



A FACCE-JPI Event on 'Understanding system shocks in European food systems'

19 September 2024

WORKSHOP REPORT



I. INTRODUCTION & WORKSHOP METHODOLOGY

Europe is the fastest-warming continent in the world. Extreme weather events, once rare, are becoming increasingly frequent at an alarming rate. Europe will face longer periods of drought and extreme heat. Recent system shocks such as the COVID-19 pandemic and the two wars at the edge of Europe have underlined the risks of economic efficiency at the expense of food system resilience and security. Global supply chains are disrupted, having immediate and unprecedented effects on the European economy and security.

Two often competing narratives, on economic competitiveness vs. sustainability in the context of self-sufficiency, are driving policy discussions with little scientific input. Much knowledge is furthermore contained in global reports with no details on the European food system. The first European Climate Risk Assessment, published by the European Environmental Agency in March 2024, shows that the European food system is not prepared for climate shocks and that Europe is dependent on a small number of suppliers for key inputs. In the context of natural resources such as soil and freshwater and the ecosystem services they support, the current European food system is predominantly dependent on the rest of the world.

Urgent action is needed to develop a less dependent and more self-sufficient European food system. Furthermore, little is known about how the impacts of these shocks in the food system will be distributed on a societal level, and how to consider food justice aspects in climate shock risk assessments and policy-making. FACCE-JPI considers it a priority that:

- Europe is adapted to climate shocks
- Europe increases its resilience through food system redesign
- Europe ensures this process is just.

The objective of the workshop was to identify key enablers for rethinking the future European Food System through the lens of climate change, addressing the impacts of climate shocks. The workshop focused on the need for a food systems approach, with particular attention paid to the concepts of adaptation and resilience. The central question guiding the workshop was: How can we build a resilient European food system?

The workshop was organised in several steps. After following an introductory and icebreaker session, three keynote presentations were delivered (Annex 2). The first two presentations addressed the current challenges and stakes, while the third presentation illustrated possible actions and priorities related to water cycle management. Subsequently, interactive sessions were professionally facilitated to ensure a productive discussion and thorough digestion of the presentations' content. The afternoon sessions were focused on possible policy responses and associated knowledge needs.

The outcomes of the workshop aim to convey to government representatives and key institutions that we are at a turning point that requires an agreed framework for disaster risk management and for building resilience in our food and agricultural systems.

This workshop is part of a larger policy framework that will culminate in an event hosted by Hungary in December 2024, during its presidency of the Council of the European Union. The

event will focus on food system security. The conclusions of the FACCE-JPI workshop will be presented to the Hungarian presidency for this event. The outputs also aim to provide key insights into research and innovation pathways for the HEU Partnerships, the 10th Framework Programme and the 6th SCAR Foresight exercise.

II. WORKSHOP OUTCOMES

MORNING SESSIONS

KEYNOTE PRESENTATION 1: FOOD ALERT: STRESS TESTING THE EU FOOD SYSTEM

BY CHRIS HEGADORN – SCIENCES PO UNIVERSITY, PARIS

The presentation from Chris Hegadorn, lead organiser of the Food Alert Project, focuses on the growing threats to food systems due to factors like climate change, conflict, pandemics, and accidents. The Food Alert Project is designed to bridge the gap between data and the necessary crisis response preparations. This is achieved through the use of a stress testing methodology that simulates a crisis scenario, allowing a taskforce of experts from policy, industry, research, civil society and journalism to generate comprehensive policy recommendations to the European Commission on how to build food resilience.

- In the short-term, **measures to alleviate food shortages** included
 - o upscaling food reserves through a Food Allocation Reserve Management (FARM) program;
 - o relaxing environmental standards for critical food imports during shortages;
 - o ensuring support for vulnerable populations;
 - o strengthening the European Food Security Crisis preparedness (EFSCM).
- In the long term, the taskforce identified the **following measures for a resilient and sustainable food sector**:
 - o Identifying available land and water for food production, with a focus on protein crops;
 - o increasing investment in food innovation, particularly in alternative proteins;
 - o prioritising crops for food and feed rather than biofuels;
 - o reducing livestock subsidies under the CAP;
 - o assisting farmers in transitioning to crop production.
- **Supply chain resilience** was also addressed with the following measures:
 - o support regional food supply chains;
 - o share risks with European farmers via EU insurance mechanisms;
 - o establish an EU joint purchasing mechanism;
 - o prevent excessive food speculation.

The presentation highlighted the need for stress-testing food systems similar to banking and electric grids, and how the Food Alert initiative could be adapted across different regions. Key questions were raised on how to integrate the results and fast-track methodology into ongoing European initiatives and better prepare for food crises. The approach encourages collaboration with stakeholders to identify vulnerabilities, enhance food system resilience, and improve crisis response through simulations. Journalists were invited to report on the

simulation outcome to gain insight into how the news cycle affects the policy-science interface.

KEYNOTE PRESENTATION 2: CLIMATE RISKS TO THE EUROPEAN AGRI-FOOD SYSTEM

BY BETTINA BARUTH – JRC DIRECTORATE FOR SUSTAINABLE RESOURCES

The presentation discussed the climate risks to the European agri-food system, addressing the following key challenges, policy needs, and research priorities:

- **European Agri-Food System Challenges**

The system has a large environmental and socio-economic footprint, relying heavily on imported fossil fuels and imported feed for livestock. Europe faces a triple crisis: climate change, biodiversity loss, and pollution.

- **Key Climate Risks**

Europe is warming faster than the global average, with 2023 being the warmest year in recorded history. Risks include heatwaves, changing rain patterns, and extreme events like droughts and floods, all of which threaten food security, water resources, ecosystems, and infrastructure. Specific hazards affecting agriculture include reduced water availability, heat stress, extreme weather events (like late frosts), and pests/diseases.

- **Impact on Food Security**

Climate change poses severe risks to crop production, particularly in Southern Europe where prolonged drought and excessive heat are major concerns. Water-intensive food production and reliance on imported feed/fodder are especially vulnerable.

- **European Climate Risk Assessment (EUCRA)**

A comprehensive report led by the European Environment Agency (EEA), commissioned to assess climate risks and inform the EU on climate adaptation priorities identifies critical risks across agriculture, food supply chains, and water resources.

- **Suggestions for policy action can be summarised as follows:**

- Urgent adaptation of food production systems, including sustainable farming practices and dietary shifts toward fewer animal products;
- Coherence and consistency across EU policies affecting food security, including improving the resilience of primary production and integrating climate risks into the Common Agricultural Policy (CAP).

- **Suggestions for urgently needed research include:**

- Systemic understanding of climate change's impact on food systems and the interaction between sustainability, resilience, and competitiveness;
- The combined effects of climate are a recent research issue, e.g. the premature arrival of spring and the subsequent occurrence of late frosts have a considerable impact on crop yields;
- Improved indicators for measuring resilience and enhanced cooperation across sectors;
- Importance of translating research into practical solutions for stakeholders in the food chain;
- Current models need to be adapted to a constant threat of extreme events e.g. models could not deal with wetness and did not predict very low yields.

In conclusion, addressing climate risks to the agri-food system will require a multi-dimensional approach, integrating policy action, research, and transformation of food systems to ensure long-term resilience and sustainability.

KEYNOTE PRESENTATION 3: ANALYSING PRIORITIES FOR EUROPEAN AGRIFOOD SYSTEM RESILIENCE AND SECURITY

BY MARTIN KOVÁČ – NATIONAL TRUST, SLOVAKIA

The presentation focused on addressing climate change and its impact on water management, land use, and soil quality in Europe. It emphasised the need to monitor systematically water cycles because a stable water cycle is essential for climate stability.

The key points were:

- **Climate Change and Land Use**

Continual land use changes, including deforestation, soil sealing, and desertification, negatively affect the water and carbon cycles. Declining soil and vegetation cover reduces biotic regulation, leading to higher temperatures and increased flood and drought risks.

- **Water Cycle Imbalance**

Europe is experiencing disruptions in small water cycles, reducing evapotranspiration, leaving more heat in the lower atmosphere. Retaining rainwater in soil is crucial for balancing water and energy cycles, stabilising the climate, and supporting ecosystems.

- **Water Paradigm Shift (NEXUS Approach)**

A sustainable approach is required, integrating water, carbon, energy, and nutrient cycles. The water cycle is interconnected with the Sustainable Development Goals (SDGs), especially SDGs related to water, energy, food, ecosystems, and climate.

- **Soil and Ecosystem Services**

Soil plays a key role in carbon and water retention, food production, and climate regulation. Maintaining healthy soil is crucial for water cycle restoration and ecosystem stability.

- **Case Studies and Solutions**

Various case studies, such as the Torysa community and many others in Slovakia¹, demonstrate the success of water retention and anti-erosion measures in improving soil and landscape health. Measures like rainwater harvesting, regenerative agriculture, and reforestation are essential to enhance water retention and reduce climate risks.

- **Future Planning**

The EU aims to increase the water retention capacity of soil and landscapes by 2035, advocating for decentralised public water infrastructure and cross-sectoral planning. A new economic model is proposed, recognising soil and water as public goods and investment opportunities through "Carbon and Water Banks." Nature-based solutions can connect local landowners, land users and investors. Monitoring and certification systems provide support.

- **Global Call to Action**

The presentation advocates for a global action plan (GAP) to restore natural water cycles and stabilise the climate, emphasising the need for cooperation, policy harmonisation, and local participation. GAP² provide KPI and measurable targets for the adaptation action.

¹ <https://climate-adapt.eea.europa.eu/en/metadata/case-studies/landscape-and-watershed-recovery-programme-for-the-kosice-region-of-slovakia>

² https://bio4climate.org/downloads/Kravcik_Global_Action_Plan.pdf

The overarching message underscores the necessity for integrated water, soil, and climate planning to mitigate the impacts of climate change. This entails adapting landscape structures through a range of nature-based solutions (NBS), with a particular emphasis on long-term sustainability and systemic global solutions.

IDEAS FROM GROUP DISCUSSIONS

A wide array of ideas triggered by the presentations were exchanged in small group discussions. The ideas in question have been collated and categorised under five main emerging topics labelled as important to be discussed further.

- **Food self-sufficiency** - *What do we mean? Is it desirable? Is it feasible?*
 - o False dichotomy between food security and environment remains a challenge in food systems modelling; models that have built scenarios for 2030 have not accounted for ecosystem services, including soil services, and their benefits.

- **Inequalities and vulnerable groups**
 - o Extreme diversity in Europe with regard to the way in which how system shocks are experienced;
 - o Some stakeholders are not involved in discussions which results in missing considerations;
 - o Main issue is the concentration in supply chains in a handful of companies that are able to dictate the rules;
 - o Need a stronger global governance: “WTO does not have teeth”;
 - o Social justice: should not solely be on farmers shoulders;
 - o Need to take in consideration vulnerable groups also at country level.

- **The interactions between EU and country level** - knowledge transfer, subsidies, best practices for transformation, etc.
 - o There should be increased efforts to scale up to country level;
 - o Does the CAP truly addresses system shocks? Need science advice on best practices to help target subsidies towards the right practices;
 - o Agroecology: main constraints are linked to the socio-economic contexts. We should emphasise and document the beneficial effects as well (ecosystem services) to trigger transition. It is the best way to convince stakeholders;
 - o We have the knowledge, we know what to do, but how to do it and address urgency is the question.

- **The involvement of stakeholders in decisions** - how to engage them, who, the opposing views/needs. Particularly, the role of consumers, including how to change marketing, promote local consumption, support informed decisions and education
 - o Set up living labs in cities to reach vulnerable groups (it was mentioned the possibility to focus on large cities such as Paris which can act as a leverage point);

- The issue of food security is inextricably linked to that of inequality, and thus cannot be considered a problem confined solely to the domain of the agricultural sector;
 - Need to act locally as consumers, and make informed decisions in consumption;
 - More simulation like the Food alert project to help develop recommendations. Two days of social simulations are very efficient;
 - Need an education that will empower a larger proportion of citizens to understand and be motivated to get involved.
- **The water cycle and associated water management** have the potential to act as a catalyst for change and a means of mitigating the impact of shocks. Furthermore, they can be employed to adapt the landscape structure in order to enhance climate resilience.

AFTERNOON SESSIONS

FISHBOWL DISCUSSION- WHAT DO YOU THINK IS NEEDED IN TERMS OF POLICY ACTIONS AND RESEARCH? WHO? WHERE? HOW?

A wide range of issues was covered in the fishbowl³ session (Table 1). While the fishbowl discussion did not cover several topics, it was agreed that they should be kept in mind, including the reduction of food waste, the role of public health, and the links between health and nutrition.

Table 1 List of issues emerging in the fishbowl session

<ul style="list-style-type: none"> - Broken global governance. - Power dynamics in the food system. The better understanding of power dynamics and leverage points for change would require reviewing what has been published by social scientists. - UN Strategic dialogues (UN Food systems coordination Hub) are supposed to identify national pathways to food security but still are not binding. - EU level policy coherence: there is a need for alignment and buy-in from countries and stakeholders. Need to address some specific policy goals for example as identified in the strategic dialogue⁴. - Some EU countries are absent from discussions. How do we take country priorities in consideration at EU level? Some participants suggested to look at macro-regions where conditions are similar. - For Eastern European countries: we need more evidence-based recommendations, increased capacity.
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³ Fishbowl meetings have an inner circle of chairs and an outer one. Those on the inside (the fishbowl) discuss a topic, and those outside observe. Individuals can enter and leave the fishbowl to join or exit the conversation as appropriate.

⁴ https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/agriculture-and-green-deal/strategic-dialogue-future-eu-agriculture_en

- Many Science Policy Interfaces (SPI) are dealing with the issue of food systems/food security in parallel.
- Education needs to be improved so next generations are more aware: creative approaches need to be explored to change behaviours while not putting full responsibility on consumers.
- We need to better understand/document what we mean by food system transformation.
- What food security are we aiming for: more diversity? More affordability? Linear food systems for a cheap way?
- We need to quantify better the benefits that ecosystem services bring from EU agricultural systems and to promote this accountability in the supply chains.
- Self-sufficiency was at the heart of a lot of discussion around what it means (e.g. self-sufficiency at country level, at European level?). Some participants highlighted that self-sufficiency is not possible or even desirable as EU is a global player and interdependency with other regions is high. Some participants emphasised that within the EU there is a need to be more resilient rather than self-sufficient and this would require more redundancy and adaptability. The EU is a big winner in the global market and liberal world trade. For some participants self-sufficiency is misleading view, instead we need to have more resilience in society on many aspects, not just food, as it is all interconnected.

Subsequently, participants were invited to identify one or two topics for further elaboration in group discussions. This was achieved by placing the two ideas/post-its on a large board. A silent grouping exercise facilitated the identification of six main discussion themes:

1. Global governance
2. Politics and policy coherence
3. Food System knowledge transfer and exchanges
4. Definitions and Accounting in Sustainable Food Systems
5. Water Cycle as a game changer
6. Food democracy

GROUP WORK OUTCOMES

1. Global governance

- WTO Trade Agreements and Science-Policy Interfaces

Participants discussed how world trade discussions could be connected to science-policy frameworks like food security (The Committee on World Food Security-CFS) and climate agreements (UNFCCC).

- Facilitating Trade During Disruptions

Considered whether an existing organisation or a new institution could manage global trade and resource distribution during crises, collaborating with major stakeholders.

- Food System Redundancy and Storage Policies

Talked about the importance of food storage policies and direct purchasing to manage food security and supply chain risks.

- Information Technology for Global Monitoring

Explored the use of technology like blockchain and systems like AMIS (G20 initiative) for tracking food prices and adding data about global shocks. It should be expanded to include more crops. Envisioned a global monitoring system to predict and manage disruptions.

- **Global Commission on Food System Shocks**

Considered the creation of a global commission to oversee and respond to food system shocks using advanced monitoring systems.

- **Knowledge Sharing and Governance**

Discussed political science research to understand governance gridlocks and unlock discussions. Emphasised knowledge sharing on best practices to help countries meet their SDGs.

- **New Professions and University Roles**

Envisioned future professions focused on integrating science and policy and encouraging systemic approaches across sectors.

- **Mapping Committee Mandates**

Suggested expanding the mandate of committees responsible for food security reports to track and map global food system shocks on an annual basis.

2. Politics and policy coherence

- **Long-term Vision for Food Systems**

The group agreed on the need for a long-term, ambitious vision for future food systems to guide policies effectively.

- **Scientists and Policy Engagement**

Scientists often lack understanding of the EU policy cycle. A fellowship program, similar to one in the US, where scientists work in the policy domain for two years, was suggested as a way to bridge this gap.

- **Policy Coherence**

During the trilogue procedure (when policies are amended), incoherence and inconsistency can arise due to the sheer number of amendments. A "proofreading" mechanism to check for internal and external coherence was proposed.

- **Policy vs. Implementation**

Even when policies are coherent, implementation can be problematic. Additionally, policies may be formulated without considering existing policies, leading to conflicts.

- **Multi-Annual Financial Framework**

Brief mention was made of aligning the financial framework with sectoral policies (e.g., CAP), though this topic wasn't deeply explored.

- **Politics and Policy**

The group discussed how politics, driven by short-term urgencies, often undermines long-term policy needs. Changes are needed in the democratic political system to protect long-

term goals; suggested solutions included term limits, random selection of political candidates, or the use of citizen assemblies.

- **True Cost of Food**

There's a need to understand the true cost of food, but current tools like lifecycle assessments and environmental footprints may not be sufficient. Non-monetary approaches were mentioned as alternatives to better capture the value of food, including waste reduction and value of ecosystem services of soil.

- **Measuring Progress Beyond GDP**

It was suggested that GDP might not be the best measure of success, as some activities (like food waste) could misleadingly contribute positively to GDP. Measurable metrics for reporting the proportion of investment and expenditure allocated to improving the provision of ecosystem services should be included in GDP.

- **Pilot Studies**

To test new policies, pilot studies or beta testing were recommended before rolling out changes at the European level.

- **Indigenous Knowledge**

Lastly, the importance of including indigenous knowledge and efforts to decolonise knowledge were emphasised.

3. Food System knowledge transfer and exchanges

- **Investment in Farm Advice and Educational Systems**

The group emphasised the importance of investing in farm advisory services and food systems education. There should be incentives and evaluation metrics for researchers and academics, recognising outreach efforts (such as working with farmers) rather than just publishing academic papers. Academics should be able to build their careers through practical engagements like talking to farmers and providing direct advice, rather than relying solely on publishing high-profile papers.

- **Farmer Knowledge and Extension Services**

There should be metrics to measure the impact of farmer knowledge exchanges and extension services. This would make the knowledge transfer from research to on-the-ground practices more tangible. More knowledge and farm advice on agroecology is also needed to support transition.

- **Food Systems Thinking and Localised Solutions**

The group discussed food systems thinking at local and regional levels, emphasising coalitions for knowledge exchange. Solutions that work in one system or region may not work elsewhere, so there is a need for flexibility and localised learning.

- **Complexity and Co-Benefits in Food Systems**

Acknowledging the complexity of food systems, the group spoke about co-benefits and trade-offs in food choices, such as how different food options affect health and environmental outcomes.

- **Food System Inertia and Lock-In Situations**

Many food systems are stuck in inertia, meaning they struggle to change due to constraints like farmers being close to bankruptcy. This limits their ability to experiment with new methods. Understanding these roadblocks is crucial for transforming food systems effectively.

The overall discussion highlighted the need for practical, flexible approaches to knowledge transfer, local learning, and addressing structural barriers in food systems.

4. Definitions and Accounting Sustainable Food Systems

- **Defining Sustainable Food Systems**

The group noted that current food systems are more linear and economically efficient, but the goal is to move toward sustainable systems. A clear definition of what constitutes a sustainable food system is essential, as it will provide a target to work toward. However, the definition must bridge various research fields, ensuring all disciplines share a common understanding.

- **Contextual Applicability**

The definition should be adaptable to different local realities (geographical, cultural, etc.). Metrics used to measure progress toward sustainability may differ across regions, reflecting their unique challenges and characteristics.

- **Measuring Sustainability**

The group discussed how to develop metrics linked to the definition of sustainable food systems to measure progress. These metrics would reflect various dimensions of sustainability, such as environmental, social, health and economic factors. They should also be flexible to regional differences.

- **Simplifying Complexity for Policymakers**

Given the complexity of food systems, it is crucial to simplify the data and findings so that they can be effectively communicated to policymakers, facilitating actionable political outcomes.

- **Balancing Sustainability Dimensions**

A key point was how to balance or integrate different dimensions of sustainability, such as environmental, social, and economic factors. There was discussion on whether these should be considered individually or together and which dimensions or impacts (e.g., climate, water) are more relevant.

- **Resilience**

The group agreed on the importance of incorporating resilience into the definition of sustainability. Sustainable systems may not always be resilient, so tools for measuring resilience are needed.

- **Goal-Oriented Transition**

There is a need to focus not just on sustainable practices but on defining and measuring progress toward an ultimate goal of sustainability. Currently, there is too much emphasis on practices without clear objectives for the transition.

5. Water Cycle as a game changer

- Compensating Farmers for Carbon Storage

Attention has been on carbon credits for farmers storing carbon in soils or biomass. However, there is now a shift toward policies promoting resilience and adaptation in the land sector which goes broader than just carbon.

- Vulnerability of the Land Sector

The EUCRA report identifies the key vulnerability in the interaction between agriculture and water, highlighting the need for policies that enhance resilience.

- Water Balance and Resilience

The participants discussed how future improvements in Earth observation could enable farm-scale water balance calculations, allowing farmers to measure improvements in water-holding capacity at the farm and landscape level.

- Incentives for Water Services

Improved water services at the local level, such as increasing water retention and land rehydration, could result in reduced local taxes as an incentive. Valuation and financing of soil and landscape ecosystem services as a new systemic approach to support and motivate local stakeholders (land owners, land users, citizens, local communities) to adapt landscape structures and regenerative management of water resources and soil funds.

- Multi-Scale Adaptation Tools

It would be interesting to explore the use of tools at the farm, municipality, and landscape levels to improve resilience and water services, guiding land sector adaptation.

- Integrative Land Policies

Policies should be more integrative, encompassing both land and water services, rather than focusing solely on agriculture. Coherence across policies remains a key focus.

6. Food democracy

- Local Citizen Empowerment

The group highlighted the importance of citizen-based assemblies and food councils at the local level. Empowering these groups with funding and decision-making power could lead to meaningful community-level changes, and their successes could be replicated across other communities.

- Research and Multi-Actor Approaches

There was a call for research into the effectiveness of multi-actor approaches and citizen assemblies. This could help with replicating successful food councils and improving collaboration.

- **Land Use Policies**

Policies on municipal land leased to farmers were discussed. Involving food councils and water boards in the formulation of these policies could have a positive impact on local agriculture, food systems and production planning. It is essential to assess the impact of land use on the water cycle and climate. Local water planning is the first stage and fundamental level of integrated water, soil and climate planning.

- **Balancing Local and Global Food Production**

The discussion addressed the need to balance self-sufficiency in food production with Europe's global responsibility. This includes understanding where imported food comes from and its impact on those areas.

- **Decentralising the Food Supply Chain**

One way to encourage larger players in the food supply chain to adopt sustainable policies would be to support smaller businesses, decentralise the food market and activate the new economy related to land ecosystem services. There is a strong basis for a circular bioeconomy approach at the local level.

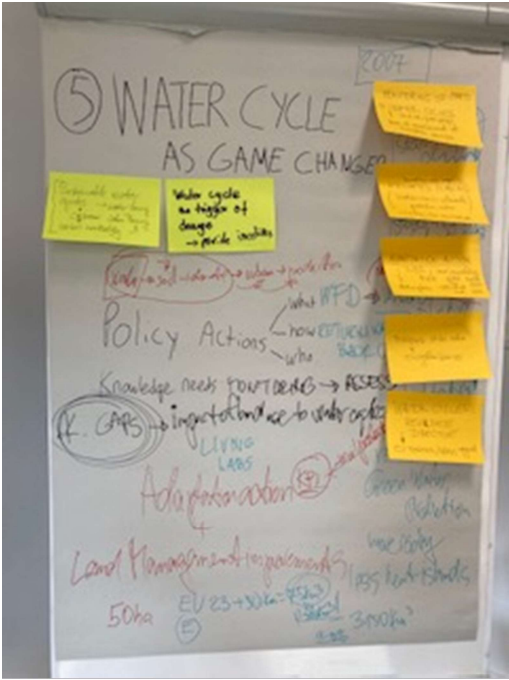
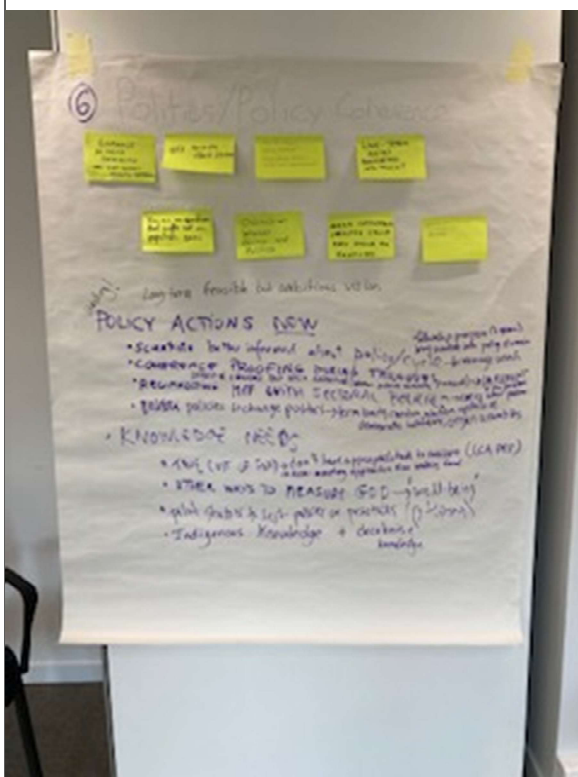
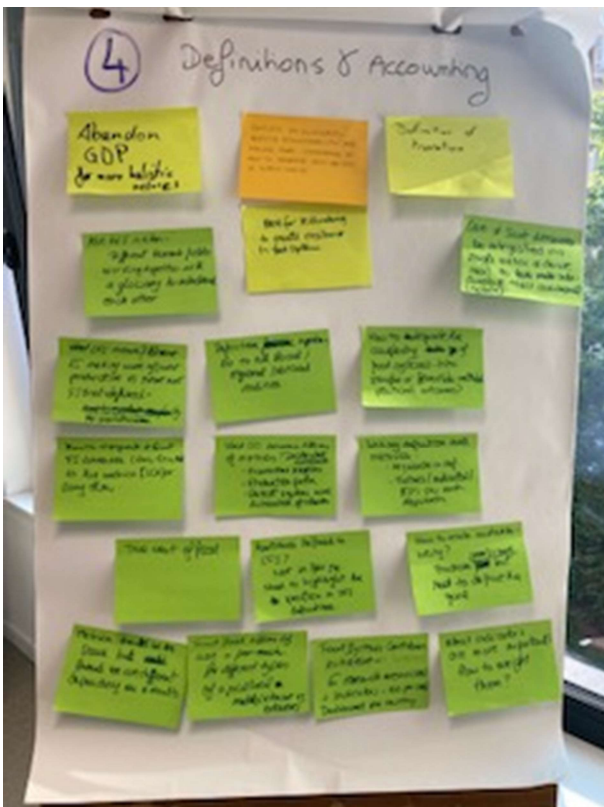
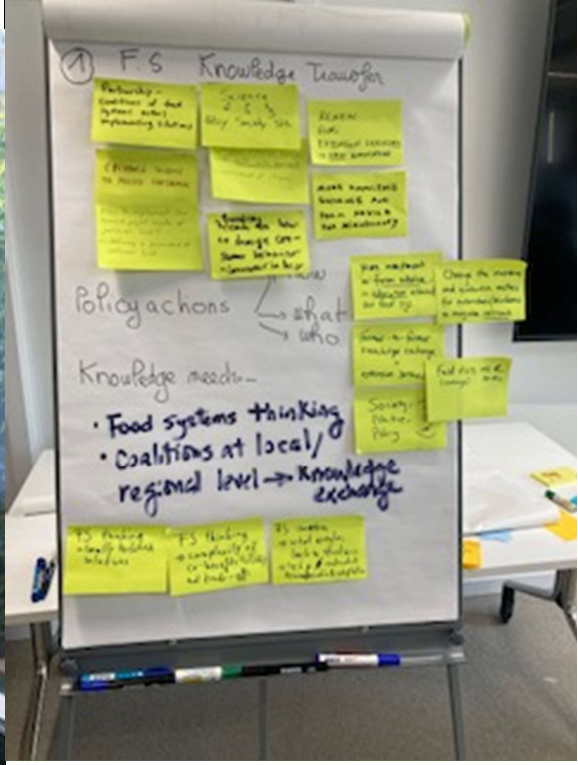
- **Citizen Engagement**

A key challenge is engaging overburdened citizens in food democracy efforts. Research is needed to understand how to encourage citizen participation without overwhelming them.

- **Food Democracy and Food Systems**

A final question raised was whether food democracy should guide the direction of food security and systems, or whether it should reflect people's values, ideals, and preferences about what they eat.

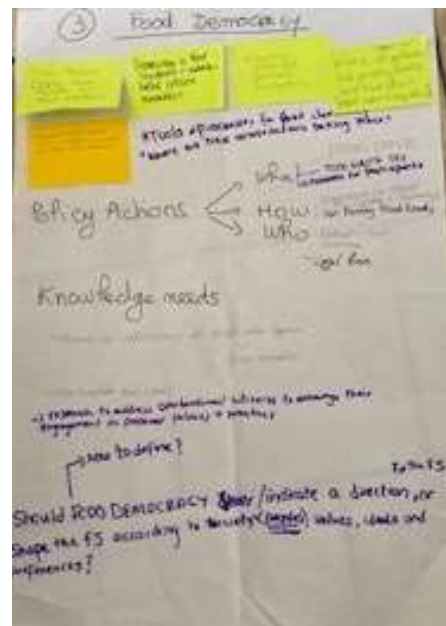
Table 2: Posters of the group work

<p>Water cycle as a game changer</p>  <p>⑤ WATER CYCLE AS GAME CHANGER</p> <p>Water cycle as trigger of change → people include</p> <p>Policy Actions → what? HOW? WHO?</p> <p>Knowledge needs → FORT DEARS → ASSESS → LIVING LABS</p> <p>Adaptation action → 135 best studies</p> <p>Land Management requirements → 50ha EU 23+30ha → 300ha</p>	<p>Politics & Policy coherence</p>  <p>⑥ Politics/Policy Coherence</p> <p>Long-term benefits but solutions VOTED</p> <p>POLICY ACTIONS NOW</p> <ul style="list-style-type: none"> • Science better informed about Policy/Climate Learning needs • Coherence PROGRESS DURING THE 2010s 'transformation period' • RECONSTRUCT NOT WITH REGIONAL POLICY IN REPLY TO • POLICY coherence change policies from being random to being systematic <p>KNOWLEDGE NEEDS</p> <ul style="list-style-type: none"> • NEW (or old) way? but approaches to measure (GAP) • OTHER ways to MEASURE GDP → growth • split GDP & less people or poverty (GDP) • Indigenous Knowledge & decisions
<p>Definitions and Accounting</p>  <p>④ Definitions & Accounting</p> <p>Abandon GDP for more holistic metrics</p> <p>Policy actions → what? HOW? WHO?</p> <p>Knowledge needs → Food systems thinking, Coalitions at local/regional level → knowledge exchange</p>	<p>Food Systems Knowledge Transfer</p>  <p>① FS Knowledge Transfer</p> <p>Policy actions → what? HOW? WHO?</p> <p>Knowledge needs → Food systems thinking, Coalitions at local/regional level → knowledge exchange</p>

Global Governance



Food Democracy



III. CONCLUSIONS

The FACCE-JPI event on 'Understanding systemic shocks in European food systems' provided a critical overview of the vulnerabilities of the European agri-food system and their relationship with food security, offering valuable insights for stakeholders in the sector. Through keynote presentations, discussions, and group work, participants highlighted the need for **urgent and targeted action** to build resilient, sustainable, and just food systems.

Key conclusions from the event include:

1. **Food System Climate Shocks and Food Resilience:** Europe's agri-food system is highly vulnerable to climate-related risks such as droughts, extreme temperatures, and supply chain disruptions. A significant outcome of the workshop was the need for a systematic **stress-testing** methodology, similar to those used in financial systems, to identify weaknesses in food supply chains. This could help anticipate crises and formulate crisis-response plans at both the EU and global levels.
2. **Water Management, Soil and Land Use:** Water retention and management were identified as key levers to mitigate food systems shocks and improve their resilience. The **NEXUS approach**, which integrates water, carbon, energy and nutrient cycles, was advocated as a priority area for future EU research and policy. A new economic model is proposed, recognising soil and water as public goods and investment opportunities through "Carbon and Water Banks." Policies should promote nature-based solutions, including regenerative agriculture and water harvesting, to address the disruptions in small water cycles and their impact on agricultural productivity.

3. **Food Democracy and Stakeholder Engagement:** A strong call was made for **empowering local food councils** and citizen assemblies to foster “food democracy.” Engaging citizens in local decision-making processes and supporting them with funding and authority could significantly improve the governance of food systems. More research is needed to assess the effectiveness of **multi-actor approaches** in governance, and the role of **citizen participation** in shaping local food systems must be expanded.
4. **Social Justice and Vulnerable Populations:** The transition towards resilient food systems must be socially just, ensuring that vulnerable populations are not left behind. There is an urgent need for research into **food system inequalities**, particularly in how climate shocks disproportionately affect different regions and socio-economic groups. Researchers should focus on how policy can address these inequalities, especially through **subsidy reforms** and **targeted social safety nets**.
5. **Policy Coherence and Global Governance:** The need for a long-term and ambitious vision for future food systems to guide policy coherence across EU food, agricultural, and environmental frameworks was emphasised. Participants called for more research on aligning the **Common Agricultural Policy (CAP)** with climate adaptation strategies and disaster preparedness. **Global governance mechanisms** also need attention, particularly in managing food trade during crises, and a proposal for an **EU-wide food reserve system** to stabilise supply chains in emergencies was put forward.
6. **Knowledge and education on food systems.** The group highlighted the need for investment in education on food systems and farm advice services, with a particular focus on agroecology. This would facilitate the transfer of knowledge from research to society and on-the-ground practices. They also recommended the development of metrics to measure the impact of science-practitioners' knowledge exchanges.
7. **Specific Research Needs:**
 - **Water and Soil Resilience:** Develop tools and metrics to monitor and improve the **water retention capacity of soils** at both the farm and landscape levels. Research should also focus on the co-benefits of land-based interventions like soil carbon sequestration and water management in climate adaptation.
 - **Food Systems and Climate Modelling:** Existing models are inadequate for predicting **complex climate interactions**, such as simultaneous droughts and floods. There is a need for **dynamic modelling tools** that incorporate ecosystem services, water cycles, and extreme weather events.
 - **Agroecology:** Further research is required to support the transition to agroecological practices, especially in **underfunded regions of Europe**. Studies should focus on the socio-economic barriers to adoption, including **farm debt** and access to **knowledge and technology**.
 - **Food System Redundancy:** Investigate strategies to enhance the **redundancy of food systems**, focusing on diversified supply chains, alternative proteins, and local production. This research should also explore **policy tools** for reducing dependencies on global markets and preventing speculation in food markets during crises.

- **Food Democracy:** More case studies are needed on **citizen-led initiatives** in food systems, particularly in how local food councils can influence national and EU-level policies. Research should also explore how educational programs can empower citizens to make sustainable food choices and advocate for systemic changes.

The conclusions and recommendations from the group discussions will inform the development of the EU's food security strategies, including the event hosted by Hungary during its presidency of the Council of the EU in December 2024. They will also inform broader European research agendas, particularly the 6th SCAR Foresight exercise, ensuring the development of resilient, sustainable, and socially just food systems for the future.

ANNEXES

ANNEX 1: LIST OF PARTICIPANTS

Abigail Muscat	Wageningen University and Research
Amrit Nanda	Plants for the Future ETP
Baldissera Giovanni	Euphresco
Barna Kovacs	Hungarian Ministry of Agriculture
Bettina Baruth	JRC
Bozena Podlaska	NCBR
Bram Moeskops	FiBL Europe
Chris Hegadorn	Sciences Po Paris
Christoph Müller	Potsdam Institute for Climate Impact Research
Claude Yven	FutureFoodS - ANR
Daniela Lueth	DG RTD
Elina Ovaskainen	Ministry of Agriculture and Forestry/Finland
Elodie CHAMPSEIX	IUCN
Fanny Le Gloux	DG AGRI
Francesca Bellino	FiBL Europe
Giampiero Mazzocchi	CREA
Giulia Meloni	European Commission
Heather McKhann	Inrae
Isabelle Hippolyte	Agence Nationale de la Recherche
Jean-François Soussana	INRAE
Johannes Bender	BLE
Lisa Taylor	Defra
Maria Gernert	TP Organics
Maroun El Moujabber	CIHEAM-Bari
Marta Pérez Soba	Wageningen University and Research
Martin Kováč	National trust/Slovakia
Órlaith Ní Choncubhair	Teagasc
Patricia Lopez	European Commission
Rebeca Fernandez	FoodDrinkEurope
Rolf Stratmann	Forschungszentrum Jülich GmbH
Sandra Scheffel	Federal Ministry for European and International Affairs of Austria
Tyler Arbour	IFOAM Organics Europe
Temiloluwa Daike	BBSRC UKRI
Valerie Dehaut	MESR
Vera Musch	Ministry of Agriculture, Nature and Food Quality, Netherlands

ANNEX 2 WORKSHOP AGENDA

THE FACCE JPI EVENT Brussels, September 19 2024

Time	Length	Title	Description
08:30	30'	Welcome and Registration	
09:00	15'	Introduction Background and Objectives	
09:15	15'	Getting to know participants- Ice breaker	
Session 1: Keynote presentations and discussion- Clarify issues and risks with current EU Food systems			
09:30	10'	Introduction to the presentations/focus conversation session	
09:40	1h50'	<i>Understanding current climate risks and shocks to the European agri-food systems.</i>	<p><i>Keynote speaker 1: Chris Hegadorn (20') + Discussion in small groups</i></p> <p><i>Keynote speaker 2: Bettina Baruth (20') + Discussion in small groups</i></p> <p>Panel discussion with keynote speakers and reporting from group discussions (40')</p>
11:30	15'	Coffee break	
Session 2: Keynote presentation- Explore ways in which Europe can deal with the shocks identified in first session			
11:45	45'	Analyzing priorities for European agri-food system resilience and security	<p><i>Keynote speaker 3: Martin Kováč (20')</i></p> <p>Q&A</p>
12:30	1h	Lunch break	
Interactive sessions			
13:30	1h	Fishbowl on: Reflecting on morning discussions, what is needed in terms of policy and research? Who? Where? How?	Identification of topics for group discussion
14:30	15m	Coffee break	
14:45	1h	Group Work	
15:45	45m	Reporting from the two sessions of group discussions	
16:30	30m	Next steps & Evaluation of the day	
17:00		END	