EURAGRI Conference 2022

"European Food Systems' Innovation for Resilience - the short and long-term challenges"

BIOEAST Thematic Food Systems STRATEGIC RESEARCH AND INNOVATION AGENDA

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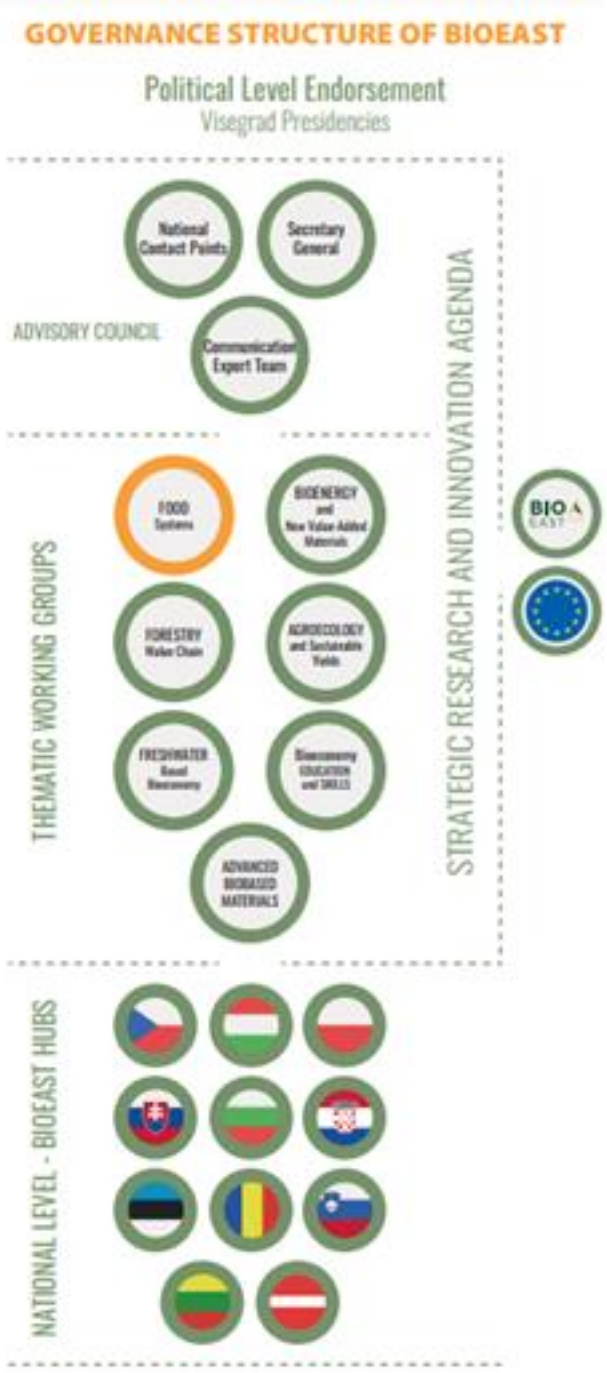
This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 862699



- Central-Eastern European Initiative for Knowledge-based Agriculture, Aquaculture and Forestry in the Bioeconomy – **BIOEAST initative**
- **11 countries** involved: PL, HU, SK, SV, CZ, LV, LT, EE, RO, BG, HR
- BIOEAST Food Systems Thematic Working Group (TWG) is **coordinated by the Ministry of Agriculture and Rural Development of Poland** together with research institututions

BIOEAST TWG Food Systems

Country	Institution	Role
POLAND		
Paweł Chmieliński	Institute of Rural and Agricultural Development Polish Academy of Sciences	Chair
Justyna Cieślikowska	Ministry of Agriculture of Poland	Coordinator
Adam Wasilewski	Institute of Agricultural and Food Economics National Research Institute	Co-Chair
HUNGARY		
Róbert Kocsis	Hungarian Dairy Experimental Institute	Member
Zoltán Kovács	Szent István University Faculty of Food Science Science	Member
Andrea Győrffy	Hungarian Chamber of Agriculture	Member
Péter Penksza	Directorate of Food Industry, Hungarian Chamber of Agriculture	Member
Viktória Szűcs	Hungarian Chamber of Agriculture	Member
Eszter Takács	Research Institute of Agricultural Economics AKI	Memebrs
CZECH REPUBLIC		
Svetlana Malyugina	Research Institute for Cattle Breeding	Member
Jana Hajšlová	Institute of Chemical Technology	Member
Slavomíra Vavreinová	Czech Academy of Agricultural Sciences	Member
Petr Roubal	Dairy research institute	Member
SLOVAKIA		
Martin Polovka	NPPC – Food Science Institute	Member
Danka Moravčíková	Slovak University of Agriculture in Nitra	Member
SLOVENIA		
Tadeja Kvas Majer	Ministry of Agriculture, Forestry and Food	Member
Gasan Črnivec Ilja Osojnik	Biotechnical Faculty - University of Ljubljana	Member

BIOEAST TWG Food Systems

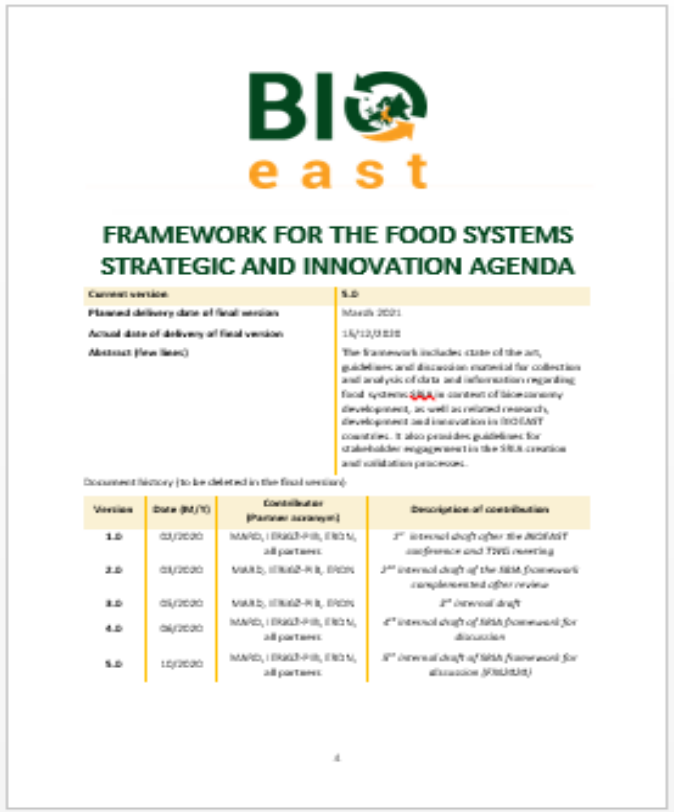
Country	Institution	Role
BULGARIA		
Iliana Nacheva	Institute of Cryobiology and Food Technology - Sofia, Agricultural Academy to the Bulgarian Ministry of Agriculture, Food and Forestry	Member
Teodora Georgieva	Bulgarian Food Safety Agency	Member
ESTONIA		
Siret Talve	Ministry or Rural Affairs	Member
Ants-Hannes Viira	Estonian University of Life Sciences	Member
ROMANIA		
Maria Anghel	Ministry of Agriculture and Rural Development	Member Member
LITHUANIA		
Loreta Bašinskienė	Kaunas University of Technology	Member
Alvija Šalaševičienė	Kaunas University of Technology	Member
Loreta Mačytė	Ministry of Agriculture	Member
LATVIA		
Anita Blija	Latvia University of Life Sciences and Technologies	Member
CROATIA		
Karin Kovacevic Ganic	University of Zagreb, Faculty of Food Technology and Biotechnology	Member
Ksenia Markov	University of Zagreb, Faculty of Food Technology and Biotechnology	Member
Anet Režek Jambrek	University of Zagreb, Faculty of Food Technology and Biotechnology	Member
Martina Jurkovic	Croatian Agency for Agriculture and Food	Member

BIOEAST TWG FOOD SYSTEMS

- provide **strategic advice and support FS research and innovation activities ,** including the advice to the BIOEAST Strategic Research and Innovation Agenda
- **mapping the research and innovation activities** that address systemic approach to accelerate the impact transition pathways to sustainable and healthy food systems.
- generate **discussions and develop a bottom-up stakeholder driven approach** for defining synergies and complementarities between the agricultural sectors and food systems of BIOEAST countries
- **mobilise partners** (CEE Member States, private sector) and **provide access to expert networks in CEECs**, mobilize resources beyond Horizon Europe to implement the European Commission's (EC) R&I policy framework on food systems of the future, including EU Partnership on Food Systems.

BIOEAST TWG Food Systems

- We prepare BIOEAST common **Strategic Research and Innovation Agenda on Food Systems**. This shall provide added value to BIOEAST SRIA and help to set the long-term action plan for research and innovation in BIOEAST. Food systems **thematic SRIA development**: Drafting topics (2020), Mapping challenges and collecting data (2020-2021), Setting a topic for Thematic study (2021), Final (2022).
- Actively represent the CEE (Central Eastern European) countries in **debates on EU Research and Innovation (R&I) policy framework FOOD 2030**.
- **BIOEAST input to the EU Work Programme** 2021-22 2023-24 for cluster 6 of Horizon Europe 'Safe and Sustainable Food System for People, Planet and Climate'
- Actively **link the BIOEAST FS TWG and the SCAR Food Systems Strategic Working Group** (reports, workshops and preparatoryu activities). Active **promotion of the TWG and collaboration with SCAR FS SWG** (meetings) and other events (BIW 2021)



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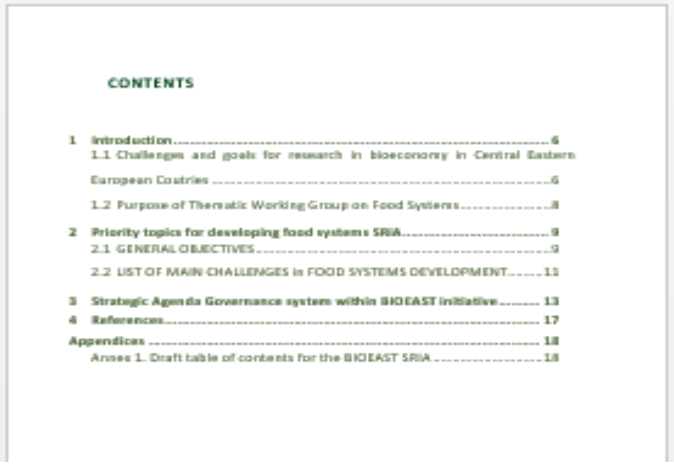
FRAMEWORK FOR THE FOOD SYSTEMS STRATEGIC AND INNOVATION AGENDA

Current version	5.0
Planned delivery date of final version	March 2021
Actual date of delivery of final version	15/12/2020
Abstract (few lines)	The framework includes: state of the art, guidelines and discussion material for collection and analysis of data and information regarding food systems SRIA in context of bioeconomy development, as well as related research, development and innovation in BIOEAST countries. It also provides guidelines for stakeholder engagement in the SRIA creation and validation processes.

Document history (to be deleted in the final version):

Version	Date (M/Y)	Contributor (Partner acronym)	Description of contribution
1.0	03/2020	MARD, IERAS-PIB, IERAS, all partners	1st internal draft after the BIOEAST conference and TWG meeting
2.0	03/2020	MARD, IERAS-PIB, IERAS	2nd internal draft of the SRIA framework complemented after review
3.0	05/2020	MARD, IERAS-PIB, IERAS	3rd internal draft
4.0	06/2020	MARD, IERAS-PIB, IERAS, all partners	4th internal draft of SRIA framework for discussion
5.0	12/2020	MARD, IERAS-PIB, IERAS, all partners	5th internal draft of SRIA framework for discussion (FINISHED)



CONTENTS

Core Theme:
Food Systems

Strategic Thematic Areas:

1. Sustainable Food Production (PRODUCTION)
2. Power and information in the food system: strengthen the food environments and vulnerable actors in the food chains (FOOD CHAINS)
3. Research, innovation, technology and investments for future sustainable food systems (RESEARCH)
4. Promoting sustainable food consumption and the shift to healthy, sustainable diets (CONSUMER)

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Challenges (C):

C1.1: Relatively **low level of knowledge and technology transfer** to primary producers compared to other European regions

C1.2: Traditional agricultural model based on increased use of chemical fertilisers

C1.3: Need for **new management system for biomass collection** and processing from primary producers

C1.4: The **limited sources for sustainable transport and reusable packaging** (avoiding non-renewable and fossil-derived plastics), optimising the preservation of nutritional quality in primary production, ensuring food safety

C1.5: New requirements about **technical definitions, classification, presentation, marking and labelling**, packaging, production method, conservation, storage, transport related administrative documents, certifications and time limits, restriction of use and disposal

C1.6: Crop safety in the context of sustainable use and utilization of **plant protection products**.

C1.7: Increasing the **share of organic and less intensive farming** in the agricultural production and land use systems

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Main research topics:

RT 1.1: Ensuring sustainable food production by human and financial investment – innovation, skills and technology shift

RT 1.2: Stimulating reduction of use and risk and dependency on pesticides

RT 1.3: Promoting measures for reducing biomass loss and waste in production

RT 1.4: Optimization of harvest for the applied processing technologies to reduce food waste, finding the best use of the raw materials and by-products

RT 1.5: Bring to the practice the state-of-the-art of the preservation technologies (with special emphasis to the environmentally friendly packaging, storage conditions etc.) to extend storability of raw materials and the shelf life of final products

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Expected outcome and impact

- **Increased investment in supporting farms** of all sizes to take advantage of new technologies, vision and information flows
- Assess **on-farm practices and equipment to use feedstuffs more efficiently** (post-harvest technologies, crops mixture, foraging strategies, rangeland management)
- **Optimisation of production techniques**, raw material storage, transport and the creation of semi-finished products at primary producer level
- **Optimal use of biomass** based on market knowledge to maximise sustainability and zero-emission and loss-free production
- A significant shift away from the use of pesticides and towards alternative agricultural inputs
- Increasing **the awareness of producers and consumers**, sense of shared responsibility.
- Increased **knowledge on pro-health additives** for feed containing active plant ingredients, a safe alternative to antibiotic growth stimulators in animal nutrition and foreign products.
- **Involvement of owners and managers of medium, large and very large farms** in the conversion process.
- **Limitation of losses of biomass** during agricultural production.
- Increased **use of biomass raw materials and residues**.
- Pesticides consumption reduction. **Sustainable food production**, with less chemical use and less waste. Implementing and using the opportunities offered by digitalisation and automation in the food industry, agri- and horticulture sectors.
- **Improved labour productivity** though innovation, digitalisation and eco-efficiency

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Challenges (C):

C2.1: Lack of systemic approach to boost the innovation and investment in short food chains and related new business models

C2.2: Integration of renewable energy sources and energy efficiency in farming practice, agro-food systems and logistics (transportation, storage).

C2.3: A strong **deficit in trust**, joint action both in horizontal and vertical collective actions by Future Horizon Europe calls

C2.4: Reducing **dependence on non-renewable, unsustainable resources** whether sourced domestically or from abroad

C2.5: Innovations on digitalisation (automation and artificial intelligence) in agriculture, **digital development of agri-food value chain**s (productivity, efficiency, traceability). To strengthen the food environments is the proper connection of producers and consumers, supporting the digitalization of primary producers, developing fast and easy tool for the detection of food frauds and providing information hubs in order to help personalize producers (blockchains)

C2.6: A lack of data on food fraud in the food supply chain

C2.7: Strengthening the **bargaining position of farmers** and increasing their share in creating environment and economic added value in food supply chains, including their shortening.

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Main research topics:

RT 2.1: Promoting sustainable food chains, initiatives and new green business models in food processing, wholesale, retail and food services

RT 2.2: Cooperation of primary producers to support their position in the food chain and non-legislative initiatives to improve transparency

RT 2.3: Tackling with food fraud along the food supply chain

RT 2.4: Development of information hubs to connect farmers and primary producers with potential customers to promote the formation and consolidation of sustainable short food chains

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Expected outcome and impact

- R&D&I projects shall propose **tailor-made, adaptable regulatory or control solutions for decision makers**
- **cooperation models between farmers**, collaboration models for consumers, farmers and intermediaries (like food hub managers, facilitators, chefs) shall be analysed and adapted according to the regional circumstances
- **Influence Horizon Europe to have a special focus on collaborative actions in the CEE countries** where there is a strong deficit in trust, joint action both in horizontal and vertical collective actions.
- A **deeper knowledge to the actors of food chains** of techniques and methods on how to shorten food supply chains. Establishing production and purchasing and sales cooperatives would give a proper surface for communication and connection of primary producers, farmers and consumers directly.
- **Full information to consumers** that the food products they purchase are healthy, nutritious and meet all the necessary requirements, and how they can be protected from frauds
- **Exchange of information** will be achieved which is expected to help producers to understand consumers and to help consumers build trust towards local producers
- **Increased farm incomes**, promote sustainable farming systems and contribute to **local economic development within SFSCs**
- New **innovative and digitized food chain model**, beneficial for the environment and climate, as well as for the main participants, especially farmers and consumers

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Challenges (C):

C3.1: Lack of **data gathering for food systems** by agricultural census

C3.2: Modelling food system dynamics and risk management with multilevel territorial appeach.

C3.3: Increasing of the **crop yield using biological method**, with reduction of the chemicals used in the agriculture.

C3.4: Mapping the available database which can supply reliable data and evidence-based results **for further decision-making processes**

C3.5: Involving players from the food chain to the researches related to the Farm to Fork Strategy

C3.6: Lack of modern educational framework on sustainable food use and transition to sustainable food systems

C3.7: The monitoring of Antimicrobial resistance AMR in zoonotic and commensal bacteria both **in the environment and in food products** is a pre-requisite for understanding the development and diffusion of resistance, providing relevant risk assessment data, and evaluating targeted interventions.

C3.8: Increasing the efficiency of the **biological methods of control against the plant pest**.

C3.9: Stimulating the **growth, plant defence system and biodiversity** in agriculture by using the biological methods.

C3.10: Research on the **social, poverty and demographic problems** related to food systems

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Main research topics:

RT 3.1: Environmental, biodiversity and natural capital observation (new statistics)

RT 3.2: Food system dynamics modelling & risk management at local level

RT 3.3: Future advisory services, data and knowledge transfer and skills for future sustainable food systems

RT 3.4: Better understanding of planetary boundaries facilitates innovative solutions for sustainable and circular management and use of natural resources as well as prevention and removal of pollution

RT 3.5: Improve the production with the help of digitalization in the agriculture and food sectors

RT 3.6: Development of technologies for bio-based packaging, use of expired products, reuse of water in the food industry, use of waste and sludge as bio fertilizers

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Expected outcome and impact

- **New advantage of social media** analysis as data source and platforms.
- Increasing of the **interest of industry in participation in research**
- Building a **national databases**, statistical analysis of the data;
- Better **understanding of antimicrobial resistance** and diffusion;
- **Institutional system and increased influence of scientific entities** (universities, institutes) in creating of Bioeconomy Departments
- **Increased multidisciplinary in education and training of specialists**
- Complex **analytical methods** to demonstrate benefits in terms of "entity vs. value chain"
- Modern methods in **supporting decisions on farming**
- Research, technologies, innovations on **improving soil fertility**, their fertility, reducing the cost of crops, beneficial actions to improve biodiversity,
- A **knowledge and information transfer system** that analyzes signals from the market and from the production of the agri-food sector on an ongoing basis, and then creates or adapts solutions to emerging problems and transfers them to economic practice.

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Challenges (C):

C4.1: Increase of **consumer awareness of food** quality, agroecology, organic farming and short value chains

C4.2: Lack of a **comprehensive system of education and training** of specialists in the field of sustainable food systems and the circular economy.

C4.3: Increase **public awareness of the need to reduce food waste** and use by products made from waste biomass.

C4.4: Traditional industries versus **healthy life and quality food** (new bio-technologies with direct application for a healthy lifestyle).

C4.5: Limited progress on collective **knowledge on new paths for development**: microbiome, food from the oceans, urban food systems, source of alternative proteins, meat substitutes.

C4.6: Low accessibility of **sustainable healthy products and empowerment of consumers** so they are able to make healthy and sustainable choices

C4.7: Promoting the **solutions in the lifestyle**, supporting the shift to more healthy, and more sustainable diet

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Main research topics:

RT 4.1: Reformulation of processed food, including the setting of maximum levels for certain nutrients

RT 4.2: Monitoring framework for responsible business and marketing conduct in the food supply chain

RT 4.3: Revision of EU marketing standards for agricultural, fishery and aquaculture products to ensure the uptake and supply of sustainable products

RT 4.4: Educational framework for sustainable food use and the shift to sustainable diets (eg. new nutrient profiles to restrict promotion of food high in salt, sugars and fat)

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Expected outcome and impact

- **Representative studies on** what **consumers perceptions** regarding local, organic foods and alternative food chains;
- New **social innovative initiatives** by flexible eligibility and control criterias;
- The **knowledge of digitization and technology**, new trends and channels made available to local food system actors by establishing a rural facilitator network or knowledge hubs
- New **analysis and mapping in the countries and regions**, which tools address which specific topics and provide which kind of information and how adjacent tools and platforms could be better connected
- The **application of cost-effective tools for reducing biomass loss and waste,** to provide relevant information and to adapt new, small scale waste management systems for consumers
- **Better substitution or replacement of meat with vegetable** protein sources, new sources of proteins
- Longer **shelf life** of food products can help reduce food waste.
- The decline in the **proportion of obese** population
- Increased share of **domestically produced goods in the consumption**

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Cross-thematic topics and hot topics in relation with the BIOEAST SRIA

- Lack of **new education schemes** for consumers (general, health and lifestyle – demand side), farmers and food chain actors (supply side).
- Need for **new management system for biomass collection** and processing from primary producers (non-agricultural use of the biomass). Innovative solutions how to use biomaterials and fully utilized agriculture residues in paper products, bioplastics, and other innovative solutions.
- Cooperation of **primary producers (incl. small and organic) to support their position in the food chain** and to improve transparency
- **Food waste and food fraud** in the food supply chain.
- **New (Big) Data and Statistics**: Environmental, biodiversity and natural capital observation (new statistics) AND digitization for monitoring of the FS transformation.
- **Sustainable water management** in the food value chain, with special regard to primary producers.

Thank you for your attention!

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 862699

Core Theme: Food Systems vs Sustainable Food Systems Partnership

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WHAT *R&I Areas* have been identified:

Sustainable Food Systems Partnership
RESEARCH AND INNOVATION AREAS

R&I 1 'Change the way we eat'

Subtitle: *Transition to healthy & sustainable diets everywhere: shifting food environments and consumer behavior to promote sustainable consumption of safe, healthy, nutritious, affordable, accessible, equitable and culturally acceptable tasteful foods while tackling malnutrition in all its forms and promoting health*.

R&I 2 'Change the way we process and supply food'

Subtitle: *Supply-side innovation towards carbon neutrality and circularity, reorienting the food environment to support healthy and sustainable diets*

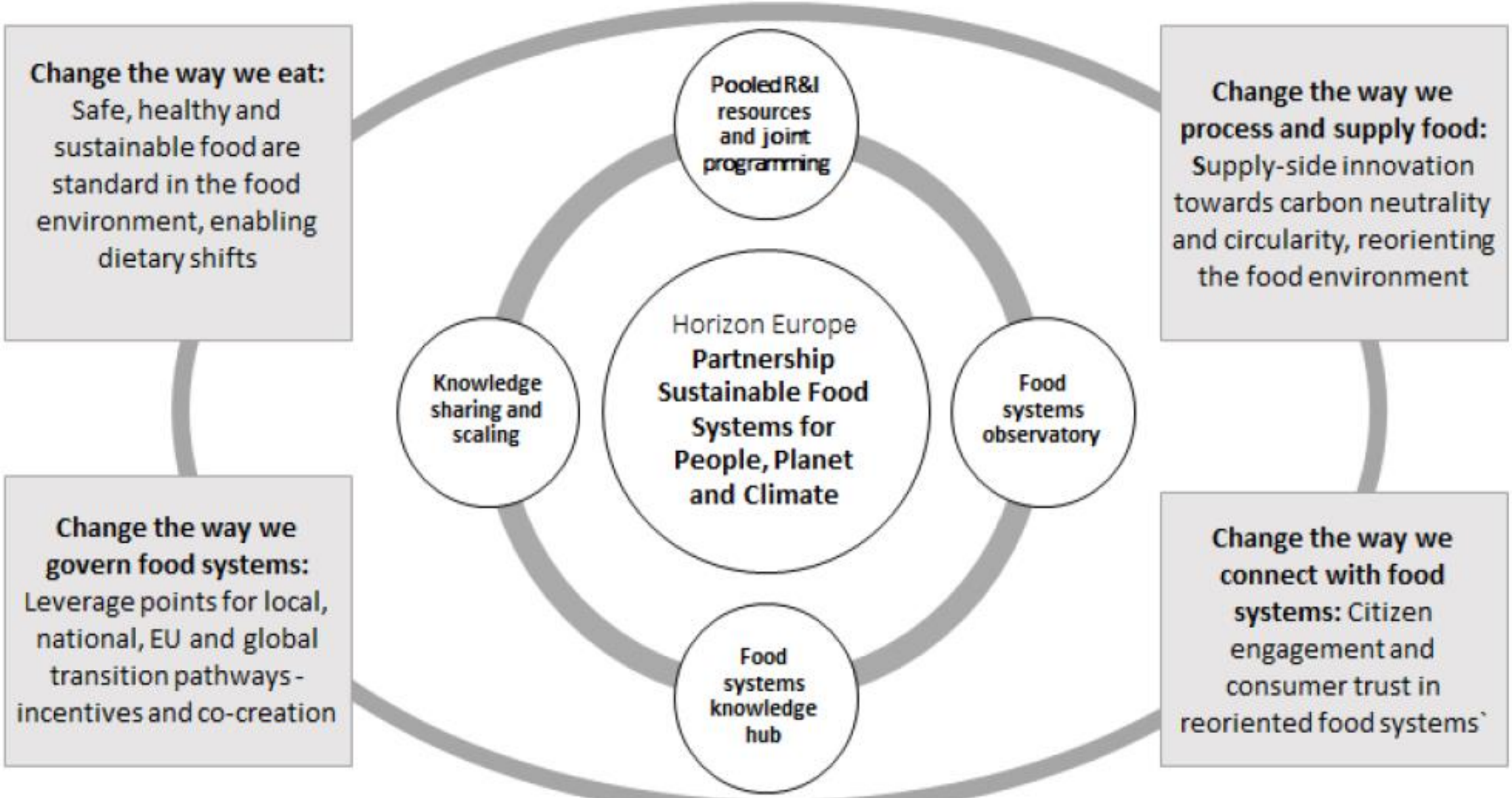
R&I 3 'Change the way we connect with food systems'

Subtitle: *Citizen engagement and consumer trust in reoriented food systems*

R&I 4 'Change the way we govern food systems'

Subtitle: *Leverage points for local, national, EU and global transition pathways, co-creation, including private ones like F2F code of conduct & local initiatives (e.g. cities)*

Enable R&I to drive food systems transformation processes



European Commission, Directorate-General for Research and Innovation, *Food 2030 pathways for action : partnership on safe and sustainable food systems for people, planet and climate*, Publications Office, 2021, https://data.europa.eu/doi/10.2777/13171