ESOF 2018 TOULOUSE

Food and nutrition security and agriculture

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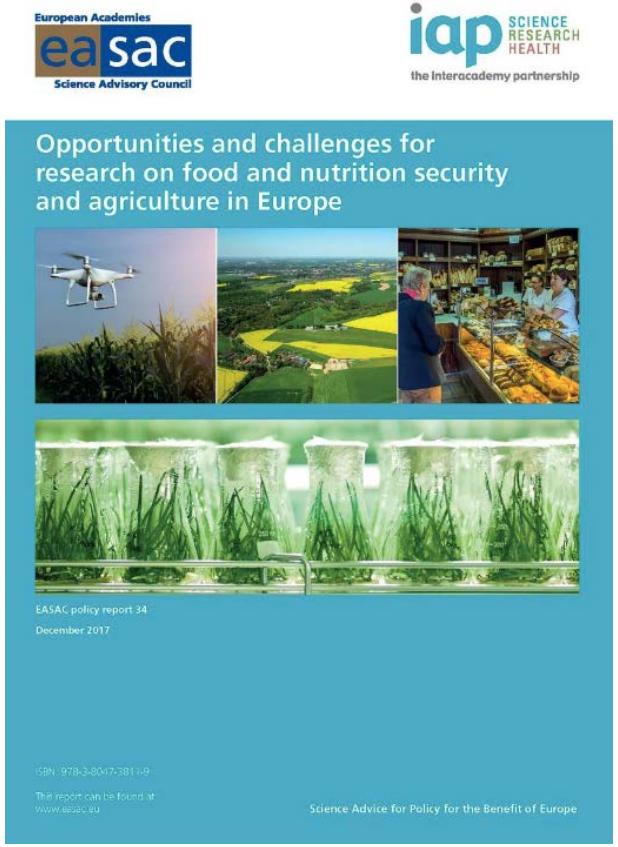
European Academies easac Science Advisory Council



Key Findings of the EASAC-IAP Project on Food and Nutrition Security and Agriculture (FNSA)

Available on https://easac.eu/publications/details/opportunities-and-challenges-for-research-on-food-and-nutrition-security-and-agriculture-in-europe/

Food and Nutrition Security

A sufficient, sustainable, secure supply of safe, nutritious and affordable high-quality food for all, using less land with lower inputs and in the context of global climate change

EASAC-IAP's Approach

1. Food systems' perspective

- Human health; resource use efficiency; resilience; environmental preservation; markets and trade
- Supply and demand (waste; consumption patterns)
- Focus on vulnerable groups
- Diversity of food systems in the EU; country-specific approaches

2. Scientific opportunities

- Resource for innovation; inform policy; identify knowledge gaps; design research agenda
- Multidisciplinary approach
- Innovation: scientific, technological, social and institutional

Key priority areas for recommendations

1. Nutrition, food choices and food safety (Aifric Sullivan)
2. Plants and animals in agriculture
3. Environmental sustainability
4. Waste
5. Trade and markets

(International implications: Tim Benton)

Specific actions for scientific inquiry to generate, use and connect research

2. Plants and animals in agriculture

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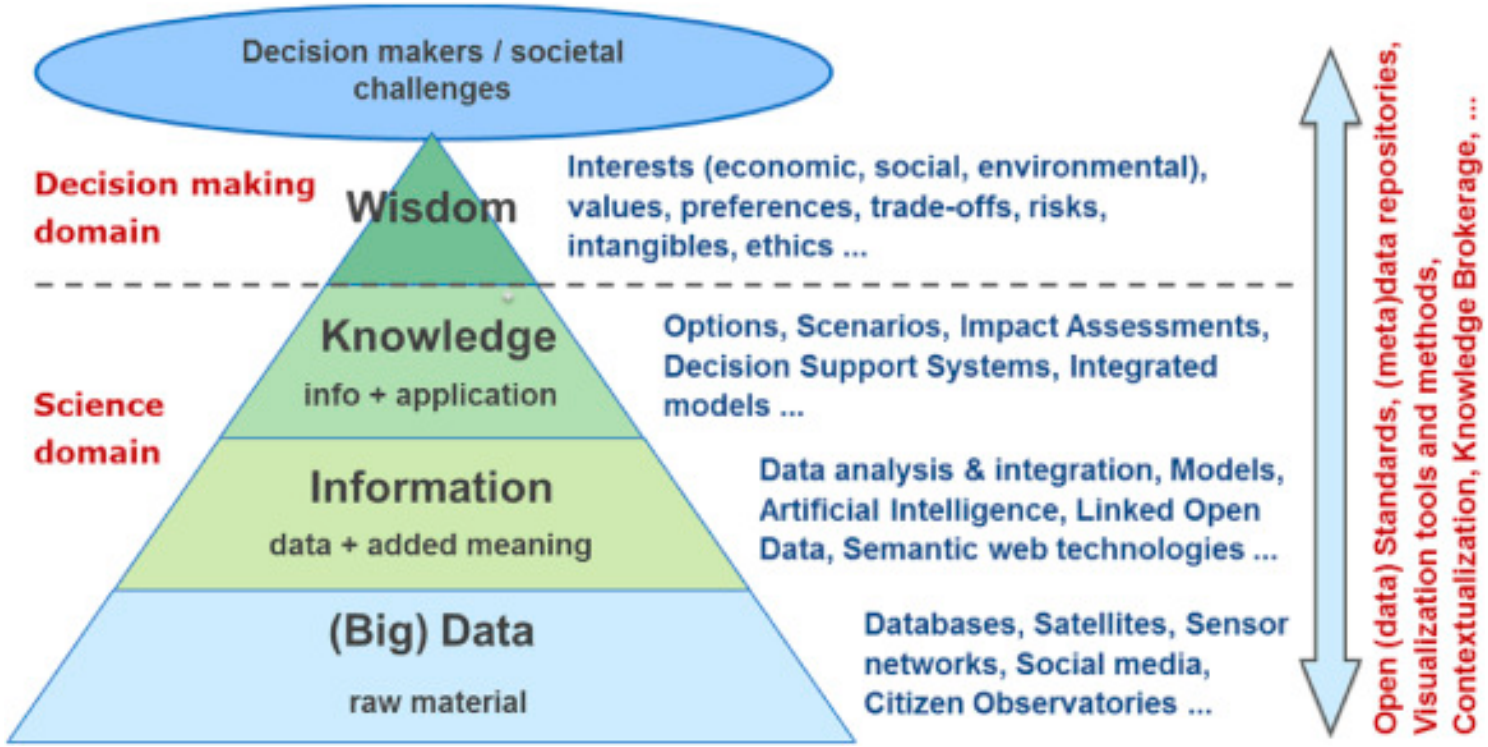
- Increase knowledge base
- New tools (e.g. genome editing; next generation sequencing; genomic selection)
- Develop proportionate evidence-based regulatory policy; assess competing risks
- Conserve wild gene pools and preserve/unveil genetic diversity
- Precision agriculture and big data

2. Plants and animals in agriculture cont.

- Precision agriculture
- ‘Big data’



Hierarchy of data–information–knowledge–wisdom, from big data to decision-making for societal challenges, from Lokers et al. (2016).

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Plants

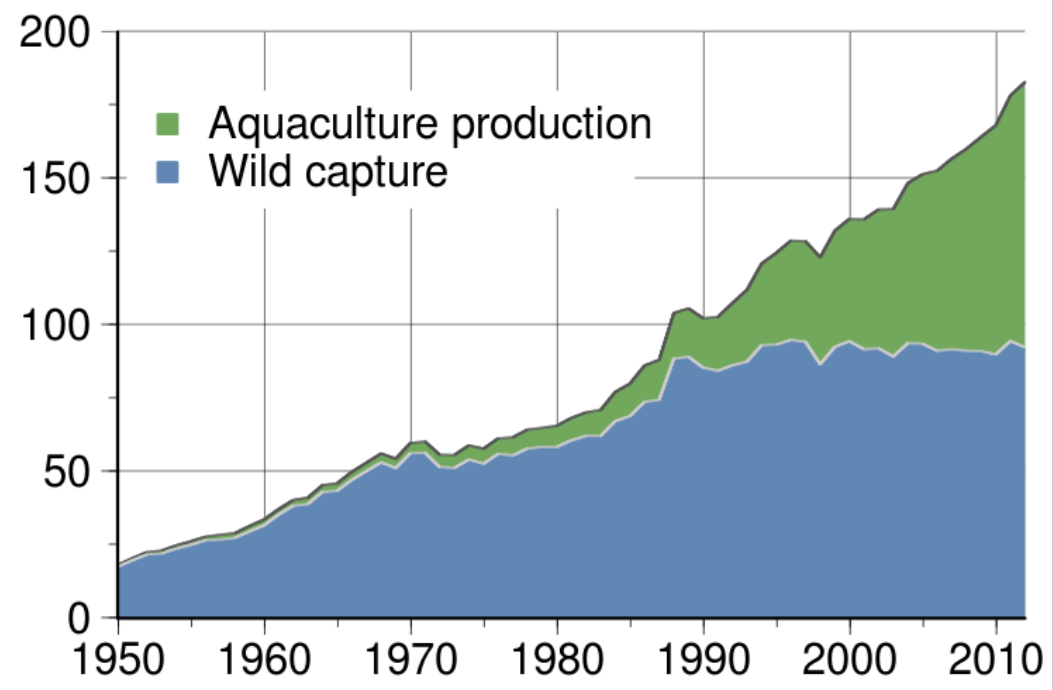
- Comprehensive approach to agric. (improved crop varieties, integrated crop protection, soil and water management, reduction of external inputs)
- Genetics and metabolomics of crop nutritional quality and stress tolerance
- Unrepresented crop species (new domestications?)

Animals

- Health and welfare
- Stress tolerance
- Livestock and GHG emissions

Food and biomass from the sea

- Underutilised as food provider, water not a constraint (increase efficiency)
- Fisheries management (direct to lower trophic levels); biodiversity conservation and marine environmental protection
- Aquaculture



Global total wild fish capture and aquaculture production in millions of tonnes, as reported by the FAO

3. Environmental sustainability

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- Increase resilience of food systems to climate change, and reduce contribution to global warming: climate-smart agriculture
- Multi-disciplinary research to understand food-water-ecosystem services nexus, including effect of extreme weather events
- Develop evidence base for use of land and water for private and public goods
- Biofuels choices: next generation, potential of cellulosic raw materials
- Effect of biomass production on land use and food prices

3. Environmental sustainability cont.

- Synthetic biology; engineered photosynthesis
- Soil sciences: carbon sequestration; soil microbiome (including contribution to the bioeconomy); soil monitoring and management

4. Waste

- Robust data collection on extent of waste in food systems and the effectiveness of interventions to reduce waste at local and regional levels
- Application of food science and technology for food processing and reducing waste
- Inform the intersection between circular economy and bioeconomy policy objectives

5. Trade and markets

- Data collection on trade flows, prices - modelling and analysis of databases
- Linkages between extreme events and price volatility
- Effects of regulatory policy instruments in agric. markets
- Understanding fair trade systems

THANK YOU

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