PD Dr. Mahshid Sotoudeh
A-1030 Vienna, Apostelgasse 23
Tel: +43 (1) 51581 6590
msotoud@oeaw.ac.at
www.oeaw.ac.at/ita

Dr. Niklas Gudowsky
A-1030 Vienna, Apostelgasse 23
Tel: +43 (1) 51581 6572
niklas.gudowsky@oeaw.ac.at

MSc BSc Steffen Bettin
A-1030 Vienna, Apostelgasse 23
Tel: +43 (1) 51581 6565
steffen.bettin@oeaw.ac.at