



Research and innovation in the food system transformation

BIOEAST TWG Food Systems

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Ministry of Agriculture and Rural Development, PL

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BIOEAST INITIATIVE

THE BIOEAST TWG FOOD SYSTEMS

- Central-Eastern European Initiative for Knowledge-based Agriculture, Aquaculture and Forestry in the Bioeconomy – **BIOEAST initiative**
- **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 institutions
- FS TWG focuses on **mapping the research and innovation activities** that address systemic approach to accelerate the impact transition pathways to sustainable and healthy food systems.
- In Food Systems TWG we are to **generate discussions** and **develop a bottom-up stakeholder driven approach** for defining synergies and complementarities between the agricultural sectors and food systems of our countries
- **We mobilised 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.





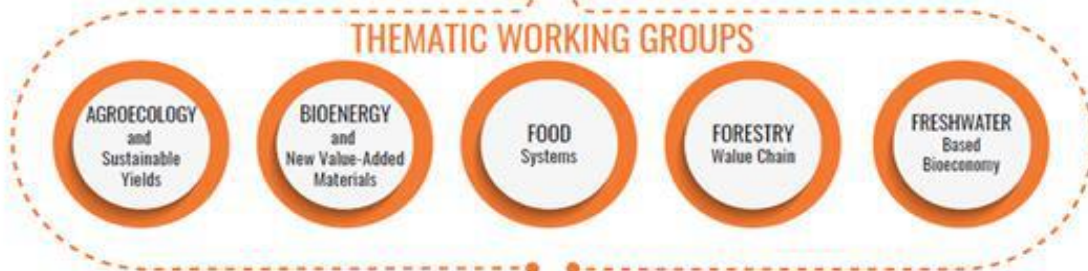
Governance

Political Level Endorsement

Advisory Council



THEMATIC WORKING GROUPS



NATIONAL LEVEL - BIOEAST HUBS



Strategic Research and Innovation Agenda



Thematic Working Groups

- Forestry (SK)
- Sustainable yields and agro-ecological intensification (HU)
- Bioenergy and new value-added products (HR)
- Food Systems (PL) , koordynacja MRiRW/IERGŻ-PIB/IRWIR PAN
- Freshwater (CZ)
- Bio-based chemicals (new!)
- Education (new!)



BIOEAST FOOD SYSTEMS TWG – AIMS

- provide **strategic advice and support** to the BIOEAST Strategic Research and Innovation Agenda but also to actively represent the CEE (Central Eastern European) countries in debates on EU Research and Innovation (R&I) policy framework FOOD 2030.
- focus on **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.



BIOEAST FOOD SYSTEMS TWG MEMBERS

11 COUNTRIES ON THE BOARD: PL, HU, SK, SV, CZ, LV, LT, EE, RO, BG, HR

Country	Institution
POLAND	
Paweł Chmieliński	Institute of Rural and Agricultural Development Polish Academy of Sciences - CHAIR
Justyna Cieślikowska	Ministry of Agriculture of Poland - COORDINATOR
Marek Wigier	Institute of Agricultural and Food Economics NRI – CO-CHAIR
HUNGARY	
Róbert Kocsis	Hungarian Dairy Experimental Institute
Zoltán Kovács	Szent István University Faculty of Food Science Science
Péter Penksza	Directorate of Food Industry, Hungarian Chamber of Agriculture
Andrea Gyórfy	Hungarian Chamber of Agriculture
Viktória Szűcs	Hungarian Chamber of Agriculture
CZECH REPUBLIC	
Svetlana Maljugina	Research Institute for Cattle Breeding
Jana Hajšlová	Institute of Chemical Technology
Slavomíra Vavreinová	Czech Academy of Agricultural Sciences
Petr Roubal	Dairy research institute
SLOVAKIA	
Martin Polovka	NPPC – Food Science Institute
Danka Moravčíková	Slovak University of Agriculture in Nitra
SLOVENIA	
Tadeja Kvas Majer	Ministry of Agriculture, Forestry and Food
Gasan Črnivec Ilja Osojnik	Biotechnical Faculty - University of Ljubljana



BIOEAST FOOD SYSTEMS TWG MEMBERS

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



FOOD SYSTEMS TWG ACTIVITIES

- 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), Writing (in progress).
- 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 2021-2022** 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 preparatory activities). Active **promotion of the TWG and collaboration with SCAR FS SWG** (meetings) and other events (BIW 2021)





**FOOD SYSTEMS STRATEGIC RESEARCH AND
INNOVATION NEEDS IN CENTRAL AND
EASTERN EUROPEAN COUNTRIES**

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FOOD SYSTEMS AND SUSTAINABILITY

- **actors and their interlinked value-adding activities**
- involved in the **production, aggregation, processing, distribution, consumption and disposal of food products** that originate from agriculture, forestry or fisheries, and parts of the broader **economic, societal and natural environments** in which they are embedded in such a way that the economic, social and environmental bases to generate food security and nutrition for future generations are not compromised.
- The food system is composed of sub-systems (e.g. **farming system**, waste management system, input supply system, **rural (local) systems** etc.) and interacts with other key systems (e.g. **R&I&Edu system**, energy system, trade system, health system, etc.).

(FAO, 2018)





CHALLENGES IN RESEARCH & INNOVATION FOR SUSTAINABLE FOOD SYSTEM IN CENTRAL AND EASTERN EUROPE

The main purpose of sustainable food system is nutritional food production with the respect to the environment and climate. To achieve this goal 3 main elements should be included:

- **Response to society needs** to ensure that quality and quantity of food make the solid basis of food security
- **Natural environment protection** and climate change mitigation as the crucial determinants of sustainable food systems
- **Understanding of complex adaptive food systems at different levels** and ensuring the **multi-level approach to food chains analysis** and solution development



STRATEGIC AREAS AND TOPICS

BIOEAST TWG FS SRIA

Strategic Area 1: Sustainable Food Production (PRODUCTION)

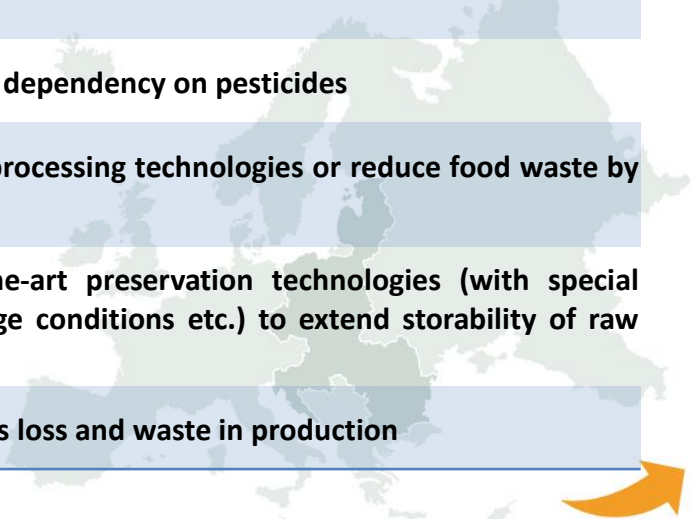
Research topic 1.1. Ensuring sustainable food production by human and financial investment – innovation, skills and technology shift

Research topic 1.2. Stimulating reduction of use and risk and dependency on pesticides

Research topic 1.3. Optimization of harvest for the applied processing technologies or reduce food waste by finding the best use of the raw materials and by-products

Research topic 1.4. Bring to the practice the state-of-the-art 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

Research topic 1.5. Promoting measures for reducing biomass loss and waste in production



STRATEGIC AREAS AND TOPICS

BIOEAST TWG FS SRIA

Strategic Area 2: Power and information in the food system: strengthen the food environments and vulnerable actors in the food chains (FOOD CHAINS)

Research topic 2.1. Promoting sustainable short food chains, initiatives and new green business models in food processing, wholesale, retail and food services

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

Research topic 2.3. Tackling with food fraud along the food supply chain

Research topic 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

STRATEGIC AREAS AND TOPICS

BIOEAST TWG FS SRIA

Strategic Area 3: Research, innovation, technology and investments for future sustainable food systems (RESEARCH)

Research topic 3.1 – Environmental, biodiversity and natural capital observation (new statistics)

Research topic 3.2 - Food system dynamics modelling & risk management at local level

Research topic 3.3. Future advisory services, data and knowledge transfer and skills

Research topic 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

Research topic 3.5. Improve the production with the help of digitalization in the agriculture and food sectors

STRATEGIC AREAS AND TOPICS

BIOEAST TWG FS SRIA

Strategic Area 4: Promoting sustainable food consumption and the shift to healthy, sustainable diets (CONSUMERS)

Research topic 4.1. Reformulation of processed food, including the setting of maximum levels for certain nutrients

Research topic 4.2. Monitoring framework for responsible business and marketing conduct in the food supply chain

Research topic 4.3. Revision of EU marketing standards for agricultural, fishery and aquaculture products to ensure the uptake and supply of sustainable products

Research topic 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)





BIOEAST FORESIGHT EXERCISE RELATED TO FOOD

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BIOEAST FORESIGHT EXERCISE RELATED TO FOOD

A Foresight Expert Group (FEG) of five independent experts was nominated to provide a better understanding of existing trends and to create scenarios of future bioeconomy developments. The BIOEAST Board invited the FEG to specifically focus on the following four areas:

- a) Sustainable natural resources, particularly soils and water
- b) Sharing economy in the context of sustainable food system
- c) Renewable carbon use and decarbonisation pathways
- d) Governance in the context of circular and sustainable pathways





BIOEAST FORESIGHT EXERCISE RELATED TO FOOD

- The circular bioeconomy has three dimensions that clearly identify the current and the future state of it - **economic, environmental and social**.
- In the Foresight Exercise **two more dimensions were also included**: technological and resiliency.
- The Foresight study is a forward-looking material based on analysis of data from BIOEAST countries, outlining **possible futures for 2050 along 4 possible pathways**.
- The scenarios focus on long-term **sustainability and competitiveness** rather than on present business results.
- The study focuses not only on human well-being, social equity and the conservation of biodiversity. It pays very **much attention to the replacement of non-renewable energy sources with biological resources**, on cascading **biomass use** and minimising **bio-waste**.



BIOEAST FORESIGHT EXERCISE RELATED TO FOOD

SCENARIOS

1. **The fully thriving circular bioeconomy** is one of the most desirable scenarios. This is where the sustainable use of natural resources and climate change adaptation take place. It also highlights the importance of developing new business models, circular RDI support, good management of natural resources and collaboration - public governance.
2. **The linear bioeconomy** focuses on competitiveness, neglecting the need for a systemic change. The strength lies in the well-known value chains and there is a lack of flexibility and low innovation.
3. **Business as usual:** The 3rd Scenario is based on the intensive use of natural resources and fossil sources. By exploiting nature, this system is dominated by currently economic models with global supply chains competing in the short term.
4. **New circular bioeconomy:** The aims of the 4th Scenario are to achieve the circular bioeconomy and maintain the environmental sustainability by strong responsibility towards management of natural resources, innovations, short value chains and education.

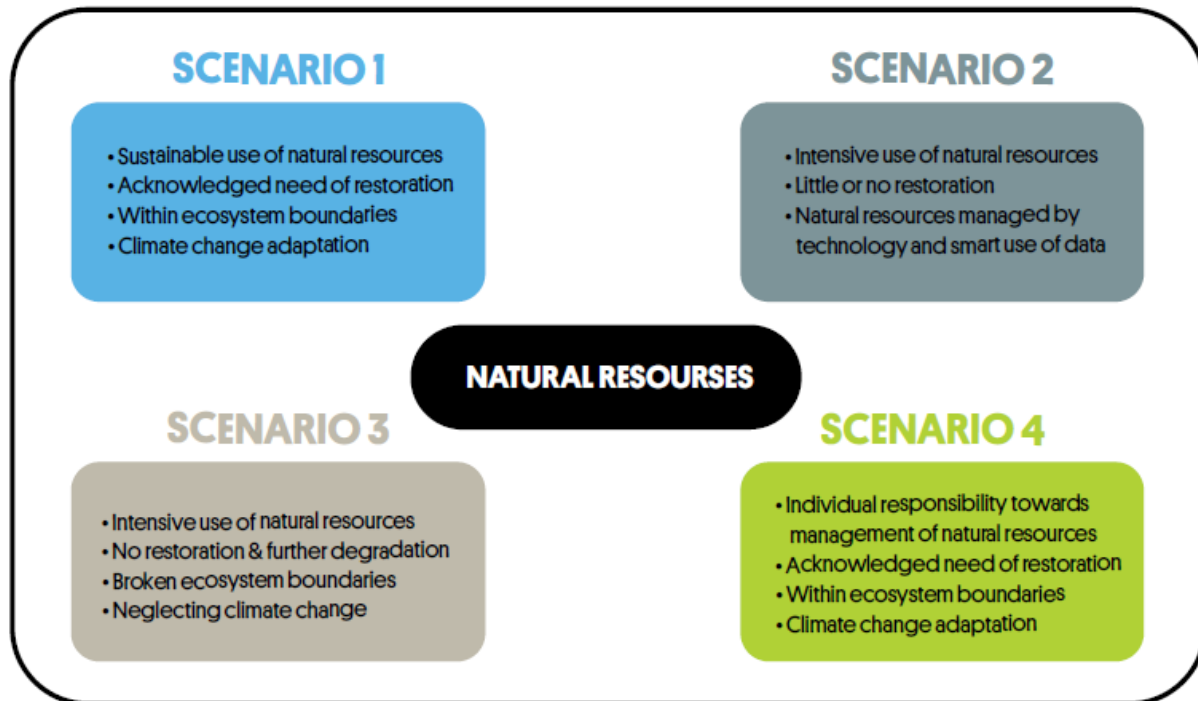


BIOEAST FORESIGHT EXERCISE RELATED TO FOOD

	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
<p><i>1: A fully thriving circular bioeconomy –</i> SUPERHEROES</p>	<p>SCENARIO 1</p> <p>Political willingness Innovation Aspects</p>	<p>Level of awareness Social Attitudes</p>	<p>Lateral growth Inclusiveness</p>	<p>Lack of motivation Heterogeneity</p>
<p><i>2: A linear bioeconomy –</i> PRETENDERS</p>	<p>SCENARIO 2</p> <p>Social economy Known values chains</p>	<p>Lack of flexibility Low innovation</p>	<p>Slight adaptation Possible sustainability</p>	<p>Market change Competition</p>
<p><i>3: Business as usual –</i> UNCHANGABLES</p>	<p>SCENARIO 3</p> <p>Short-term investment Revenue increase</p>	<p>Limited perspectives Low competitiveness</p>	<p>Long-term investment Innovation</p>	<p>Market differentiation Regulatory barriers</p>
<p><i>4: A new/nonprofit circular bioeconomy –</i> CHANGE AGENTS</p>	<p>SCENARIO 4</p> <p>Sustainability Flexible economy</p>	<p>Lack of alternative funding</p>	<p>Alternative business EU alignment</p>	<p>Stakeholders reaction Economic impasse</p>

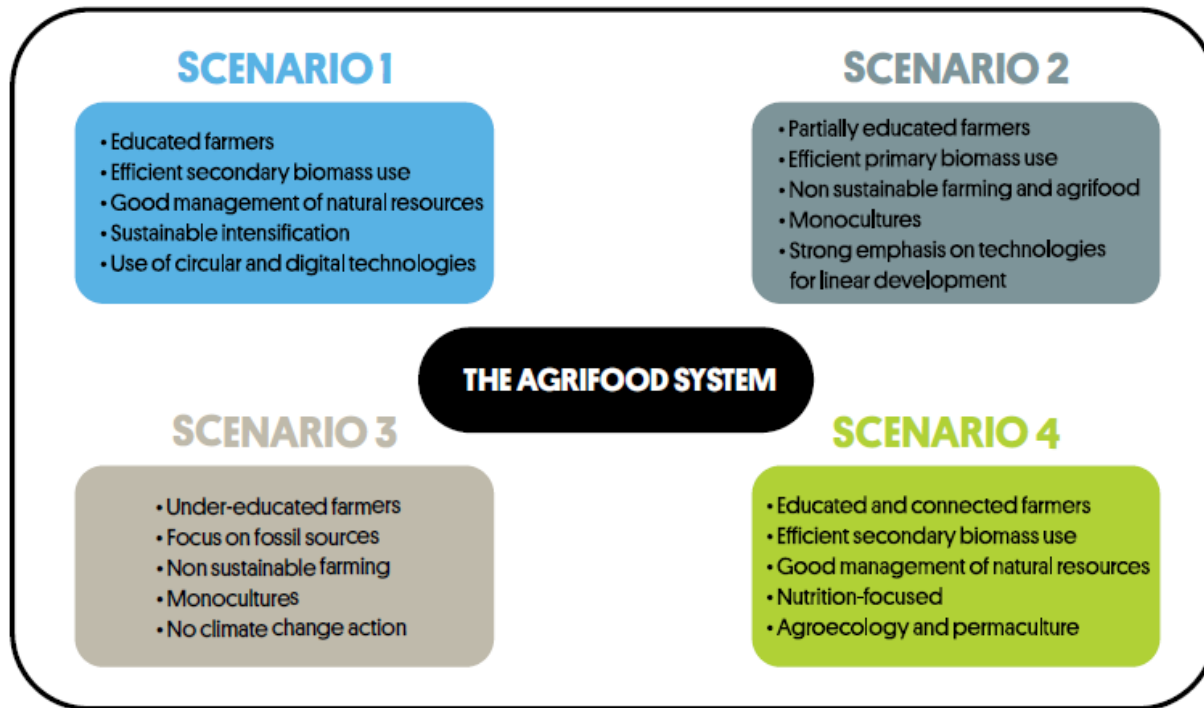
BIOEAST FORESIGHT EXERCISE RELATED TO FOOD

**Sustainable
natural
resources**



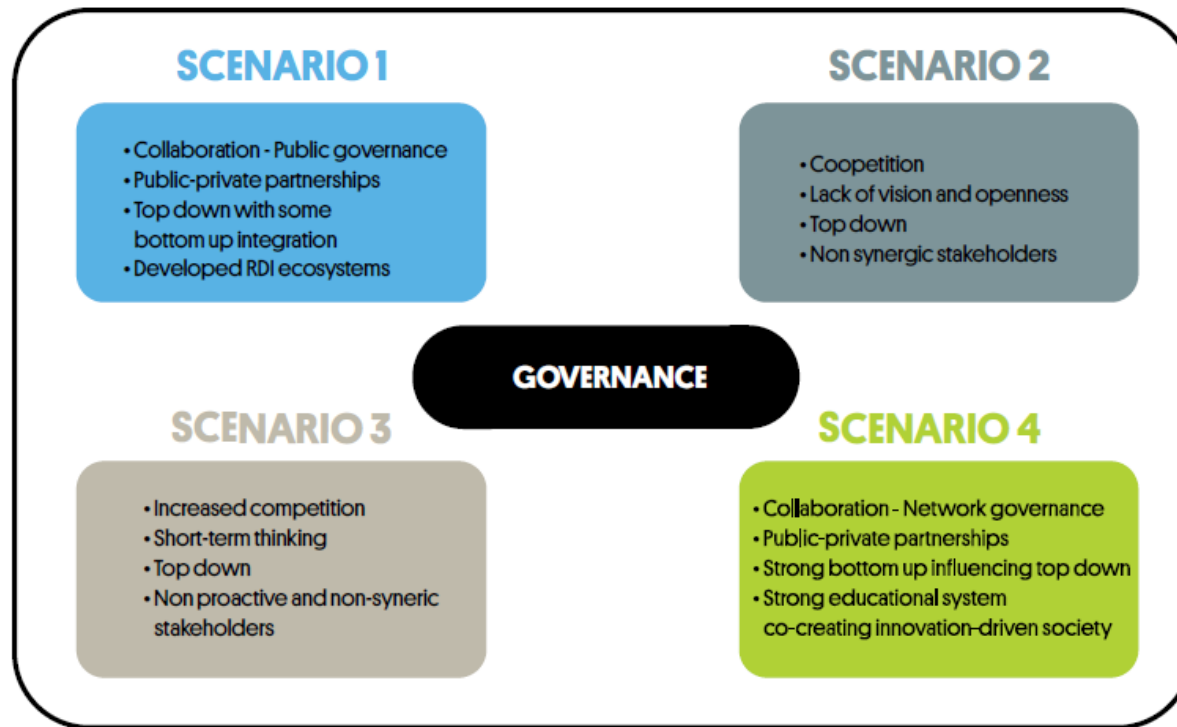
BIOEAST FORESIGHT EXERCISE RELATED TO FOOD

**Sustainable
food systems**



BIOEAST FORESIGHT EXERCISE RELATED TO FOOD

Governance in the context of circular and sustainable pathways



BIOEAST FORESIGHT EXERCISE RELATED TO FOOD

- A basic element of the **circular economy** is a **sustainable food system** which can increase resilience.
- However, it should be reached by **facing climate change, shortage of water and increasing food demands**.
- FAO estimates that **global food supply must increase by 70%** by 2050.
- The **amount of agricultural land is very high in the BIOEAST** region compared to the Western EU ones his advantage could be a competitiveness facilitator.
- **Greenhouse gas emissions rates** from the agricultural sector and agricultural productivity are **behind the EU average in the BIOEAST countries** (between 1990-2015 EU greenhouse gas emission declined by 20%, agricultural productivity increased by 25%; BIOEAST respective numbers 11% and 14%)

BIOEAST FORESIGHT EXERCISE RELATED TO FOOD

The desirable vision is clearly shown in the 4th Scenario. After a brief overview of the group, the main features related to its theme are presented.

strong responsibility
towards management of
natural resources,
innovations, short value
chains and education

to achieve the circular
bioeconomy and maintain
the environmental
sustainability

New circular bioeconomy

BIOEAST FORESIGHT EXERCISE RELATED TO FOOD

Discussion

What would be your reflection of the Foresight Scenarios in relations to future food systems?

Do you agree with the desirable vision presented by the Foresight Group in Scenario 4 – Change Agents.

What is a most important asset of the BIOEAST macro-region in terms of the food systems now and in the future (in the context of the Foresight Study presented)?

- *Scenario 1: A fully thriving circular bioeconomy – SUPERHEROES*
- *Scenario 2: A linear bioeconomy – PRETENDERS*
- *Scenario 3: Business as usual – UNCHANGEABLES*
- *Scenario 4: A new/nonprofit circular bioeconomy – CHANGE AGENTS*





BIOEAST TWG Food Systems

Research and innovation in the food system
transformation

Thank you for discussion

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