RESEARCH TO REALITY

DIGITAL SOLUTIONS TO EUROPEAN CHALLENGES

Session
“Bridging gaps in digitalisation of agri-food : From R&I to viable applications”

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Digitalisation and innovation in and for agriculture – Relevance of European policies and programmes

Dr. Doris MARQUARDT
Directorate-General for Communications Network, Content and Technology, Unit E4

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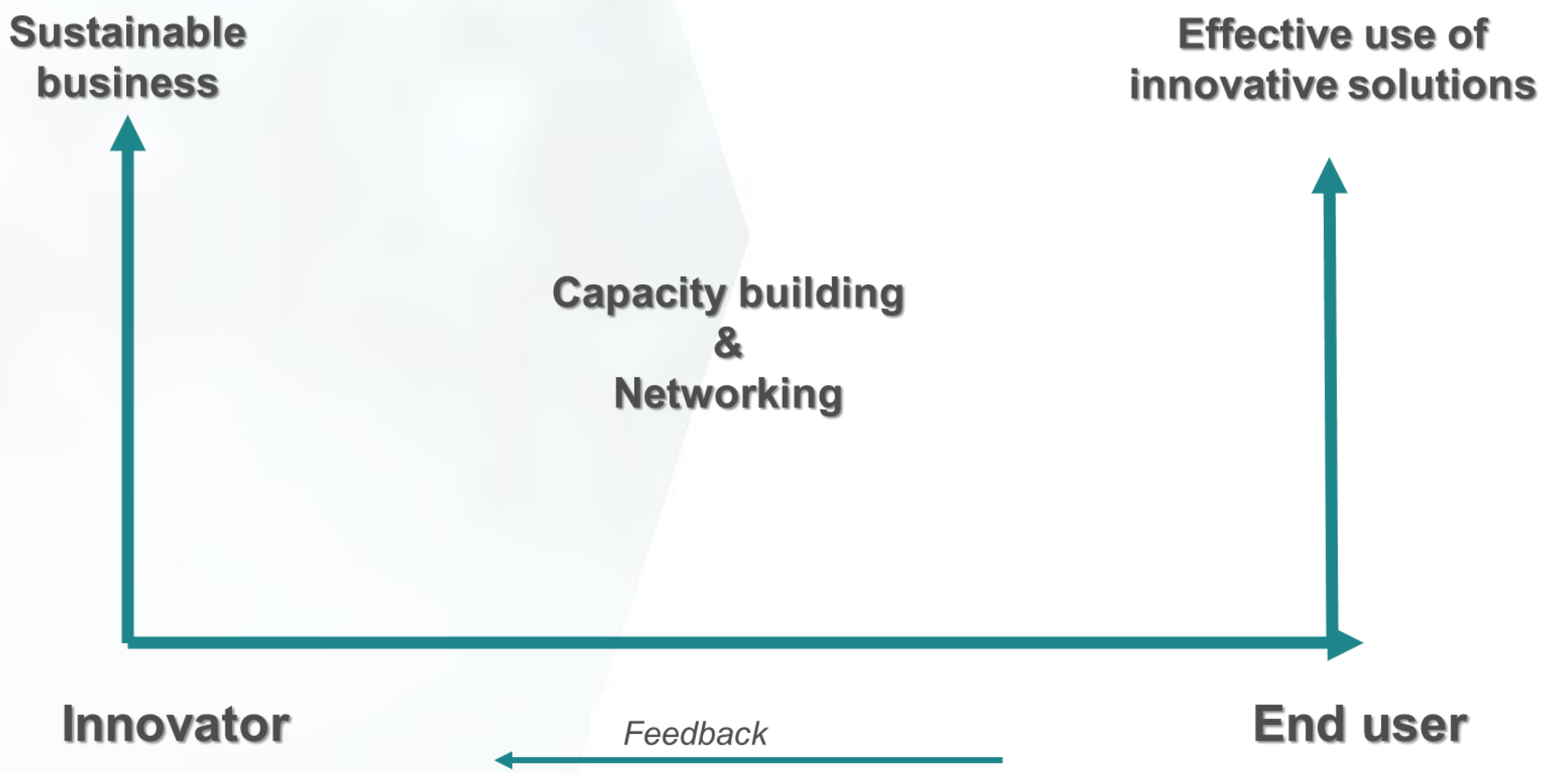
Furthering innovation and its effective uptake



Policy ambitions

- GREEN DEAL
- DIGTIAL AGE
- BETTER REGULATION
- VIBRANT INNOVATION ECOSYSTEM
- RESILIENT and COMPETETIVE AGRICULTURAL SECTOR
- VIBRANT RURAL AREAS

Contribution to the Green and Digital transformation for resilient food system and rural areas

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Complementarity between programmes with support in the field of digital

EU-wide collective effort					Shared management			Financial instrument
Horizon Europe	Digital Europe	CEF	Creative Europe	Health	Cohesion	Agriculture Funds	RRF	InvestEU
Research Innovation	Strategic capacities: computing, data, testbeds, etc. Advanced digital skills EU-wide deployment							…

Interplay between Horizon Clusters and DEP

Cluster 4

Basic horizontal research on digital and data technologies relevant for all sectors/ several fields of application

Cluster 6

Addressing sector-/area specific needs with digital- and data technologies

Possible: Uptake of Cluster 4 results to be adapted to specific context

DEP

Scaling up of R&I results close to market/ fostering end-user-uptake and deployment (high level of maturity)

Example: Research **on** AI in Cluster 4, Research **with** AI in Cluster 6, Testing of and/ or, Providing **assets/ infrastructure for AI-based** innovation under DEP

Horizon Europe Strategic Plan 2021-2024

(…) R&I will be a key driver in accelerating the transition to ***sustainable, low ecological footprint, healthy and inclusive food systems*** *– from primary production to consumption. Farmers and primary producers will be empowered to manage land, animal resources, soil, water and nutrients* ***in sustainable ways*** *[…] Efforts to boost* ***digitalisation*** *[…] will foster the development of tailored* ***digital technology****-based solutions enabling* ***sustainability and transparency****, as well as* ***enhance data generation capacities*** *and enhance* ***databases*** *increasing their effectiveness. (…)*

2021

- **Smart XG, last-mile and edge solutions** for remote farming, forestry and rural areas
- Research & innovation roadmap for **blockchain technologies in the agri-food sector**
- **Potential of drones as multi-purpose vehicle – risks and added values**
- **Assessing the impacts of digital technologies in agriculture – cost, benefits and potential for sustainability gains**
- Development of the markets and use of digital technologies and infrastructure in agriculture – state of play and foresight: digital and data technologies for the agricultural sector in a fast changing regulatory, trade and technical environment
- **Data economy in the field of agriculture – effects of data sharing and big data**

2022

- **Smart solutions for the use of digital technologies for small- and medium-sized, farms and farm structures**
- **Upscaling (real-time) sensor data for EU-wide monitoring of production and agri- environmental conditions**

Work Programme 2023/24

Looking ahead …

- Next Strategic Plan

- Next Work Programme

→ ***Under preparation following a participatory co-creation process***

Digital Europe Programme

- **“New programme”**
- **First work programme published in November 2021; amendment of second work programme published in December 2023**
- **Measures particularly relevant to boost digitalisation in agri-food areas:**
- Common European Agricultural Data Space
- Testing and Experimentation facilities for AI in agri-food
- European Digital Innovation Hubs
- Support to advanced digital skills

Interplay of key actions - Examples

RESEARCH → **INNOVATION** → **DEPLOYMENT**

Horizon Partnership AgData

COMMON EUROPEAN AGRICULTURAL DATASPACE

AGRI DATASPACE

TEF agrifood

HORIZON PROJECTS → **DIGTAL INNOVATION HUBS**

Legend

- Inform/Scale up
- Scale up

Note, no data flows are registered in this figure

Image reference: Ministry of Saxony, Germany

… meets socio-economic (including cultural), environ-mental, technological, and legal reality …

The role of EDIHs and the EIP-AGRI

An interactive approach towards innovation in agriculture – two instruments in support of social innovation to develop innovative technological solutions – **European Digital Innovation Hubs (EDIHs)** and the **European Innovation Partnership Agriculture & Sustainability (EIP-AGRI).**

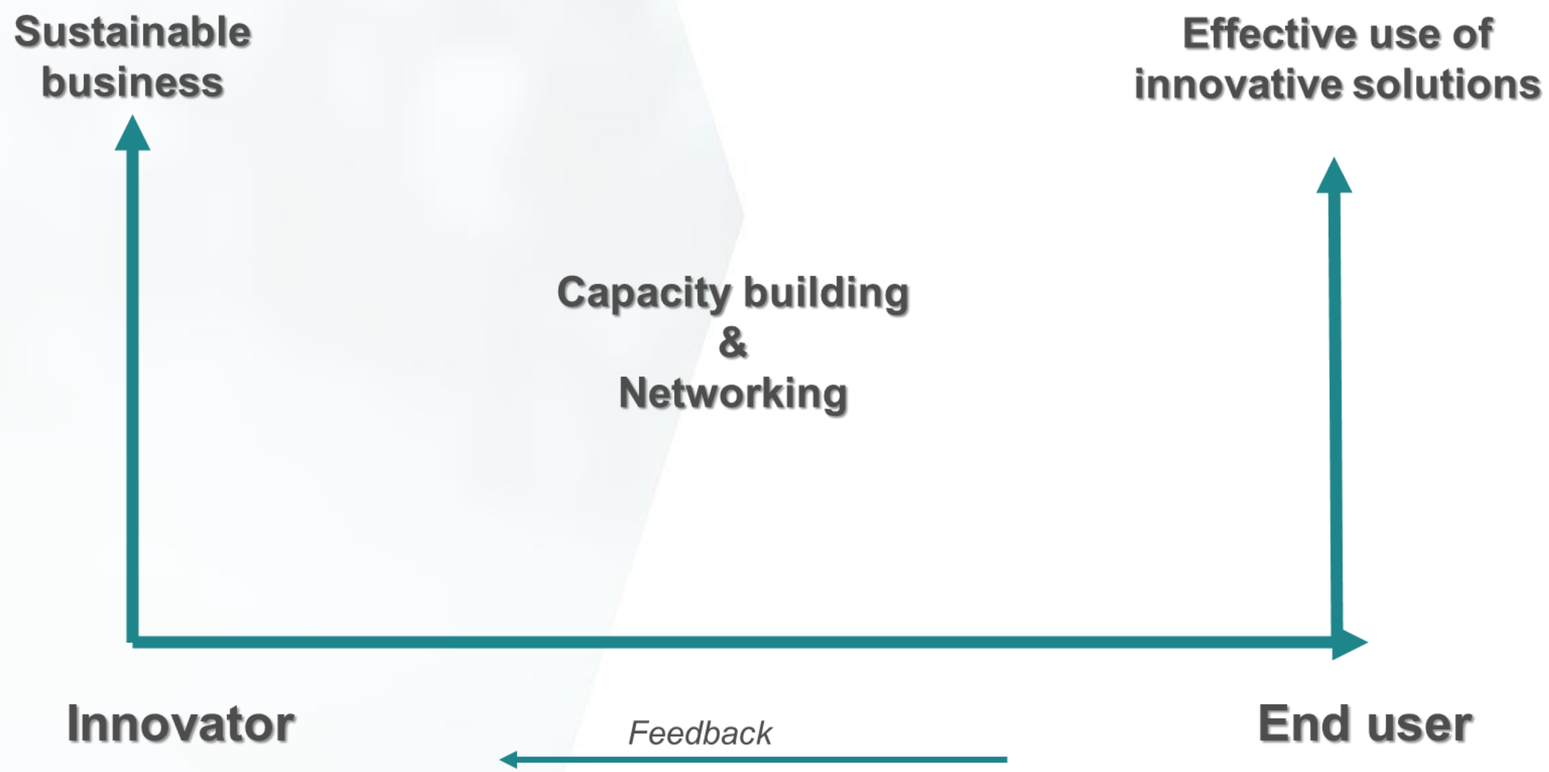
Innovator

Farmer

Complementarity of EU programmes – Examples: Innovation & Digital technologies in agriculture

Policy instrument/ Programme	Scope	Examples	Comments
Horizon Europe	**Research & Innovation**	**Dedicated calls** **Partnership Agriculture of Data**	Under Horizon Europe, especially Clusters 6 and 4 are relevant
Digital Europe Programme	**Innovation & Deployment** Capacity building	**Common European Agricultural Data Space** **European Digital Innovation Hubs** **Testing and Experimentation Facilities for AI** **Advanced digital skills**	Network of EDIHs expected to establish links to network of European Innovation Partnership Agriculture & Sustainability (EIP-AGRI)
Common Agricultural Policy	**Application** Capacity building Innovation	Advisory services Training Investment support Agricultural Knowledge and Innovation System (AKIS) EIP AGRI	Link to Horizon Europe through EIP-AGRI

Furthering innovation and its effective uptake



Concluding remarks

- **Private and public interests, resources, and data** are to be considered to boost digital innovation in agri-food; **market gaps hampering the achievement of policy ambitions**, such as achieving sustainability gains, efficiency gains, and the reduction of administrative burdens, are to be addressed.
- **Key instruments, including under Digital Europe, Horizon Europe, and legislation**, to exploit the potential of innovation, digital and data technologies in the agri-food sector have been launched; in programming, **links between "agriculture" and "food" can still be increased**.
- **Assets for scaling digital innovations in agri-food include systemic actions in the field of data and data sharing, capacity building, awareness raising, and establishing trust**.
- Jointly shaping a **diverse and balanced innovation ecosystem and using its potential for the agri-food sector**, requires an active science-policy interface, involvement of the sector (e.g., end users and advisors) and industry, as well as considering socio-economic, environmental, and legal framing conditions.
- This session will generate important input for the **programming cycles of Digital Europe and Horizon Europe.**

Thank you!

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Bridging gaps in digitalisation of agri-food : From R&I to viable applications

Achieving sustainability gains with added value for the sector through tailored digital innovation

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Data Technology Challenges for Implementing the EU Twin Transition in Reality

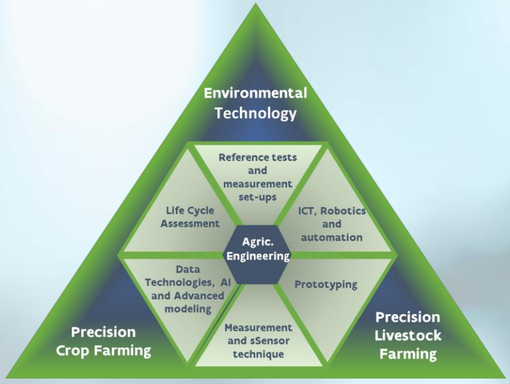
- Availability of Qualitative Data
- Agribusiness Market Power Imbalance
- Semantic Interoperability
- Technology adoption
- Real Life Testing Facilities
- Trust!

Jürgen Vangeyte ILVO

INTERDISCIPLINARY COMPETENCE CENTER

Continuous Learning

Key Focus research Areas



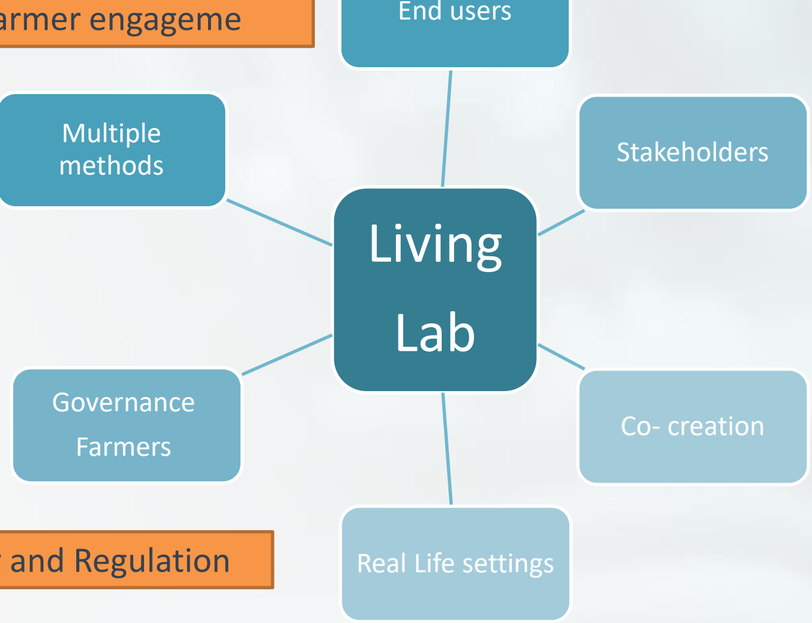
END USER DRIVEN

NETWORK DRIVEN

EU Collaborative Partnerships

Real Life Settings & farmer engageme

Knowledge Transfer



USE CASE DRIVEN

Policy and Regulation

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DIGITAL INNOVATION HUB
One stop shop

Innovation Ecosystem

Multi country data space

COMMON EUROPEAN AGRICULTURAL DATASPACE

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Envisioning the Future - The Significance of Innovation in Agriculture and Our Path Ahead

Grigoris Chatzikostas
Foodscale Hub

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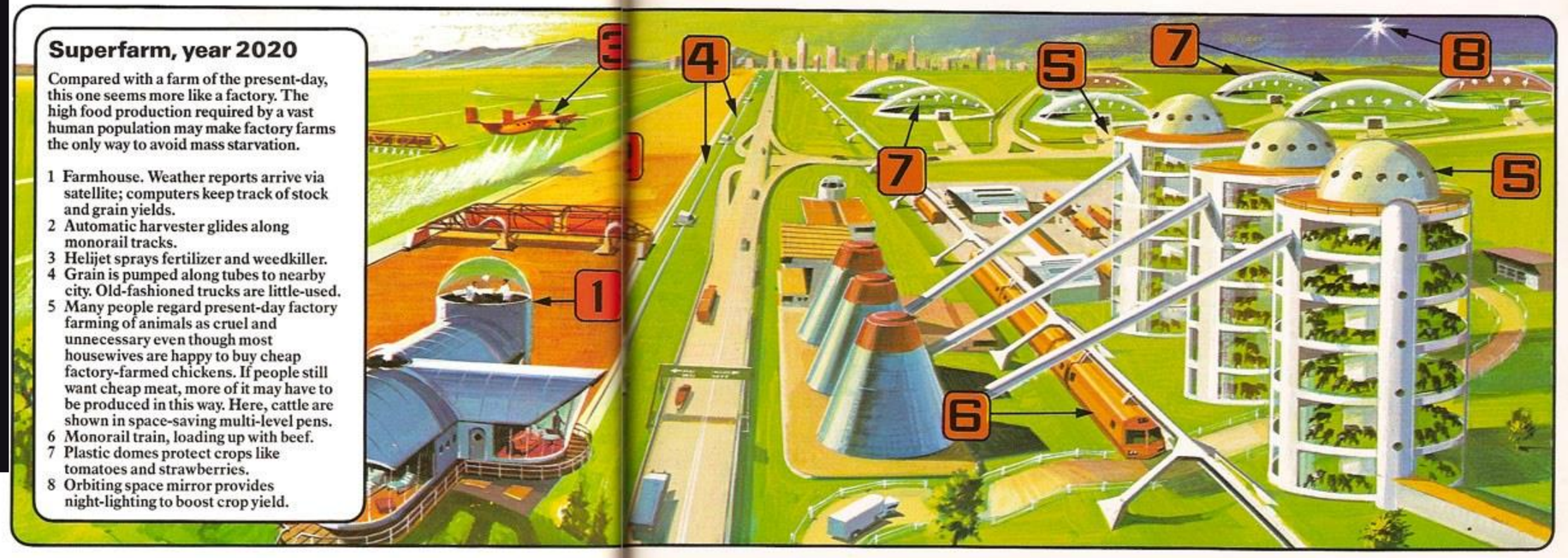
Superfarm, year 2020

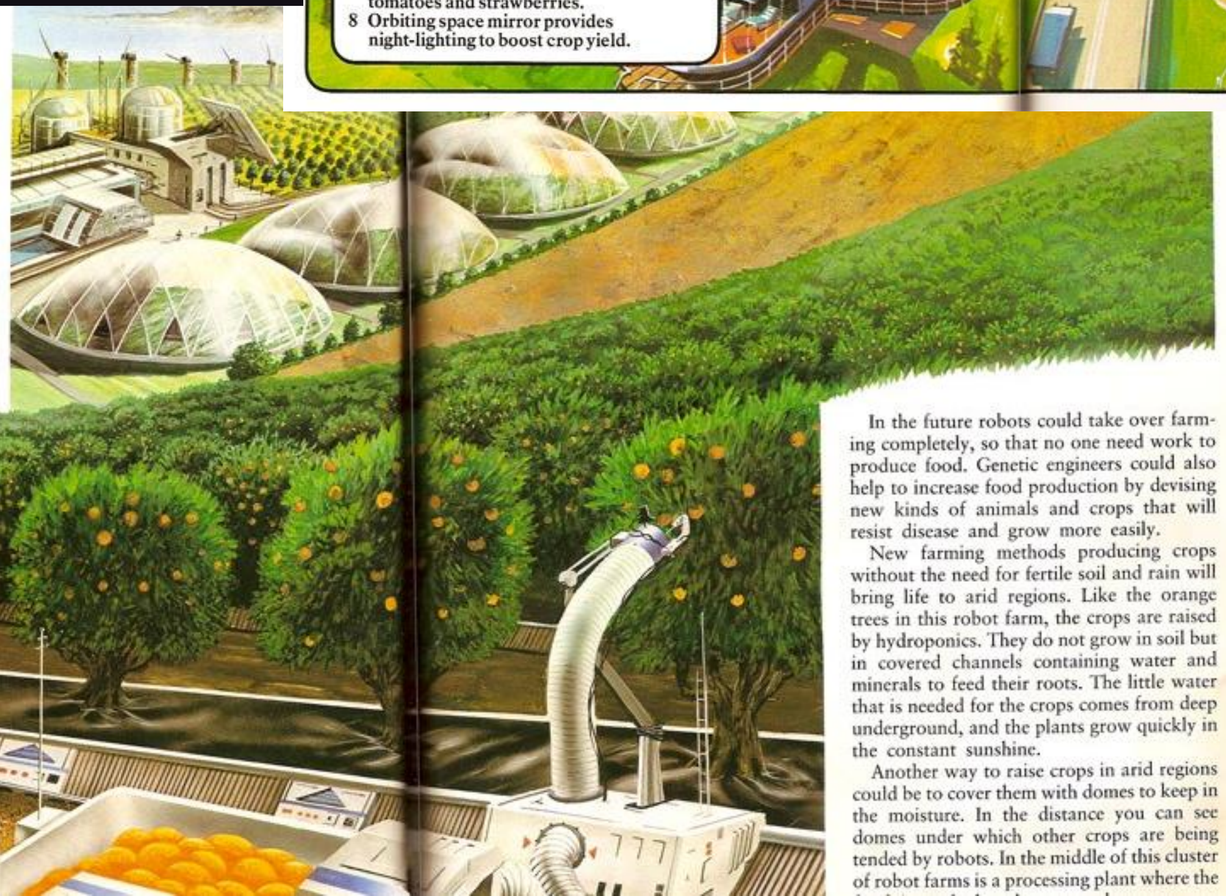
Compared with a farm of the present-day, this one seems more like a factory. The high food production required by a vast human population may make factory farms the only way to avoid mass starvation.

1 Farmhouse. Weather reports arrive via satellite; computers keep track of stock and grain yields.
2 Automatic harvester glides along monorail tracks.
3 Helijet sprays fertilizer and weedkiller.
4 Grain is pumped along tubes to nearby city. Old-fashioned trucks are little-used.
5 Many people regard present-day factory farming of animals as cruel and unnecessary even though most housewives are happy to buy cheap factory-farmed chickens. If people still want cheap meat, more of it may have to be produced in this way. Here, cattle are shown in space-saving multi-level pens.
6 Monorail train, loading up with beef.
7 Plastic domes protect crops like tomatoes and strawberries.
8 Orbiting space mirror provides night-lighting to boost crop yield.



from a farm of today. The first, of course, is that robots are picking the oranges. The second is that the orange trees are not growing in any soil. Now look at the landscape to spot the third difference. The farm is situated in an arid region where little rain falls from the sky. Today, such regions are virtually uninhabited and useless. These three differences show how robot farms of the future will be able to produce more food for the world's people than farming can today.

Farms are places where machines have been put to work more and more over the years. Today all the food in the more developed nations of the world is produced by only a small part of the population – because the farmers are using machines to help them.



In the future robots could take over farming completely, so that no one need work to produce food. Genetic engineers could also help to increase food production by devising new kinds of animals and crops that will resist disease and grow more easily.

New farming methods producing crops without the need for fertile soil and rain will bring life to arid regions. Like the orange trees in this robot farm, the crops are raised by hydroponics. They do not grow in soil but in covered channels containing water and minerals to feed their roots. The little water that is needed for the crops comes from deep underground, and the plants grow quickly in the constant sunshine.

Another way to raise crops in arid regions could be to cover them with domes to keep in the moisture. In the distance you can see domes under which other crops are being tended by robots. In the middle of this cluster of robot farms is a processing plant where the

- Reality in 2024 is different from what we thought it would be back in the 80s.
- **Our food system is broken**: True **cost is 3 times higher, than expenditure on food.** Neither farmers, nor citizens are happy on how it works; and **this costs ~13 Trillion Euros annually** (UN)

Current challenges

- Demand for more /healthier food
- Insufficient agricultural land/ low investments
- Climate Change/ Biodiversity loss

Business value of Innovation

- Efficiency
- Cost-effectiveness
- Market competitiveness
- Compliance with env. standards

Promising technologies

- Artificial Intelligence
- Blockchain
- Robotics
- Digital Twins
- High Performance Computing
- ….(and many more to come)

Agents of change

- Citizens/ consumers
- Young/ organic farmers
- Startup community (hackers, makers, open-source enthusiasts)

What will define the future?

- Will traditional production models survive?
- Global collaboration or silos?
- Who is driving the transformation

Thank you for your attention

g@foodscalehub.com

Grigoris Chatzikostas

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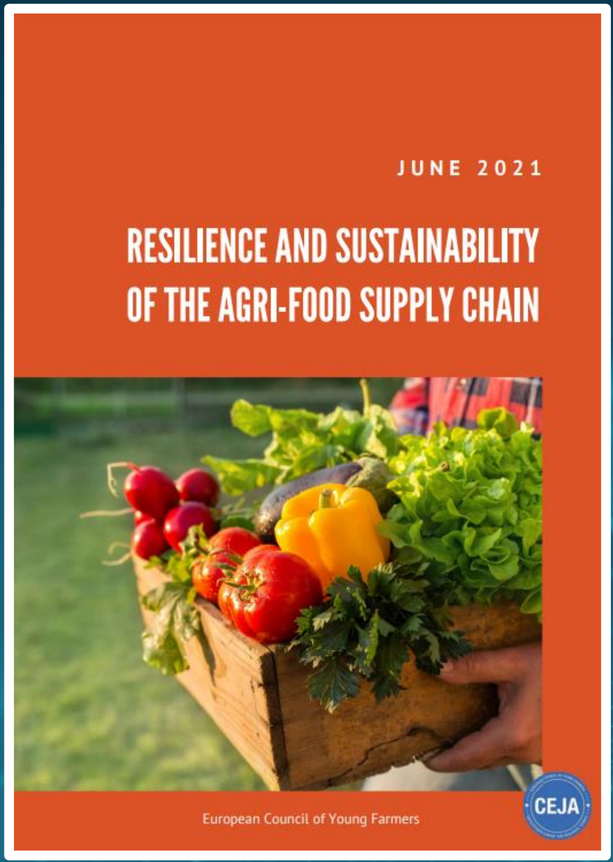
6,5%

of farmers **below the age of 35 years old** in 2020 (Eurostat).

11,9% under the age of 40.



Attractiveness

of rural areas & farming

72%

of farmers are still **relying solely on practical experience** on the farm *(Eurostat, 2020)*

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DEVELOPPING THE RIGHT KNOWLEDGE AND SKILLS

USING THE RIGHT TECHNIQUES, TECHNOLOGIES, & STRATEGIES

FINANCING & BUSINESS PLAN COMPATIBILITY

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