

STRESS TESTING THE EU'S FOOD SYSTEM

FOOD ALERT SIMULATION WORKSHOP REPORT

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Table of contents

03	1. Introductory letter
06	2. Background and state of play
09	3. Project overview
10	3.1 Context
	3.2 Partners
	3.3 Workshop Participants
	3.4 Technical Working Group
11	3.5 Sponsors
	3.6 Methodology
	3.7 Evaluation
	3.8 Next steps
12	4. Stress testing the EU food system in the Food Alert project
13	4.1 Stress testing as a tool for preparedness, response, and resilience
14	4.2 Food Alert stress testing methodology
15	4.3 Policy Simulations as a critical component of stress testing
17	4.4 Development of the Food Alert Crisis Scenario
19	4.5 Scenario Narratives for Policy Simulation
22	4.6 Policy Simulation workshop
23	5. Building resilience: Ideas for further consideration
24	5.1 Crisis response: Short-term measures to alleviate acute food shortages
25	5.2 Agriculture and food production: Making the European food sector more resilient and sustainable
27	5.3 Trade and Finance: Towards more resilient supply chains
28	6. Conclusions
30	Annexes
31	Annex 1: Quotes of participants
33	Annex 2: OECD Evaluation survey of participants' experience
43	Annex 3: The Food Alert Crisis Scenario

1. Introductory letter



The past several years in Europe have witnessed a set of crises that has driven widening fissures in institutional arrangements, exposed vulnerabilities in supply chains, and unearthed deep divisions between different competing visions of how best to respond and adjust to mounting challenges. The societal and economic costs of supply shocks have been staggering, but even these may pale in comparison to those foreseeable should European decision makers not urgently come together to design and direct effective and systematic responses to the rapidly escalating climate crisis.

One recent climate disaster was the massive flooding in Greece's Thessaly region where storms flooded 720 square kilometres of farmland, destroying crops, breaching hundreds of buildings, crippling the country's railway backbone, savaging rural roads and bridges, and killing tens of thousands of livestock. In all, it was estimated to have cost billions of euros. Similarly, weather destroyed hundreds of millions of Euros of food production in Italy's Po River Valley last year, linked to prolonged drought conditions. Based on present trends, Europe's climate agency predicts far worse climate-based calamities in the near future.

With such concerns in mind, the Food Alert EU food crisis simulation project was conceived by its Project Partners as a way to help bridge the gap between analysis and practical policy application by those involved in the complex process of transforming food systems to achieve globally recognised sustainability goals, including the Sustainable Development Goals (SDGs) and other relevant political commitments such as the EU's Green Deal. In short, our goal was to stress test responses by food system actors to a climate-related disruption to the food chain, to help sharpen their capacity to respond to future crises.

This report describes the nature of the Food Alert project, the Partners and supporters involved, and the results of a two-day workshop held in Brussels on February 1-2, 2024, which brought together over 60 European food system experts and practitioners, from government, industry, civil society, academia, and media and challenged them to develop practical policy responses to a fictional but realistic food crisis.

This workshop and summary report are intended to demonstrate that carefully planned crisis simulation exercises and the development of new stress testing methodologies and other related tools can be deployed to deepen awareness, generate momentum, create a community of practice,

and spark new ideas to strengthen food system resilience through enhanced multi-party engagement, communication, and collaboration. Neither the workshop nor this summary report attempts to definitively or comprehensively define the "right," or the most politically expedient, policies for European policy makers to develop and deploy to strengthen resilience of the EU food system. There was neither the time to do so over two half days, nor the expectation that participants – immersed in fictional roles they were assigned – could develop comprehensive policies on food, nutrition and agriculture that were fully cognisant and conformed to contemporary political realities in both Brussels and EU member state capitals on food, nutrition and agriculture. The complexity of food systems– in which increasingly entwined value chains span continents, link a multitude of actors and interests, and which shape and are buffeted by broader socio, economic, and environmental pressures – further precluded the distillation of creative policy ideas into robust and battle-tested policy portfolios in the time available.

The multi-faceted climate-based scenario used in the simulation was entirely based upon well-researched and documented reports, studies and news articles. While the perfect storm of these events might not have occurred simultaneously (yet) the elements are all based on reality. The fact that the workshop took place on the same day that European farmers blocked roads and lit bonfires on the streets of Brussels was coincidental, but a vivid reminder that disruptions are not theoretical. After only three days of protests, grocery store shelves in Brussels were emptied, raising questions about the resilience and readiness of large cities and communities should more serious disruptions occur in the near future. Serious planning, to include more stress testing workshops and trainings to raise awareness are needed as soon as possible to improve the preparedness of European communities to future food system shocks.

On behalf of the six Project Partners – SciencesPo, Chatham House, European Policy Centre, Centre for Systems Solutions, Prospero & Partners, and INRAE, I wish to thank all those who have supported the development and implementation of this project, including our Lead Sponsor, EIT Food, along with the Government of the Kingdom of the Netherlands, as well as participants in our Technical Working Group that included Project Partners and experts from OECD and IDDRI. I also wish to express deep gratitude to OECD colleagues for their support in surveying workshop participants, to help assess the workshop to strengthen future efforts and projects. I equally wish to thank Listening Inspires and Ms Lissia Amach for providing workshop participants with

a calming, meditative moment to help connect with nature and each other, to effectively “de-stress” from our simulated “stress test” of the EU food system. Finally, sincere thanks and gratitude for my graduate student intern, Ms Tatiana Hanks, whose dedication and hard work at every step of the process has been essential to its successful conclusion.

The Project Partners hope this workshop and this report contribute to a broadened conversation in policy circles and among agri-food businesses about preparing for future food system crises. We hope participants and readers are better equipped to address head-on the complexity of the full food chain – not just responding to the needs of producers, but rather all affected sectors, agencies and departments, not just in Brussels but across each member state of the European Union and beyond. We also look forward to working with other regions, governments, businesses, NGOs and food experts to strengthen capacities around food system crisis management through more simulations and trainings.



On behalf of Project Partners,

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2. Background and state of play



The European food system is among the strongest in the world, yet it is vulnerable to supply disruptions, as most recently described by the European Parliament's report "The dependency of the EU's food system on inputs and their sources"¹

Climate change threatens everything from the availability of fresh water supplies to the ability of our soils to continue producing sufficient, nutritious crops for the European Union's 448 million inhabitants and for its export markets.² Extreme weather can affect the EU food system directly, for example through droughts in Greece or Spain or inundations in Germany and Belgium. But given the high integration of food value chains across the globe, even climate events in faraway places can threaten food security in the EU and vice versa. Such risks have been compounded in recent years by an increasingly tense geopolitical environment, economic volatility, and deep divisions over managing the WTO-led free trade system. Consequently, international food supply chains have become more vulnerable to disruptions.³ The COVID-19 pandemic and Russia's invasion of Ukraine have provided stark reminders of the risks of overdependence on a small number of complex, globalized, and highly concentrated 'just in time' supply chains. That being said, the EU agri-food sector performed relatively well at the outbreak of the pandemic in 2020 with production, trade and price levels remaining relatively stable.⁴

But there is no room for complacency, as potentially far more severe crises can be anticipated to hit the European food system in the future, originating from a wide variety of sources – armed conflict, pandemics, blockages of strategic 'choke-points' in the global trading system, and – most certainly – from rapidly changing and increasingly severe weather patterns. The complexity of food supply chains, intertwined with other industrial ecosystems such as transport and energy, is further complicating the ability to react to crisis situations. Due to these interdependencies a disruption in another economic sector can also result in disturbances in the food chain.

Given such a wide range of challenges, the global development community has broadened the focus of policy attention and investment beyond "food security" toward broader notions of inter-related "food systems" and systemic transformation to achieve the sustainability ambitions of the 2030 Agenda for Sustainable Development.⁵ This broader scope and a "systems" agenda have been adopted within the United Nations Framework Convention on Climate Change (UNFCCC) process and is being developed and refined within the UN and Bretton Woods institutions that are responsible for food, agriculture, nutrition and environment. However, the process is slow, with governments challenged to comply with international commitments on climate, biodiversity, desertification, health, water and other developmental objectives simultaneously. Meanwhile, food continues to be produced in abundance, albeit in an unsustainable manner and with varying nutritional value. It is also distributed unequally.⁶

Within the global risk landscape, EU food supplies have significant external dependencies and vulnerabilities. For example, 76% of EU oilseeds for animal feed is imported. For some imported products, the EU relies on a limited number of sources. 85% of soya imports originate in only three countries, while inputs like fertilisers or chemicals, are imported from a few neighbouring countries.⁷

76% OF EU OILSEEDS FOR ANIMAL FEED IS **IMPORTED.**

85% OF SOYA IMPORTS ORIGINATE IN **ONLY THREE COUNTRIES.**



¹ Loi, A. et al. (2024). Research for AGRI Committee – *The dependency of the EU's food system on inputs and their sources*, European Parliament, Policy Department for Structural and Cohesion Policies, Brussels.

² European Environmental Agency (2024). *European Climate Risk Assessment*. Banerjee, C., Bever, L., Garbers, H., and Saner, P. (2024). *Changing climates: the heat is (still) on*. Swiss Re Institute.

³ Riekeles, G. and Swieboda, P. (2024). *Europe's make or break moment: Putting economic security at the heart of the EU's 2024-2029 strategic agenda*. Discussion paper. European Policy Centre.

⁴ Montanari, F., Ferreira, I., Lofstrom, F., Varallo, C., Volpe, S., Smith, E., Kirova, M., Wion, A., Kubota, U., Albuquerque, J.D. (2021). Research for Agri Committee – *Preliminary impacts of the COVID-19 pandemic on European agriculture: a sector-based analysis of food systems and market resilience*, European Parliament, Policy Department for Structural and Cohesion Policies, Brussels.

⁵ United Nations (n.d.). *Sustainable Development Goals. The Sustainable Development Agenda*.

⁶ FAO, IFAD, UNICEF, WFP and WHO. (2023). *The State of Food Security and Nutrition in the World 2023. Urbanization, agrifood systems transformation and healthy diets across the rural-urban continuum*. Rome, FAO.

⁷ European Commission (2021). *Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Contingency plan for ensuring food supply and food security in times of crisis. COM(2021) 689 final*. Brussels.

In recent years, food security has moved up on the EU's political agenda as greater self-sufficiency in food is seen as a crucial building block for a more resilient continent in general. Food security now lies at the heart of the EU's strategic concerns as recognised by the European Commission's 2021 "Contingency plan for ensuring food supply and food security in times of crisis" and in its 2023 economic security strategy.⁸ The links between food system resilience and climate change is particularly strong both to preserve conditions for continuity of food production despite climate volatility and because climate friendly agricultural production can also contribute to more resilience. Meat production for example is not only highly greenhouse gas intensive, but is also resource inefficient and, in many cases, livestock value chains are prone to more disruptions than those of protein alternatives.

More resilient food production is also linked to Europe's digital transition. Data and digital solutions can help make European farming practices, food processing and logistics more efficient, sustainable and resilient. Examples are mapping agricultural land and input needs through satellite imagery and AI or the use of sensors, the Internet of Things (IoT), drones, and robots in optimising the use of pesticides, fertilizers, water, and other inputs (precision agriculture). Altogether, greater self-sufficiency in food is a crucial building block for a more resilient continent in general.⁹

The EU has taken steps to increase the overall resilience of its food systems and strengthen its crisis response capacities. In addition to dedicated crisis response chapters in existing policies such as the Common Agricultural Policy (CAP), the Common Fisheries Policy (CFP) and the General Food Law, the EU developed a contingency plan in 2021 as part of its Farm to Fork Strategy, to ensure food security in times of crisis.¹⁰ The plan aims to ensure a sufficient and varied supply of safe, nutritious, affordable, and sustainable food to citizens at all times. It outlines areas for improvement that were identified during the Covid-19 pandemic, presents key principles to be adhered to in times of crisis, and introduces a European Food Security Crisis Preparedness and Response Mechanism (EFSCM) to prepare for and respond to crises. Following Russia's invasion of

Ukraine, the Commission also developed financial measures to support EU farmers most affected by higher input costs and the closure of export markets, for example by facilitating state aid.¹¹ Nevertheless, systemic resilience to shocks to European food systems is fairly under-developed, and should be systematically evaluated, to identify areas of highest risk, to lower cost thresholds of climate damage from severe weather events and foster more opportunities to strengthen crisis preparedness and response. The EFSCM represents an important tool for more systematic foresight, risk assessment, and monitoring of different food value chains at the European level.

To promote resilience, stress testing of food systems at regional, sub-regional, national, or city level and across value chains can also serve as an important preparedness and response tool. The lessons learned from stress testing exercises can help ensure adequate flow, availability, and affordability of food and the agricultural inputs needed to grow it. The Food Alert crisis simulation workshop reflects the desire of the Project Partners to address these needs and to provide an important contribution to building stronger, more resilient food systems in Europe and beyond through a new stress testing methodology.

⁸ *ibid.*; European Commission (2023). *Joint Communication to the European Parliament, the European Council and the Council on "European Economic Security Strategy"*. JOIN(2023) 20 final. Brussels.

⁹ INRAE. (2023). *Towards Healthy and Sustainable Food Systems*.

¹⁰ European Commission (2021). *Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Contingency plan for ensuring food supply and food security in times of crisis*. COM(2021) 689 final. Brussels.

¹¹ European Commission (n.d.). *EU actions to enhance global food security*.

3. Project overview



3.1 Context

The idea to create a crisis simulation project focusing on the resilience of Europe's food system started – as many such projects start – with a seemingly simple request for advice and unanswered questions about European food system policy formulation. Specifically, the question was whether any recent, open-source material was available on crisis simulations linked to the transformation toward sustainability of the European food system. After a fairly exhaustive search, the result was a clear “no.” Few, if any, of the major European policy think-tanks or research organisations dealing with food systems were focused on crisis simulation as a tool for preparing governments or their staffs to respond to climatic and other growing risks to the food supply. Hence was born the Food Alert project – privately financed with a small budget, back-stopped by a small group of interested organisations dealing with food and agriculture and supported with research and expertise by a handful of top technical experts.

3.2 Partners

Key to the success of such a project was finding a group of dynamic organisations willing and capable of taking the risk of doing something innovative around the concept of stress testing food systems – even before funding was identified to cover staff time and overhead costs. Starting with the Centre for Systems Solutions (CRS), a Polish-based social simulation firm who had been deeply involved in the EU-Horizon funded “CASCADES” project that looked at cascading risks to European society from climate change. The project centred on a mix of technical applications with the policy expertise and simulation experiences, one of which took place at Chatham House in London. Building on that, Prospero and Partners – a boutique, Paris-based consulting firm involved in supporting the food and agriculture industry – along with the Brussels-based European Policy Centre, the French research consortium INRAe, and Sciences Po Paris’ Chris Hegadorn complemented the team with both policy and industry expertise that proved invaluable in developing a simulation that captured the breadth and depth of the European system. Also key to the successful implementation of the project was an ongoing dialogue and productive collaboration between project partners and senior staff within the Commission’s Agricultural Directory (DG AGRI), to foster relevance to ongoing policy deliberations and regulatory developments within the EC.

3.3 Workshop Participants

Participants were selected with the aim of ensuring a multi-stakeholder, public and private, representation, including senior staff from the European Commission and Cabinet staff, senior experts from five European member state governments (Netherlands, Germany, Hungary, Spain, and the Nordic Council representing five countries), the City of Milan (representing the Milan Pact of Cities), industry (including producer and trade groups), civil society (including academia, consumer groups, and NGOs), and a handful of leading food/agriculture journalists. For the final working session, two senior European Commission officials (Acting Deputy Director General of DG AGRI, Pierre Bascou, and Florin Urseanu, Head of Unit at the Secretariat General) were invited to receive readouts/summaries of the policy-related portion of the workshop, and to provide their feedback on the various ideas and proposals raised. The workshop was conducted under Chatham House rules, to ensure participants were comfortable speaking openly about their views on EU policies and governance.

3.4 Technical Working Group

To build the technical scenario behind the crisis simulation, the project relied upon a “Technical Working Group” that was composed of expert staff from the six project partner organisations, and supplemented by expert input from staff of the OECD and Paris-based IDDRI. This group met online four separate times, led by the Science Director of CRS (Piotr Magnuszewski), and validated the well-researched assumptions and linkages that lay at the centre of the climate-driven supply shock crisis scenario. More details on this scenario and the methodology for creating this scenario are contained in [Annex 3](#) of this report.

3.5 Sponsors

The lead sponsor of this project is EIT Food, whose mission is “to invest in projects and organisations that aim to deliver positive impact at speed and scale, to drive change through collective learning and intervention, and to promote inclusive systems innovation.” Consistent with that mission, EIT Food played a critical role in providing ideas for workshop participants, offering useful feedback on the Brussels food policy environment, and in amplifying the visibility of Food Alert in social media and other channels. Similarly, the Agriculture Ministry of the Government of the Kingdom of the Netherlands has been a strong supporter of the concept and conceptualization of the project, offering graciously to host an event to publicly release this report. Dutch expertise and leadership on food and agriculture policy has been particularly useful in terms of designing the scenario of the crisis simulation.

3.6 Methodology

Apart from the climate disaster scenario developed by the Technical Working Group, the workshop depended on several other elements to facilitate an effective experience, including a custom-designed, interactive mobile-phone application, three short videos that described various stages of the fictional food crisis, and expert facilitation in the three individual breakout groups into which workshop participants were divided.

3.7 Evaluation

To ensure an objective analysis and evaluation of the project, OECD prepared an anonymous survey of workshop participants, which is described in detail in Annex 2 of this report. Roughly, one half of participants responded to the survey, ensuring a valid cross-section of views, including constructive criticism which will help with improving future projects and simulations.

3.8 Next steps

With the public launch of this report, the Project Partners intend to continue looking for opportunities to further develop the stress testing methodology that was developed for Food Alert – whether for regional, national, local, or industry/supply-chain level. Convinced that stress testing has tremendous value, if performed and acted upon properly, partners believe there is much more work to be done to bring this kind of policy tool to various communities, to strengthen the resilience of food systems around the world. Media coverage of the project has been strong and continues to attract attention in various circles. The Project Partners are happy to engage with anyone interested in collaborating on this topic. The OECD will present a paper on examples of policies to strengthen resilience and will use the Food Alert project as one such example to be presented to its membership in May 2024.



4. Stress testing the EU food system in the Food Alert project

Chapter 4 provides an overview of the new stress testing approach that was developed in the Food Alert project, including its components and application in the workshop for the food security experts and practitioners. Section 4.1 provides a short overview of the stress testing concepts in different fields including policy stress testing. Section 4.2 provides an overview of the Food Alert stress testing methodology. In section 4.3 policy simulations are described and its role in eliciting expert knowledge is explained. The role of a crisis scenario is clarified in section 4.4 and the derived scenario narratives are outlined in section 4.5. Finally, the policy simulation workshop that put the Food Alert stress testing approach into practice is described in section 4.6.

4.1 Stress testing as a tool for preparedness, response, and resilience

Stress testing is a tool utilized in many disciplines, e.g., construction, pharmaceuticals, finance, and critical infrastructure. Given its extensive application, stress testing encompasses diverse definitions and methodologies tailored to each domain's unique context. For instance, in the policy-making context, stress testing can be defined as "a method for testing policy, strategy, or project objectives against a set of scenarios to see how well the objectives stand up to a range of external conditions"¹² while in the finance sector, it is defined as an endeavor to "identify plausible stress scenarios to which banks could be exposed"¹³. Across various disciplines, the primary objective remains consistent: to evaluate the resilience and robustness of a structure or system (or part of a system) by subjecting them to crisis scenarios (often with multiple shocks). Through incorporating elements of discussion or debate within a wider audience, stress testing provides an opportunity for practicing anticipatory thinking, preparing for unforeseen futures, and thereby enhancing participants' ability to make informed decisions in uncertain environments. The stress testing approach has been recently proposed to strengthen the EU policy impact assessment,¹⁴ see Exhibit 1.

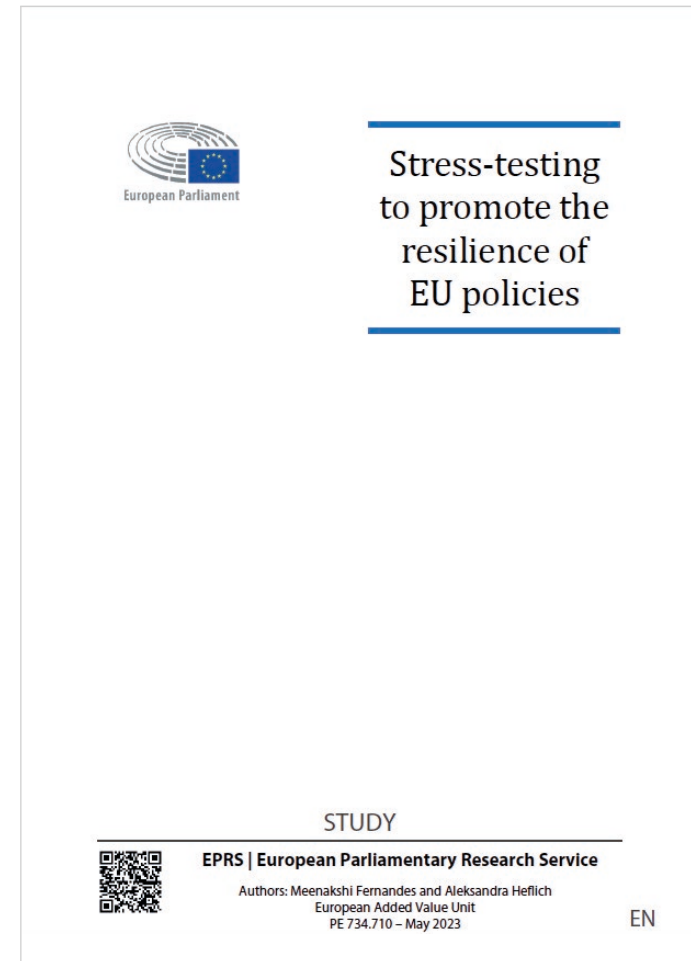


Exhibit 1 • The report demonstrating the application of the stress testing concept to the EU policy area.

¹² Government Office for Science (2017). *The Futures Toolkit: Tools for Futures Thinking and Foresight Across UK Government*.

¹³ Berkowitz, J. (1999). *A coherent framework for stress-testing*.

¹⁴ Meenakshi, F., & Aleksandra, H. (2023). *Stress-testing to promote the resilience of EU policies*.

4.2 Food Alert stress testing methodology

The methodology developed by the project team builds on the general understanding of the stress testing concept but adapts it to food system security and incorporates the social learning process¹⁵ by using the policy simulation approach¹⁶ - an experiential process where participants co-create desired future pathways.

The Food Alert stress testing methodology is presented in Figure 1. The unit of analysis that is undergoing a stress test is the whole EU food system including its connections with the external food markets. This methodological choice increases the level of complexity (as compared to stress testing of a single policy) that needs to be tackled, however, such a holistic treatment is necessary to unfold potential serious risks at a system level that could be missed by more fragmented approaches.

This inherent complexity requires a broad stakeholder engagement¹⁷ in an interactive format (two-way knowledge transfer). This has been achieved by designing and applying the Food Alert policy simulation that served as an exploratory and learning environment, driven by an evidence-based crisis scenario, for pinpointing vulnerabilities and existing exposures within the EU landscape.

The Food Alert crisis scenario provided a conceptualization of how a succession of crisis events may play out driven by a wide range of hazards (both globally and within Europe) that may affect the EU food system. The crisis scenario was developed using the conceptual framework for cross-border impacts of climate change proposed by Carter et al.¹⁸ (see Annex 3 for a detailed description) by a group of experts from different disciplines who formed the Technical Working Group. Subsequently, the scenario was translated into a visual storyline (in the form of a video) and used to challenge another group of experts and practitioners using a policy simulation. In the simulation follow-up session, new policy ideas were brainstormed and suggested for further consideration.

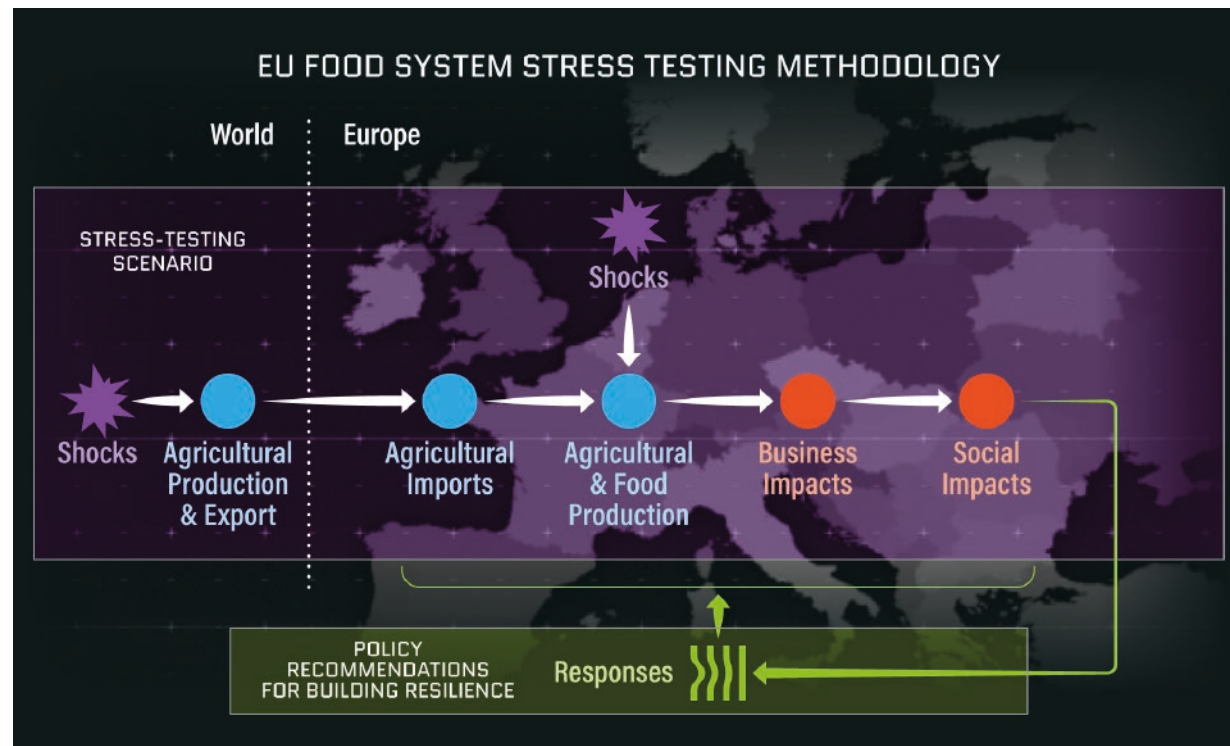


Figure 1 • The methodology for the stress testing of the EU food system

¹⁵ Reed, M. S., Evely, A. C., Cundill, G., Fazey, I., Glass, J., Laing, A., Newig, J., Parrish, B., Prell, C., Raymond, C., & Stringer, L. C. (2010). *What is Social Learning?* Ecology and Society, 15(4).

¹⁶ Mochizuki, J., Magnuszewski, P., Pajak, M., Krolikowska, K., Jarzabek, L., & Kulakowska, M. (2021). *Simulation games as a catalyst for social learning: The case of the water-food-energy nexus game.* Global Environmental Change, 66, 102204.

¹⁷ Renn, O. (2015). *Stakeholder and public involvement in risk governance.* International Journal of Disaster Risk Science, 6, 8-20.

¹⁸ Carter, T. R., Benzie, M., Campiglio, E., Carlsen, H., Fronzek, S., Hildén, M., Reyser, C. P., & West, C. (2021). *A conceptual framework for cross-border impacts of climate change.* Global Environmental Change, 69, 102307.

4.3 Policy Simulations as a critical component of stress testing

Policy Simulations, also known as policy exercises, are processes in which participants collaborate to immerse themselves in complex scenarios that mirror real-world issues, requiring policy decisions.¹⁹ The process typically involves a group of individuals who role-play stakeholders or decision-makers within a given context, representing the interests of various groups, organizations, or agencies.

Policy Simulation is an approach that uses an extended narrative layer to confront participants with a fictional yet plausible future crisis scenario, presented through a carefully crafted series of events. While the storyline unfolds, participants work to respond to the constantly changing situation. The storyline is presented using a series of professionally made videos, fictional news stories, social media posts, and other materials, such as maps or infographics.

Drawing upon existing scientific data and expert consultations,²⁰ Policy Simulations bring together diverse experts to collaboratively tackle challenges, and to engage them in collective problem-solving activities. The method serves as the platform for critical analysis to foster consensus-building and generate innovative solutions.

Policy Simulation process unfolds in the following steps:

1. Initiation

Participants enter the simulation performance room with their newly acquired roles, goals, and backstories. Within their roles, participants experience real-world like pressures (via lobbying messages), but they are free to experiment and follow their own expertise and beliefs.

2. Challenge

Participants experience a challenging crisis that can be played out at the local, regional, national, or global scales.

3. Negotiations and Policy Development

Immersed in their roles, participants engage in dialogue about different ways of apprehending the problems. They discuss solutions such as new policies, changes in governance, or specific projects and investment decisions. They create pathways towards different futures - some of them more desirable than others.

4. Bridging with the real world

After intensive negotiations and experiencing the perspectives of other stakeholders, participants drop their roles and leave the performance room with diverse new insights and ideas. In the debriefing, the assumptions used for the simulation are revealed, and experiences are shared between participants. The learning and insights from the simulation experience can be applied to improve the real-world situation by proposing new policy propositions and governance improvements.

¹⁹ Peterson, G.D., Cumming, G.S. and Carpenter, S.R., 2003. *Scenario planning: a tool for conservation in an uncertain world*. *Conservation biology*, 17(2), pp.358-366.

²⁰ Adam, D. (2020). "Design fiction" skirts reality to provoke discussion and debate. *Proceedings of the National Academy of Sciences*, 117(24), 13179-13181.

Figure 2 • Policy Simulation process



Policy Simulations share the following characteristics:²¹

Problem statement

Participants encounter a complex real-world problem, demanding collaboration, inventive solutions, and the use of diverse data.

Different perspectives

The simulation offers a narrative-driven depiction of the issue, linking stakeholders with varied backgrounds, values, tasks, and goals. This allows them to explore the problem from multiple perspectives inherent in the simulation roles.

Communication

Through sharing viewpoints, suggestions, and negotiations, participants foster open dialogue and facilitate communication across differing perspectives.

Complexity

During discussions, participants uncover the key interconnections, and interdependencies within the complex system and propose policy responses to the problem.

Creativity

Participants discover their creative potential as abstract ideas become tangible, opening new pathways into the unknown.

Commitment to action

After reconciling differences, participants commit to implementing their jointly developed strategy, using their expertise to tackle real-life challenges.

4.4 Development of the Food Alert Crisis Scenario

A crisis scenario is a central component of the Food Alert stress testing approach. It is provided as a challenge to policy simulation participants in step 2 (see previous section). Such a scenario should be developed based on extensive research review and consulted with experts from multiple fields. By representing a plausible future and exploiting key system vulnerabilities it can provide a solid basis for exploring possible resilience measures that can be valid in a wider set of circumstances. Ideally, a series of different scenarios should be developed and applied but it might be challenging due to financial and temporal constraints.

In the Food Alert crisis scenario, extreme, but plausible, events are set to represent the undesirable outcomes of climate impacts, political decision-making, and other socio-economic factors. It was developed collaboratively with partners from various private, governmental, and academic organizations who formed the Food Alert Technical Working Group and proceeded through a series of working sessions. By bringing together the expertise and insights of individuals from various food-related fields, these sessions ensured that the scenarios were comprehensive and realistic, covering a wide range of potential crises that Europe may face.

The scenarios initiate in four distinct geographic areas: Mediterranean (North Africa and Southern Europe), Southeast Asia (Malaysia and Indonesia), Latin America (Brazil, Argentina, and Paraguay), North America (USA and Canada), and Eastern Europe (Romania, Bulgaria, and Hungary). Each region is affected by various climate triggers which initiate a chain reaction of cascading impacts, affecting food producers, retailers, buyers, and consumers alike. While the diagram focuses on the consequences of these events for Europe, it was crucial to explore the events' origins, as their impacts extend beyond their geographic boundaries.

Figure 3 illustrates the simplified concept of the developed crisis scenario, and Annex 3 provides a comprehensive overview with a detailed description of its regional components.

²¹ Duke, R. D., & Geurts, J. (2004). *Policy games for strategic management*. Rozenberg Publishers.

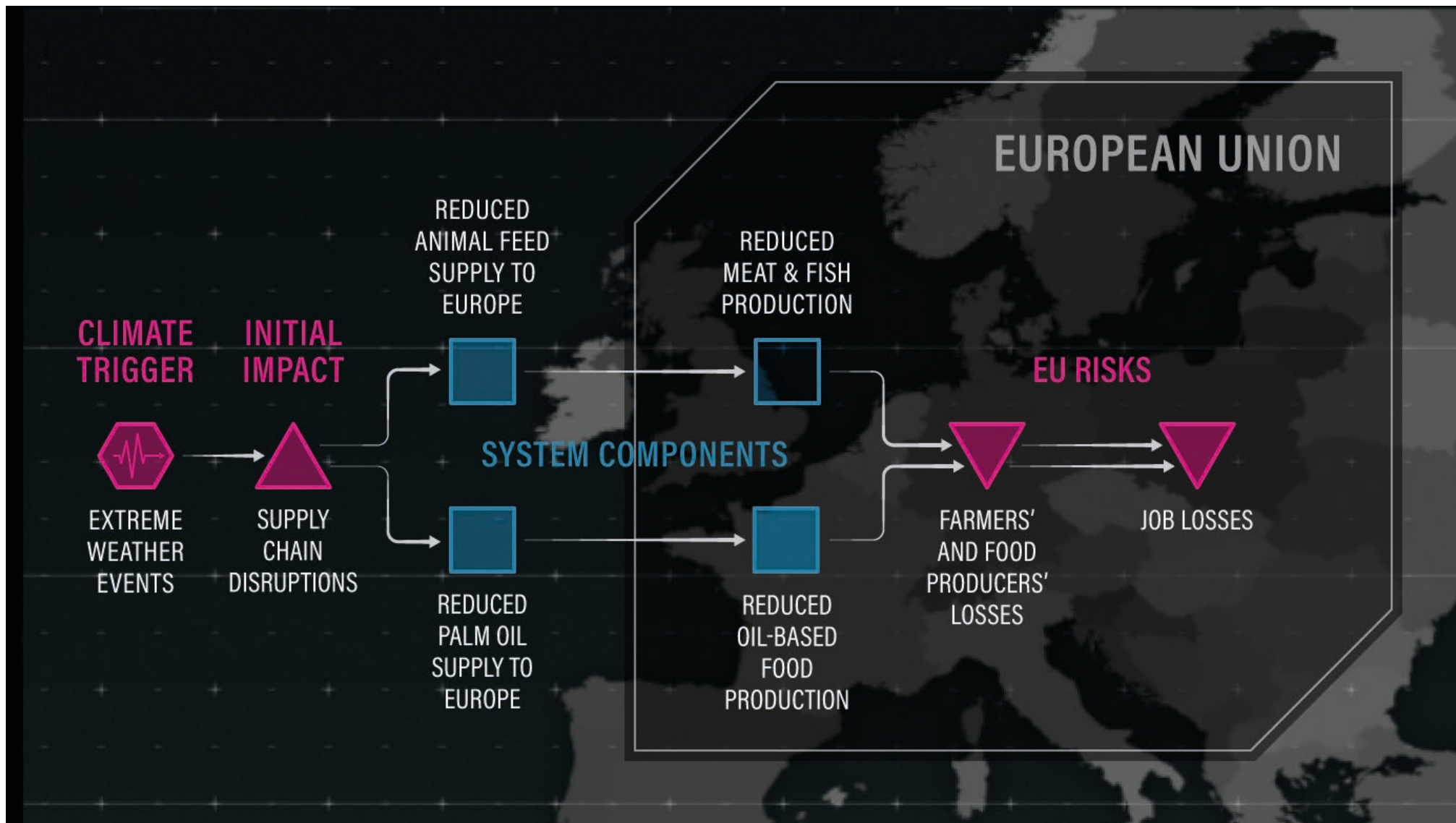


Figure 3 • The core structure of the EU food system crisis scenario

4.5 Scenario Narratives for Policy Simulation

The main narrative medium for presenting the Food Alert crisis scenario to the policy simulation participants, consisted of three consecutive videos. The videos were designed to immerse players in a hypothetical food emergency situation in the near future, guiding them through a series of unfolding events. The events were accompanied with the corresponding timelines and maps to indicate relevant geographical locations. They were stylized to mimic various formats such as news programs, documentaries, commercials, political advertisements, phone calls, and recordings of expert discussions.

Below, we present a brief overview of the crisis narrative:

Part 1:

In February 2024, South America (in particular Brazil, Paraguay, and Argentina) experiences a significant decrease in soy and maize production due to prolonged drought, heightened temperatures, and excessive rainfall during the harvest season. Consequently, the export of these commodities is disrupted. Simultaneously, there is a surge in attacks on vessels in the Red Sea and Suez Canal. By July, the Mediterranean region (encompassing North Africa and Southern Europe) grapples with an extended absence of precipitation and heatwaves. Meanwhile, China's demand for soybean and palm oil experiences a significant boost. In August 2024, the Russo-Ukrainian war triggers a sharp decline in grains and oilseeds harvest. A month later, in September 2024, ongoing weather challenges in Indonesia, along with perceived unfair treatment of small local producers by the EU, prompt Malaysia and Indonesia to ban palm oil exports to the EU. Part 1 concludes in December 2024, with Europe facing protests, riots, and the increase of right-wing parties.

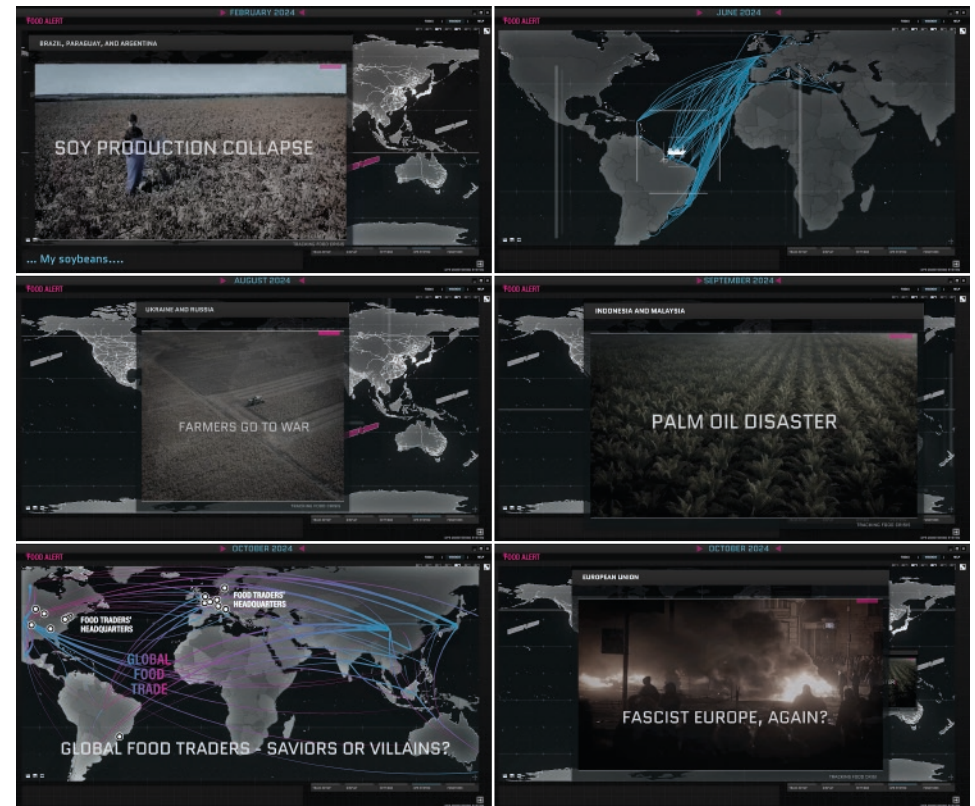


Figure 4 • Selected scenes from Video 1

Part 2:

The second part commences in July 2025, with the high-pressure "blocking" weather systems impacted by jet stream Rossby waves, triggering floods and droughts across multiple countries worldwide. This phenomenon leads to the withering of soy crops in Hungary in August 2025, the decline of canola fields in Canada in October 2025, the devastation of soybean crops in the United States in October 2025, and the destruction of maize in Romania in November 2025. Meanwhile, the Mediterranean region struggles with prolonged droughts and heatwaves. In September 2025 these anomalies result in weakened plant resistance and the spread of invasive pathogens taking a toll on local agriculture, with *Xylella fastidiosa* proving particularly destructive. Between May and August 2025, the EU experiences a mounting shortage of feed, posing increasing challenges for the livestock and aquaculture industries. Barns and fish farms encounter difficulties in securing sufficient feed, resulting in visible signs of malnourishment among the animals. Despite numerous warnings, in August 2025, the EU decides to relax border checks.

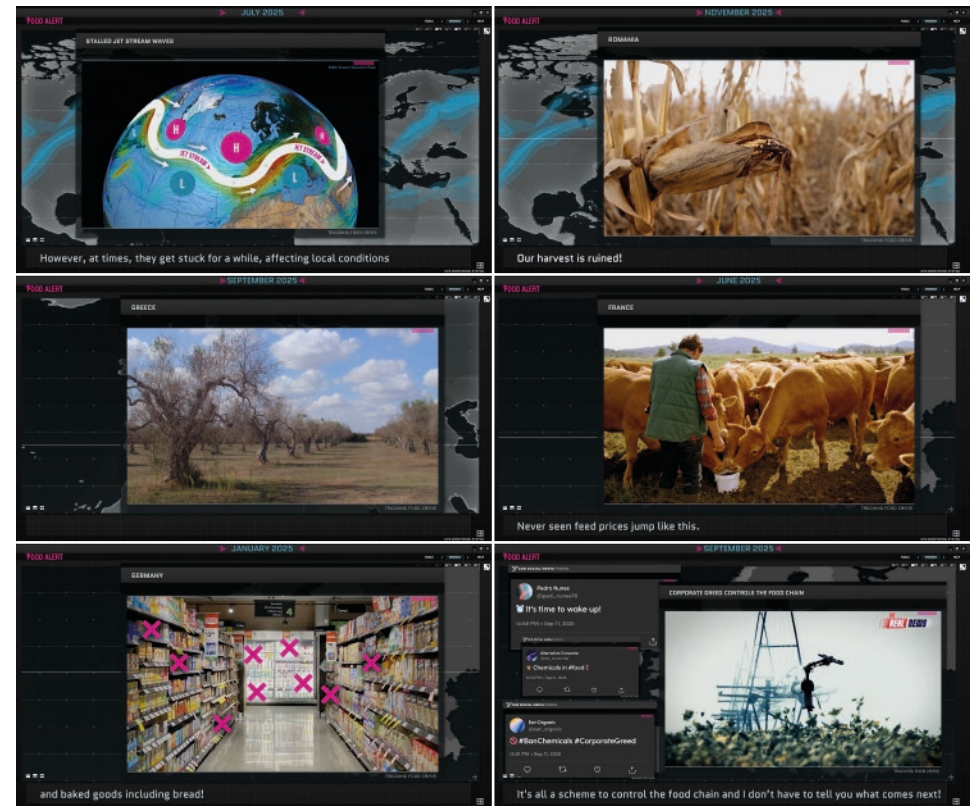


Figure 5 • Selected scenes from Video 2

Part 3:

The third narrative unfolds between October and December 2025. The beginning portrays a dynamically evolving situation in one of the shopping malls in Malta, where a desperate supermarket manager calls for help in managing customers fighting over the last cans of food. The situation quickly escalates in other places. Economic inequalities, social unrest, political instability, and violent attacks on immigrants become increasingly prevalent. Simultaneously, small farms face bankruptcy, and insurance companies grapple with mounting difficulties. In October, the unintended consequences of relaxed quality checks at EU borders become apparent as undetected contaminated animal feed passes through the EU borders resulting in widespread cattle deaths. The repercussions are severe, with reports of cattle deaths appearing in multiple regions. November 2025 is marked by a rise in protectionist measures adopted by member states, coupled with a noticeable lack of cooperation among them. There is a surge in blame-shifting among politicians, consumers, and food traders, amplified by the proliferation of fake news. Empty shelves become a norm across Europe.

The whole video 3 can be accessed [here](#)

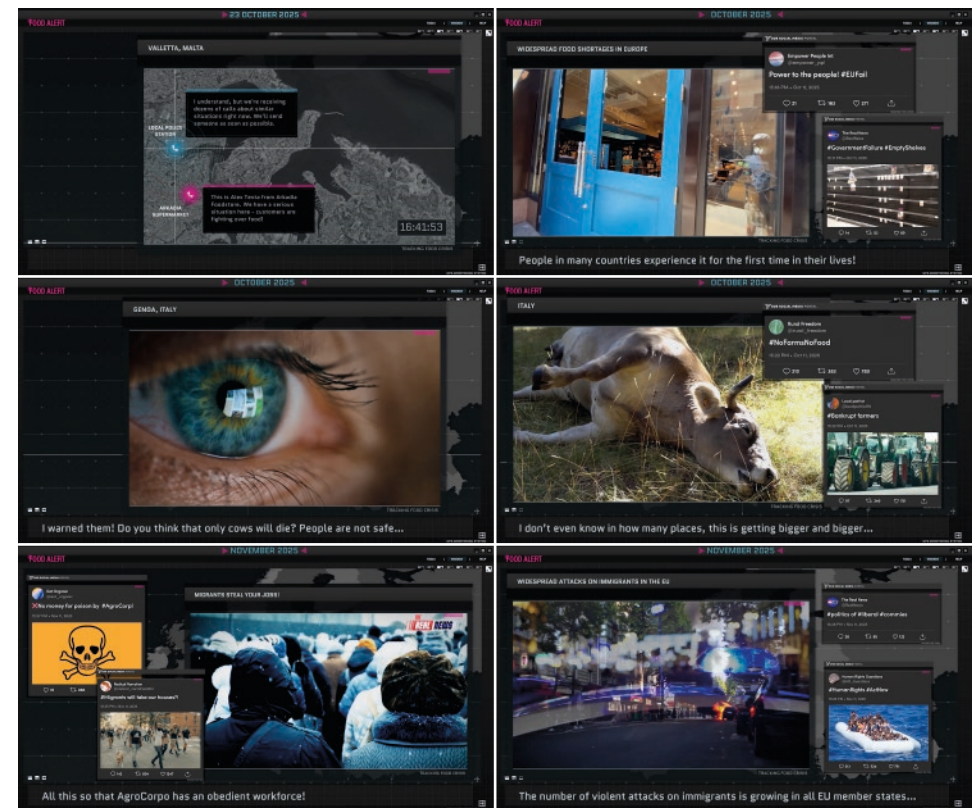


Figure 6 • Selected scenes from Video 3

4.6 Policy Simulation workshop

Policy Simulation Roles

To fully engage participants in the Food Alert policy simulation, they were assigned a variety of roles based on various worldviews and perspectives in the field of food regulation, production, trade, and consumption. The formulation of roles was informed by a thorough literature review and consultation with experts. Subsequently, the design team identified the most prevalent ideologies and used them as the basis for developing specific roles. These ideologies encompassed a diverse range of perspectives, including progressivism, social solidarity, agro-centrism, eco-modernist development, and economic rationalism. Examples of roles given to participants include governmental institutions, companies, public and private organisations such as e.g., 'Protect the Nature!', 'Watchdogs for Tomorrow', 'Green Investments Coalition', 'Rural Renaissance Alliance', 'EU Farmers Coalition', 'European Banking Association', 'Oil Plants Producers Federation', 'Rural Heritage Defenders League', 'Institute for Food Security', and 'Just Sustainability Transition Hub'.



Run of show

The policy simulation workshop presents the crisis scenario (section 4.4) in the video narrative form (section 4.5) to the participants enacting various roles (section 4.6) in order to respond to the imposed challenge. Their first response often recreates the typical real-world problems of short-term focus, decision silos, confirmation bias, underestimating uncertainty, narrow discourse range included, etc. Experiencing these pitfalls opens participants to a more systemic and participatory approach to developing solution options in the post-simulation session that is used as a platform for a discussion about contingency plans to mitigate present and future risks.

Experience-driven, collaborative development of resilience policies allows stakeholders to identify the vulnerabilities and shortcomings of their initial assumptions. The policy stress testing in the Food Alert simulation offered the invited experts and practitioners the opportunity to confront the complexity of an interconnected food system and then step back to reflect on their assumptions. Such reflection often leads to shifts in perspective among participants.

The Food Alert workshop resulted in formulation of policy ideas developed by experts and practitioners from food security-related fields that are presented in the next section.



5. Building resilience: Ideas for further consideration

The workshop participants were grouped together to produce ideas for ways out of the crisis scenario in three focus areas. The first field, Crisis Responses, looks at short-term measures to alleviate acute food shortages. The second, Agriculture and Food Production, explores possibilities of gearing the European food sector towards a more sustainable and less crisis prone production. This is about preparing for crisis in the long run. The last category, Trade and Finance, investigates how food value and supply chains could be distributed and financed inside and outside the EU to guarantee the highest possible degree of food security.

The policy ideas reflect the outcomes of the discussions and compromises among the workshop participants made under time pressure. They are therefore neither exhaustive nor do they represent a coherent plan of action. They should not be seen as a definite or as an ideal set of recommendations, but rather as the result of the Food Alert crisis simulation workshop.

5.1 Crisis response: Short-term measures to alleviate acute food shortages

Idea 1: Upscale food reserves through a new Food Allocation Reserve Management (FARM) programme

The workshop participants suggested that the EU consider a Food Allocation Reserve Management (FARM) program. This would be an initiative addressing EU farmers' resilience in food crises. With a strategic focus on animal feed and other agricultural inputs, FARM should aim to allocate a modest proportion like 5% of the EU agricultural budget (CAP) to upgrade storage facilities and create new ones across farming regions. This reserve, integral to the European Contingency Plan, should ensure rapid response during emergencies. It should be centrally coordinated but with regional organisation and responsibility for operations. By promoting international cooperation, FARM would not only fortify the EU against unforeseen disruptions in the food supply chain but also help to safeguard livelihoods and stabilise food prices.

Idea 2: Relax environmental standards for critical food products imported in the EU in times of food shortages

To ensure sufficient provision of food products during emergencies, participants suggested that EU environmental standards for critical imported food products should be relaxed, similar to the derogations for intra-EU production enacted in the wake of Russia's invasion of Ukraine.²² This would only apply to indispensable food products with adequate nutritional value. Relevant food products could be identified by a case-by-case analysis of products, based on science-based impact assessments looking at environmental, social and health dimensions. The relaxation of standards could be defined as concretely as possible and be applicable only for limited timeframes of six months for example, after which it would have to be revisited.

Idea 3: Guarantee support of vulnerable population in times of crises

To enhance social resilience and solidarity in crisis times, workshop participants suggested that the European Social Fund be topped up by a small amount of 5% for example. This additional money could be distributed across member states according to population and income distribution to support the most vulnerable ones with food purchases. The money could be distributed to people in need in the form of vouchers. Those could provide access to nutritious and healthy food which would comply with European sustainability standards and would be locally and fairly sourced to avoid long supply chains in a crisis scenario. This could be done whenever possible in compliance with Single Market rules, but in some clearly defined emergency cases, temporary derogations from internal market rules could be possible. Existing social institutions could combine the distribution of the vouchers with providing information to counter disinformation campaigns.

²² Fortuna, G., & Foote, N. (2022, July 22) [EU adopts further relaxation of environmental measures to increase cereal production](#). Euractiv.

Idea 4: Strengthen the European Food Security Crisis preparedness and response Mechanism (EFSCM)

Workshop participants suggested that the mechanism could be more flexible and more multi-disciplinary across different governance levels and policy portfolios. Currently there is one single authority as contact point at member state level with the EFSCM, which usually happens to be one relevant ministry. Given the multi-disciplinary nature of food security, contact points could be multi-ministerial and linked to national crisis centres.

To improve efficiency of coordination between the EFSCM and national authorities, similar food security mechanisms could be established on the national level, bundling experts from all relevant national ministries and other pertinent experts. This would also strengthen food security preparedness and response capacities on the national level.

Moreover, the EFSCM could further increase the diversity of its expertise, including representatives from various national authorities, including from agriculture, research, employment, environment and trade. Similarly, the EFSCM could organize joint meetings with EU expert groups on other policy fields relevant to food security, including health, justice, migration, security and disinformation. The EFSCM could also provide expert advice to the political EU level, in particular to the European Parliament and the Integrated Political Crisis Response (IPCR) of the Council in case of crises.

5.2 Agriculture and food production: Making the European food sector more resilient and sustainable

Idea 5: Identify available land and bodies of water for possible food production with a focus on protein crops

Participants of the workshop proposed that member states should be mandated within multi-annual plans (in agricultural, aquaculture, fisheries) to identify unused areas that could be allocated or repurposed for food production. This would include fallow plots, urban areas, brownfield land and bodies of water. Satellite and digital technologies should facilitate the mapping process. National mapping could feed into a strategic EU-wide allocation of potential zones for food production, which could be activated in case of need.

According to the workshop participants, priority should be given to environmentally friendly protein crops for which procedures should be facilitated and accelerated by reducing bureaucracy and requirements such as environmental impact assessments. Plant based protein products such as legumes could help decrease the EU's dependence on protein imports. Moreover, such crops require relatively little mineral fertilisers, water and air pollution compared to cattle, having a much lighter impact on the environment. The recently enacted regulation exempting farmers from keeping 4% of their land fallow in case they grow nitrogen crops like lentils, peas or favas, can be seen as following this logic.²³

Idea 6: Increase investment in food innovation, particularly in alternative protein development

A decrease of the EU's relatively high dependence on protein imports and diversifying sources of protein for feed and food, could significantly increase European food security. The European Parliament has recognised this and adopted the European Protein Strategy resolution, urging the European Commission to take action to boost protein production within the European Union.²⁴

²³ European Commission (2024, February 13). [European farmers exempted from rules on land lying fallow](#), Press Release.

²⁴ European Parliament (2023). [European protein strategy](#), European Parliament resolution of 19 October 2023 [European protein strategy](#), P9_TA(2023)0375.

Large investments could be mobilised to develop innovative plant-based protein products. Those could also include industrially produced products, given the high carbon footprint of land-based production.

Food innovation could be promoted by tax incentives stimulating the agri-food industry to make these investments directly. Additionally, a specially dedicated protein diversity innovation fund could be set up. Financing for it could be made available through the reduction of subsidies to cattle, as well as private sector investments. The money could then be invested in startups dedicated to research, development and deployment or in pertinent projects by existing food producers in the framework of the Horizon Europe programme.

Idea 7: Prioritise the use of crops for food and feed rather than biofuels

An increasing percentage of European crops are used for biofuels. This could contribute to food shortages in times of crisis. To improve resilience, workshop participants therefore proposed that protein producing crops should only be used for the production of biofuels when food demand has been met.

Moreover, oilseed for biofuel can have a vital role for the feed stuff supply and can enhance independence of the EU from import from third countries. In order not to crowd out EU food production, the final use of biofuel crops which can deliver also dual use products such as Dried Distillers Grains (DDGs) could be monitored. The monitoring would help to avoid too much of biofuel use replacing food use. Policy makers could then take action to incentivise, redirect or prioritise crops for food production including under CAP eco-schemes or alternative measures. Moreover, the EU could put in place a strong EU regulator for food neutral biofuels with the mandate to intervene in the market to ensure that production of biofuels does not come from grain crops primarily used for food production.

Idea 8: Reduce CAP subsidies for livestock and assist farmers in their transition to plant crop production

The EU is dependent on animal feed imports and 71% of its agricultural land is designated for livestock production. Workshop participants therefore suggested that the EU should reduce subsidies for livestock production as a first step to repurpose land for protein crop production and thereby making the EU food system more resilient. The reduction should be gradual starting with the most inefficient producers in terms of water usage and feed conversion. Subsidies should be kept in place in local communities highly dependent on livestock such in mountain regions, where there are no alternatives to livestock.

Subsidies could be redirected to compensate livestock farmers or support their transition to other sources of income, particularly to production of protein crops such as legumes and oilseeds. Such changes in the food supply structure could be supported by a policy to shift demand towards more plant-based diets. This could be aided by educational campaigns and public procurement.

5.3 Trade and Finance: Towards more resilient supply chains

Idea 9: Support regional food supply chains for more resilience and transparency during crises

Shorter value and supply chains based on regional production and distribution are less vulnerable to global shocks and can strengthen the resilience of overall food production in times of crisis. Regional marketing through producer cooperatives and supermarkets could bind producers to consumers and could reassure consumers that food is available, making them less prone to disinformation. Moreover, relying on local diets would contribute to a reduced carbon footprint, all while strengthening traditional local farming communities. Workshop participants therefore proposed that the development towards more localised value and supply chains should be incentivised by subsidies for locally produced food through the CAP.

Idea 10: Share risks of European farmers through an EU insurance mechanism on climate and supply chain events

To increase the resilience of European production against climate impacts and supply chain disruptions, workshop participants proposed the creation of an EU insurance mechanism. It could provide financial or in-kind assistance for those worst hit by a crisis to ensure wherever possible a quick resumption of production. Money could be channelled through the CAP, a solidarity fund, or subsidised insurances against crisis events. The mechanism should be designed to ensure that necessary adaptation to risks is not disincentivised by insurance. France has already put in place an insurance scheme for its agricultural sector which could provide important learnings.²⁵

Idea 11: Establish a joint EU purchasing mechanism

In case of global food shortages and concomitant rising prices, EU joint purchasing can be a powerful tool to increase negotiating power and acquire food more cheaply through large volume supply contracts worldwide. Apart from the price, other purchasing criteria could be sustainability and social fairness of production, depending on the urgency of demand. To this end, workshop participants suggested that leading importers of foodstuffs should form an alliance under the guidance of the EU Commission, for which the Aggregate EU mechanism for joint gas purchasing could be a model.²⁶

Moreover, they proposed that primary producers should be allowed to associate or merge in the context of a relaxation of competition rules in order to improve their market position through economies of scale. This would strengthen their capacity to purchase inputs and sell products at a better price. The conditions for such associations or mergers could be based not only on efficiency criteria but also on sustainability and social fairness.

Idea 12: Prevent excessive speculation in foodstuffs

To rein in excessive speculation, workshop participants proposed a cap that limits the volume of foodstuffs contracts that can be purchased by a single entity which is not a primary producer or buyer directly involved in the food trade. Rules for traders could be put in place to be transparent about stock levels to reduce opportunities for speculation. In case of excessive profits, a windfall tax could apply for all entities trading in agricultural commodities, the proceeds of which should be invested in increasing food system resilience, risk management tools and social justice.

²⁵ Ministère de l'Agriculture et de la Souveraineté Alimentaire (2023, March 15). *Assurance multirisque climatique des récoltes: réponses aux questions fréquemment posées*.

²⁶ European Commission (2023, April 25). *Joint gas purchasing: The Aggregate EU mechanism to increase energy security for Europe. Questions and Answers*. Brussels.

6. Conclusions



Conclusions

- More shocks to the EU food system are inevitable and coming at faster rates and shorter intervals.
- EU-level political action is urgent for effective short-term crisis response and long-term crisis prevention by making the EU food system more resilient.
- Crises represent a threat to food security but are also an opportunity to learn and improve resilience in the future. The experience of the Covid-19 crisis and subsequent EU reforms to improve food security demonstrates this.
- Stress testing, using crisis simulation exercises, is critical for identifying gaps and weaknesses in the procedural, regulatory and administrative structures currently in place, as basis for targeted measures to strengthen the European food system.
- Working across silos, between and among EU Commission Directorates, agencies, and communities of practice is essential to allow a deeper understanding of all perspectives and motivations, as well as to nurture the cross-fertilisation of ideas and solutions.
- Avoiding panic among EU citizens is essential in the wake of a crisis, to prevent hoarding, and to ensure peace and safety. Careful planning, investment, preparation, and crisis management training could make such panic less likely.
- Recent crises have demonstrated the importance of maintaining the flow of labourers and food supplies among member states and with third countries. While problems were addressed quickly, border closures seen during COVID resulted directly in panic stock-piling and other behaviours that contributed to limited access and availability for certain EU citizens. In this context, the Single Market Emergency Instrument (SMEI) is a welcome new instrument to maintain the internal market functional in times of crisis.
- Traditional and social media actors should be seen as valuable partners, to prevent the spread of misinformation and panic and create understanding for emergency measures. They can explain the core issues of food security and illuminate short-comings in the system. They can also inform and engage the public in open debate on the most effective steps to strengthen resilience of the food system to ensure food and nutrition security, in a manner that achieves key economic, social, and environmental sustainability goals.
- Provision of adequate social services and safety nets, particularly for the most vulnerable populations, is critical.
- For both short and long term, the reduction of livestock production, can be an important lever for decreasing the EU's dependence on feed imports, and using agricultural land more effectively to ensure food security. It is also important for decreasing the emission of greenhouse gases and protecting ecosystems. While politically sensitive, reducing the demand for meat could be a powerful lever to limit livestock production.
- Resilient trade links are necessary for diversifying supply and increasing economic efficiency. For this the choice of reliable trade partners becomes more important in an increasingly tense geo-political situation. Harmonisation of agri-food policy with close partners could further increase EU food security.
- Finally, the importance of approaching food security from a systems perspective is crucial to any attempt to prepare appropriately to face 'wicked' problems such as climactic shocks to the food system. This implies meaningful collaboration across Commission Directorates and national ministries, overcoming traditional 'turf battles' in the budget-setting and distribution process. An integrated food systems strategy also requires enlarging the boundaries of collaboration to actors from throughout the agri-food value chain since they are at the front lines of the difficulties.



Annexes

Annex 1: Quotes of participants

Participants impressions of the policy workshop taken after the workshop ended

What I really thought was interesting about Food Alert, and this was reflected back to me by some of the participants, was that it is a way to step outside of your own shoes and to work together on solutions that are then not attributed to one single organisation and so there's much more capacity for compromise, because it's not part of you yourself, but you still see it as something that everyone has agreed to.



Milan Petit

SEER
Project Lead

I think it was a good experience to experience this kind of simulation process, where we were quite diving deep into the food crisis. And they were very, I would say, effectively showing us what kind of interdependencies there are in the world regarding the food system, and where actually could the crisis start from, and what kind of crisis we could have in parallel at the same time, and how to deal with them.



Kati Partanen

World Farmers' Organisation
Board Member: Treasurer and Representative
for the European Constituency

It was pretty interesting to see that when you're in the room together there are differences, but there are also people who understand that changes are needed. And to see kind of, sometimes I like to think bureaucrats think behind their desks and just think in abstract terms. And here, we could really see that they were thinking: "Okay, this is what's happening to us. This is what's happening to Europe. This is what's happening to the world. This is what we need to do."



Bartosz Brzeziński

Politico Europe
Journalist

The Food Alerts Workshop has been eye-opening for me. Especially the aspect of being "forced" to take on a completely different perspective, so representing a stakeholder that you normally don't represent. That was very valuable. Also translating all these policy recommendations that you see in reports into reality, so not only reading about it but really living it, really trying to embody it in the simulation.



Isabelle Vreeke

Ministry of Agriculture, Nature, and Food Quality, Netherlands
Policy Officer

The Food Alert Simulation is a great opportunity for meeting and exchanging among colleagues from all around Europe from different spectrums of the food system, and to start thinking of different scenarios and different stress tests of our strange food system.



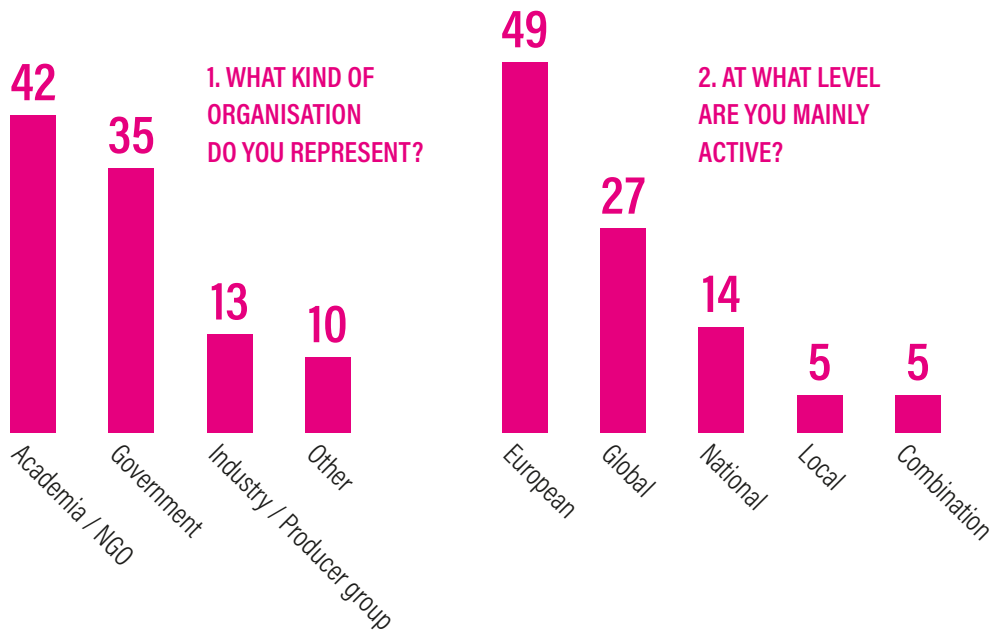
Andrea Magarini

Comune di Milano
Director of the Food Policy and Agriculture Department

Annex 2: OECD Evaluation survey of participants' experience

Evaluation survey of participants' experience: Food Alert EU food crisis simulation Workshop: February 1-2, 2024, Brussels

We received a total of 30 complete responses to the survey:



3. WAS THIS THE FIRST TIME YOU HAVE PARTICIPATED IN A POLICY SIMULATION EXERCISE OR SIMILAR EXERCISE?

For **66,7%** of survey respondents, it was **the first time** they participated in a policy simulation exercise. Some participated in similar exercises before such as:

An escape room experience built around solving soil-related problems

Foodborne outbreak simulation exercise

The Food Pathways initiative led by the European Commission: it considered food pathway options to 2030 but was less hypothetical and no role play was involved.

4. DID THE POLICY SIMULATION MEET YOUR EXPECTATIONS? WHY/ WHY NOT?

Yes / to a certain extent, the policy simulation met my expectations, because:

It also was probably the best kind of relationship building exercise I have participated in, as we remained on topic, but without people having to represent their organisations or impress others. Lastly, it was also good to develop common solutions that might not be possible due to institutional interests, but now can be presented as "a collective effort" and so doesn't belong to any particular organisation.

Yes, it was more or less what I expected. The scenario was plausible and gave the chance for fruitful discussions on many different issues.

The structure helped us develop quite a thought through policy piece in a very short period of time.

It was an interesting and innovative methodology to address possible developments, complex crisis and future shocks, with collective intelligence in small groups.

It did a good job in transporting participants into the mindset of a crisis that could potentially take place.

Very well organised, stimulated discussion and brainstorming in an informal setting. It followed a logical structure and flow that made it easy to follow and understand the rationale behind each steps, making it easy to participate and maintain interest throughout the entire duration of it. The Chatham house rules also helped the debate.

The networking aspects proved very beneficial.

No, the policy simulation did not meet my expectations; because:

I was positively surprised by having to play a role with interests from my own organisation.

For me, it was not a simulation exercise but rather a brainstorming exercise (which was fine). Simulation exercises are more specific on a specific scenario. Here, the scenario was so overwhelming that the working groups tended to fall back to generalities.

I expected the specific scenario and need to 'react' to this to be more relevant, rather than broader discussion of policies for resilience; and expected more alignment between assigned roles and actual roles.

The recommendations we reached could have been more pointed and specific, perhaps through a more structured or guided discussion.

I had interpreted the background material to mean that we would be focusing on the immediate aftermath of a food crisis and designing policy responses, whereas this disaster response element hardly played any role. Instead, the main focus turned out to be how to develop resilient food systems in the longer term which would be less vulnerable to crises. I would have better separate the crisis (immediate) response from the long term (structural) response.

This type of policy simulation could help to identify weaknesses in disaster response mechanisms, but the role-playing exercise does not necessarily add much value to the discussions on building longer-term resilient food systems. While stepping to other stakeholders' role and simulated the process to develop idea when negotiating was interesting, it is not always easy and sometimes it just strengthens the assumptions and prejudices.

I would have expected a more specific exercise, and a more in-depth discussion between participants.

No, the policy simulation did not meet my expectations; because (continued):

It would also have been helpful to meet with participants and better understand their actual organisational and personal views and positions.

The group work proved frustrating in a way as it would have been good to participate in multiple groups - especially when being the only representative of a particular bio-economy sector.

The pre-determined topics limited a bit the chance to come up with other ideas. It was nice to have sufficient time to discuss on Day 2.

Regarding the facilitation of the second day workshop, I expected the facilitator knowing the policy background better. Because this was not the case, the outcomes remained on a wish list level, at least in my group.

The policy development phase maybe would have needed more time.

I missed a type of impact analysis.

5. WOULD YOU PARTICIPATE IN A POLICY SIMULATION AGAIN IN THE FUTURE, SAY, AT NATIONAL OR SECTOR LEVEL?

93% ANSWERED **YES.**

6. WHAT ARE YOUR KEY TAKE-AWAYS FROM THE WORKSHOP AND THIS EXPERIENCE?

Participants overall had a positive experience. They found the workshop engaging, well prepared, professional, informative, and useful to connect with others, make new links and bridge ideas. They highlight that more time would have been needed.

Participants' key take-aways include:

Communication and collaboration are necessary for crisis preparedness. Crisis scenario simulation exercises are an effective stakeholder engagement tool to prepare for real crises, by bringing participants out of their own-context perspective, building understanding of the interests and priorities of other stakeholders, and aligning discussions in brainstorming sessions.

The research underpinning the simulation was highly relevant and timely, which made the scenario impactful. Hypothetically exploring a detailed policy scenario made it clear how necessarily interconnected policy discussion are.

Small groups of experts from different backgrounds and disciplines are a suitable format to develop solutions. Task forces should be representative of all stakeholders. The division of the workshop into a more macro brainstorming phase to a more precise policy formulation phase was also efficient.

Severe crises might be closer than is comfortable. Crisis preparedness is possible and can be developed by creating the appropriate environment that considers the possibility that crisis will happen, at a certain time, to a certain extent and with a certain probability.

Building resilience in food systems largely revolves into a rethinking of what we produce and consume, especially through policies addressing consumers' diets.

Participants' key take-aways include (continued):

A certain consensus of values among participants was observed. Certain solutions have become popularly accepted as relevant and effective solutions to building resilience while representing the different worldviews on how to achieve a more sustainable food production, but without necessarily being subject to critical debate. A suggested alternative format more conducive to critical reflection is an Oxford Union-style debate with speakers for and against a particular policy option to produce grounded recommendations.

The determinants for a successful preparedness and crisis response at policy level is the consideration of cascading effects that go beyond borders, all levels of government, and especially the private sector.

The presence of the Deputy DG from DG Agri and the Crisis Response Chief from SG at the debrief was useful. Better communication on activities of the European Commission (EFSCM and others) to stakeholders and consumers is needed.

Participants highlight the following challenges:

The diversity of participants made it difficult to keep the process focused on experimental learning instead of discussing high-level aspects related to trade and/or technological solutions.

Developing innovative policy recommendations is challenging given the existence of many public policies that have already been tested and implemented, the complexity of food systems, and the number of trade-offs to manage. A key challenge is to articulate urgent crisis management and longer-term action based on lessons learnt and evidence.

Although policy development is challenging and no simple solutions exist, policymakers do not seem to acknowledge that the required policy measures are already well-known.

The difficulty of policymakers to think outside the box and introduce disruption into their planning to achieve a truly systemic vision at the scale of the food system. This was reflected by the observation that some participants were not willing to "deviate" from established paths and narratives commonly utilized in the EU policy landscape in spite of the simulation of crisis scenarios. Other participants observed the tendency to prioritise simple solutions to a perceived crisis rather than engaging in more complex systemic thinking (eg. caloric intake is prioritised over nutrient balance, skill and education aspects are largely neglected, public engagement and disinformation are not prioritised, the needs of the most vulnerable populations to the crisis were less important).

The objectives, methodology and outcomes of the workshop remained unclear (eg. provide ideas to the EC for future consideration or policy reform). A final report is welcome.

7. IN YOUR EXPERIENCE, WHAT MECHANISMS OF THE POLICY SIMULATION ALLOWED PARTICIPANTS TO CO-CREATE RECOMMENDATIONS TO REDUCE RISK AND BUILD FOOD SYSTEM RESILIENCE WITHIN THE EU? AND HOW EFFECTIVE WERE THESE MECHANISMS IN DEVELOPING RECOMMENDATIONS WITH A REAL-WORLD IMPACT?

Framing questions

Several participants highlighted that "Better regulation method" (based on the 'Policy objective - Policy option - Policy measure - Policy instrument' framework) was a useful tool to discuss policy options in small break-out groups.

Good guidance and scene-setting by the organiser, including the emails received by stakeholders to shape the discussions in the first break-out group sessions were identified as useful tools.

Framing discussions through the questions "what is most important to your organisation?" and "why is it that important?" allowed to link values with recommendations.

Specific questions and a clear policy scope allow effective interaction among participants and exchange of points of view for co-creation.

Simulation and role-play

Some participants found the use of short films for the crisis scenario setting useful to get participants into a similar context and to illustrate fictional scenarios helped get into character for role-plays. However, while others thought the simulation itself was excellent and potentially productive, they found that on the day itself it did not make any specific difference or contribution to the discussions in either the role-playing discussion groups or the policy workshops.

Other participants found that the role-playing exercise was an effective tool to build trust among participants, especially at the start of the workshop.

The simulation perhaps allowed participants to break free of their usual constraints and lobby interests of view and think more flexible and creatively, although this is different in reality.

Format of break-out groups

Participants found it useful that the break-out group sessions built on each other.

While some participants agree that small break-out groups to discuss specific policies were the most productive part of the workshop, others disagree. Many participants found that smaller and diverse groups allowed discussions to be more tightly focused and allowed participants to recognise the different challenges of a crisis and to go more into depth on a specific issue that could have a real-world impact. Others found that the small size of groups limits the opportunity to contrast positions, sometimes opposed between different groups.

Pre-assigning participants into working groups and sharing suggested policy areas through the app helped focus the discussions while ensuring a wide range of topics were covered, despite limited time. However, participants found that it potentially limited the consideration of alternative outside-the-box solutions.

Drivers of co-creation

Room for self-selection of themes, voluntary participation and reporting were highlighted as characteristics that encouraged co-creation.

Similar levels of understanding and knowledge in the field among participants and are identified as prerequisites for effective co-creation.

Strong knowledge of the policy background by the facilitator is a prerequisite for relevant and strong policy recommendations.

Evaluation of real-world impact

To evaluate effectiveness, the recommendations would still need to be put to test against feasibility. Both potential impact of workshopped ideas and potential for uptake by policymakers difficult to assess.

Recommendations for longer-term policy changes require more in-depth assessment and discussion, with more tensions between stakeholders in the real world.

In terms of real-world impact, the presence of at least one participant from the EC in each group to ensure policy relevance through the confirmation of correct and updated understanding of structures and regulations.

8. IN YOUR OPINION, WHAT IS THE VALUE-ADDED OF THE IMMERSIVE CHARACTER OF THE POLICY SIMULATION IN CO-CREATING STRATEGIES FOR RESILIENT FOOD SYSTEMS?

The policy simulation is especially valuable to develop short-term policy responses to simulated events. The simulation allows participants to better project themselves into the situation, as the video clips act as emotional triggers to stimulate the sense of urgency, encouraging the participants to take the scenario seriously. The videos helped to understand both the complexity and concrete elements of the simulated issue in a very limited period of time, rather than eg. reading a story or understanding a complex cascade diagram. It allowed to better grasp the different stakeholders' priorities and resources constraints. Nonetheless, some participants believe that the immersive experience could be further developed, by multiplying sources of information/alerts (eg. numerous emails sent, calls, newspapers articles delivered), providing more details about the scenario.

Although some participants appreciated the work that went into the simulation, they felt that it did not have a large impact on how participants approached developing strategies for resilient food systems. They suppose it is because the simulation did not raise long-term issues such as reducing vulnerabilities.

The anticipatory aspect of the policy simulation was identified as a value added. Anticipating a situation where solutions are needed might be more useful to develop possible response options rather than once the situation arises.

Having to assume a different role is stimulating, allows you to think outside the box and engage with topics outside your comfort zone - which is positive for brainstorming and debating, given that stakeholders hold different perspectives, values and interests, and that creating coalitions takes time. It allows participants to think flexibly beyond initial biases and constructs and extend the feasibility within their own organisation. The role-play also stimulates empathy, as it forces participants to put themselves in the role of others. As a result, it was easier for participants to share and connect with others, which was identified as an additional added value. Moreover, the role-play limits the risk that proposed solutions are dismissed by dominant political groups.

The collaborative aspect of the workshop was identified as an important added value.

The added value depends on the type of user. For decision-makers, policy simulation illustrates the assumption they make and may help facilitate communication and planning. For potential advisors, the value lies in creative thinking beyond usual fixed positions and learning from the values and perspectives of other stakeholders.

9. HOW DID THE SIMULATION ALLOW PARTICIPANTS TO ADDRESS SYNERGIES AND TRADE-OFFS BETWEEN POLICY OBJECTIVES?

This remains a challenge. Given the time available to participants, it was not feasible to address synergies and trade-offs between policy objectives, since budgetary aspects of policy proposals were also left out. This could have been done in the plenary at the end of the workshop for a more in-depth exploration of potential trade-offs and synergies.

It would have been helpful to distribute copies of the cascade diagram made available in the rooms, so participants can refer to the different types of impacts of the crisis.

Small but diverse groups and role-play representing different perspectives helped for the discussion of trade-offs in individual sub-groups. It was useful to first develop policy concepts separately and then share them with others to build support.

A lack of facilitation limited the attention participants gave to the assessment of trade-offs when following the better regulation method to develop policy proposals.

10. HOW DID THE SIMULATION ALLOW PARTICIPANTS TO TAKE INTO ACCOUNT DISAGREEMENTS OVER FACTS, INTERESTS, AND VALUES DURING THE DECISION-MAKING PROCESS?

The role-playing exercise touched on value differences. Participants share the view that the workshop allowed only limited opportunity to disagree over facts, interests and values due to limited time (ca. 3 hours compared to a year in the real world). Given the number of policies discussion generally stayed high-level. Time was too limited for cross-group discussions across break-out groups, which may have allowed further discussions on facts and interests. Moreover, since the main goal was to reach an agreement on a policy proposal, disagreements were not given particular attention nor registered.

However, within break-out groups participants there was space for arguments, counterarguments, roadblocks, epiphanies in the process of developing proposals for specific policy areas. Role-play enabled some in-depth exploration of disagreements, in particular between the interests and values of different stakeholder types. The voting process helped to simulate how this might be resolved, although didn't fully capture how some interest groups may be able to challenge policy actions by other means (for instance business lobbies, or popular protests).

Having to vote on recommendations on the app allowed for exchanges of views and participants 'lobbying' for their positions.

The various "discourses" helped a lot with fleshing out some of the dominant narratives being present in the debate. However, conservative voices seemed relatively underrepresented, and some participants were not as confident in their roles, especially if they disagreed with those values.

11. HOW DID THE SIMULATION ALLOW PARTICIPANTS TO ADDRESS POLICY COHERENCE BETWEEN DIFFERENT LEVELS OF GOVERNANCE (EU, NATIONAL, LOCAL), AND BETWEEN DIFFERENT SECTORS (ENERGY OR FOOD POLICY), AND TIME FRAMES (SHORT VS LONG TERM POLICIES)?

Time was too limited to address policy coherence. The process also did not take into account fully what has already been proposed by the European Commission. This is an area for improvement in forthcoming workshops.

However, the clear presentation of the different types of roles as well as trade-offs between different options by organisers allowed to partially address it. The geographical scale of policies was not discussed. However, the food - feed - fuel aspect was well covered, potentially because the scenario put emphasis on it. Short vs long term policies was also address in the different groups.

12. PLEASE COMMENT ON THE FORMAT OF THE WORKSHOP. YOUR ANSWER CAN RELATE TO YOUR EXPERIENCE WITH THE SIMULATION EXERCISE, SIZE AND STRUCTURE OF BREAK-OUT GROUPS, WHETHER YOU FELT COMFORTABLE AND HAD ENOUGH TIME TO EXPRESS YOUR VIEWS AND ASK QUESTIONS, OR OTHER ASPECTS.

Overall participations were very satisfied with the organisation and professional management.

Participants were satisfied with the size and structure of the overall group of participants and break-out groups, and time allocation for each session.

Splitting the workshop over two days was also rated positively, as it allowed participants to be energised during each session.

On Day 1 more structure re stakeholder distribution per subgroup could have helped to ensure necessary diversity.

A narrower focus with more directly relevant expertise is recommended.

Having more time to discuss policy options at the end of the workshop would have been useful. Moreover, an "in depth" workshop should be considered for instance over two full days, given the strong expertise available in the group of participants.

A suggestion for improvement is that the app could have been used more constructively to guide the discussion by prompting through the emails. Membership could be decided randomly so that the full range of worldviews is present in each of the smaller groups.

A suggestion for improvement is to have an additional session in plenary or in breakouts of participants explaining their background, reason in attending the workshop and their particular position, interest and point of view.

Participants were overall satisfied with the quality of the facilitation.

Some participants did not feel comfortable in role playing and felt a little overwhelmed by the use of smart phones to share proposals and vote.

A type of warm-up in the role-playing groups would have helped to create a more comfortable atmosphere to be creative.

13. IN WHAT WAYS ARE THE RESULTS OF THIS WORKSHOP RELEVANT/USEFUL TO YOUR WORK?

More knowledge about views from other stakeholders as well as feasibility of different options.

More awareness of cascading risks.

The potential utility of experiential learning.

The difficulty to design public policy, the need for a systemic approach, the interest and efficiency for a collective approach on these subjects.

Preparedness can be trained even in spite of not knowing the future itself as long as the appropriate environment is created.

Organisations and societies may be able to handle single crises/shocks well, but multiple risks in a row will put coping mechanisms in question.

Some lessons can be applied in different areas of government planning for food resilience.

Participants now understand the challenges of consensus-building better than before.

Some participants felt the workshop was more targeted towards DG AGRI.

Some participants learned from the methodology, workshop facilitation practices and provide inspiration for simulation exercises in their own organisation and with partners.

The workshop was useful for networking and building a community of practice.

14. WHAT ASPECTS OF BUILDING FOOD SYSTEM RESILIENCE AGAINST CLIMATE-INDUCED RISKS WERE MISSING DURING THE WORKSHOP?

Plant disease was mentioned but animal one could also be a risk.

Cyber-attacks disrupting communication, food production, or food distribution

Water

Climate change adaptation

Reduced risk exposure and reduced vulnerability

The use of Sendai risk reduction framework

International cooperation

Logistics challenges

Instead of missing elements, more focus could help

The discussion about antagonism and trade-off between policy options

The discussion about new ideas within the present EU policies

Increasing risks of fungi due to changing climate conditions in Europe (hotter, more humid ...)

Putting harvests at risk (contamination) as well as the consumers of processed harvested products (humans, animals)

Increasing risks of invasive plants/animals and zoonoses

Possibility of changing, clustering and shifting risk patterns for heat, drought, erosion, avalanches, contamination, potentially increasing the costs of insurances against risks and less accessible

Changed behavioural patterns, e.g. violation of/non adherence to international treaties (trade, EU, common market, standards ...), as per game theory (changing assumptions in dilemmata games)

Market failure in systems surrounding the food system (e.g. input factors, transport, medic/vet, energy)

EU becoming subject to desriking/decoupling strategies of other players

The voice of farmers

The views of trading partners from developing countries

Mid and long term recommendations could have been discussed more in depth

Biodiversity failures were understated (they were addressed by the recommendations)

Rising water temperatures

Ocean acidification and changing currents

Global ramifications on fisheries and aquaculture

Nutrition

Public engagement

Insights from decisionmakers

Insights from the "sociology of crisis" to better understand how people, individually, collectively, react to crisis

Further explored or put the EFSCM mechanism in all discussion groups

New food safety hazards

A greater focus on the rights and needs of vulnerable and affected communities

Labour market topics, skills, education

Intra-EU rivalries, as well as opposing political views on how to solve problems

More resources are made available in times of crisis, and much more can be possible

Financial risks

The impact of the food system on the health of consumers, animals and environmental health

15. DO YOU HAVE ANY OTHER SUGGESTIONS TO IMPROVE FUTURE POLICY SIMULATIONS / WORKSHOPS?

A final session to discuss all policy options, since participants are all thinking of the same scenario

A shorter tighter focus around the experiential learning and focused participation

Explore fewer topics with more time available

More time for the entire workshop

The app on the phone was perhaps not necessary

A time of discussion about the different policies that have been proposed by each group

A better link between the scenario crisis and the work to be done. The simulation could have been even more developed like a theatre production, as more immersion is needed that was achieved in this workshop

To focus more on certain types of risks, and in certain categories or modalities of response

Provide a few basic elements of knowledge for the benefit of all (e.g. EFSCM) to quickly establish a level playing field

Different routines for different groups

Separate the immediate response from long term structural response. Add a third block linking the recommendations to the real world

Make sure the workshop is as inclusive as possible, taking a food systems approach and across the value chain, including retail and consumers

Impact simulation of potential impact of the results

More time and clearer templates to drive the reflection on complex concepts (many instructions were just orally "delivered" by the moderator at the beginning of the session); maybe using printed material with grids, relevant concepts can guide the discussion and deliverables in a more conducive way.

Not enough time was allocated to reporting back

Stronger facilitation on the second day

Potentially make it into a series that build upon each other, or have some other follow up apart from a report to build a community that can continue with this work

Annex 3: The Food Alert Crisis Scenario

The Cascades conceptual framework

The conceptual framework for understanding cross-border impacts of climate change proposed by Carter et al.,²⁷ focuses on understanding how a climate impact originating in one location can extend across borders, posing risks to distant, and apparently unrelated regions. It distinguishes an initial impact triggered by climate events within specific regions, followed by downstream consequences propagating through an impact transmission system, with adaptation responses spread through a response transmission system. Understanding cross-border impacts and responses necessitates recognition of various climate triggers, impact categories, transmission scales, and dynamics. It also requires understanding response targets and dynamics, as well as the socio-economic and environmental context, including factors beyond climate change. The methodology serves as a tool for identifying relevant causal relationships and understanding adaptation strategies and their broader implications within resilience planning. Additionally, it aids in assessing probable risks, identifying new avenues for mitigation and adaptation, and strengthening food resilience within the EU.

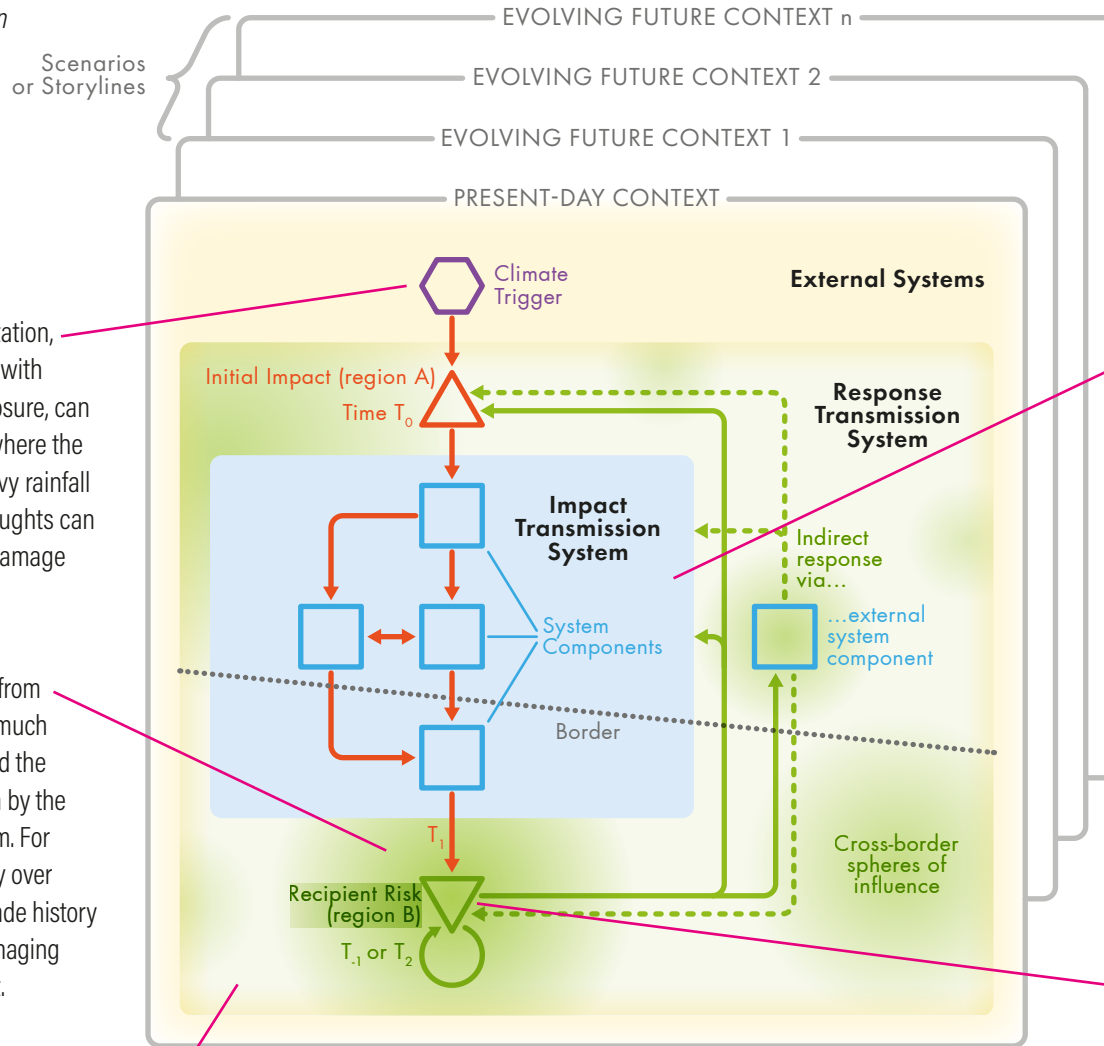
In [Figure 7](#) we provide a visual representation of the cross-border impacts of climate change²⁸ with a brief description of its components. The figure visually depicts how a climate impact (climate trigger), originating in one location, can spread across borders, posing a potential risk to a distant region. This may necessitate a response not only from actors within that region but also from those outside the location.

The Food Alert crisis scenario conceptual diagram

The Crisis Scenario diagram represents a sequence of climate change-induced interconnected triggers, impacts and events as they might unfold, considering the interdependencies within the world and EU food system. Drawing from the framework proposed by Carter et al.²⁹ the diagram portrays a plausible scenario combining global events, EU impacts, embedded in social and policymaking realities. Collaborative efforts with partners ensured that the created diagram was comprehensive and realistic, encompassing a wide range of risks and possible futures for the EU. Each of the events and its hypotheses within the crisis scenario has been meticulously crafted, based on past events, drawing from available data, news sources, current affairs, and expert insights. Despite their hypothetical nature, these events are rooted in existing evidence found in the scientific literature. The evidence used to craft these scenarios has been referenced in brackets, allowing for further investigation and a deeper understanding of the nature of shocks applied in the scenarios.

^{27,28,29} Carter, T. R., Benzie, M., Campiglio, E., Carlsen, H., Fronzek, S., Hildén, M., Reyer, C. P., & West, C. (2021). A conceptual framework for cross-border impacts of climate change. *Global Environmental Change*, 69, 102307.

Figure 7 • A conceptual representation of the cross-border impacts of climate change developed by Carter et al., (2021) with components' description.



Climate triggers, such as heavy precipitation, droughts, and storms, when combined with other factors like vulnerability and exposure, can lead to impacts primarily in the areas where the climate event occurs. For instance, heavy rainfall may flood and shut down factories, droughts can diminish crop yields, and storms may damage critical infrastructure.

A regional actor's ability to handle risks from cross-border impacts depends on how much influence it has in the impact system and the broader context. This influence is shown by the intensity of green shading in the diagram. For example, a country may have more sway over a distant trading partner it has a long trade history with, compared to a nearby country managing goods affected by a far-off climate event.

Options for addressing the recipient risk within a specific region are indicated within the green area. These responses can be categorised as:

- Reactive: occurring at time T_2 following a particular impact.
- Anticipatory: taking place at time $T_2 - 1$ in anticipation of future impacts.

Responses may aim to achieve various objectives, such as managing the risk by slowing, reducing, or preventing adverse impacts, or facilitating positive impacts as they propagate through the impact transmission system. They may also target the source of the initial impact. Responses may be focused on the point of receipt by altering local exposure or vulnerabilities to impacts that have been received or are anticipated. Alternatively, responses may be indirect, involving a third party or external system. For instance, they may involve influencing other actors to intervene in the impact transmission system or spreading the recipient risk across additional substitute systems.

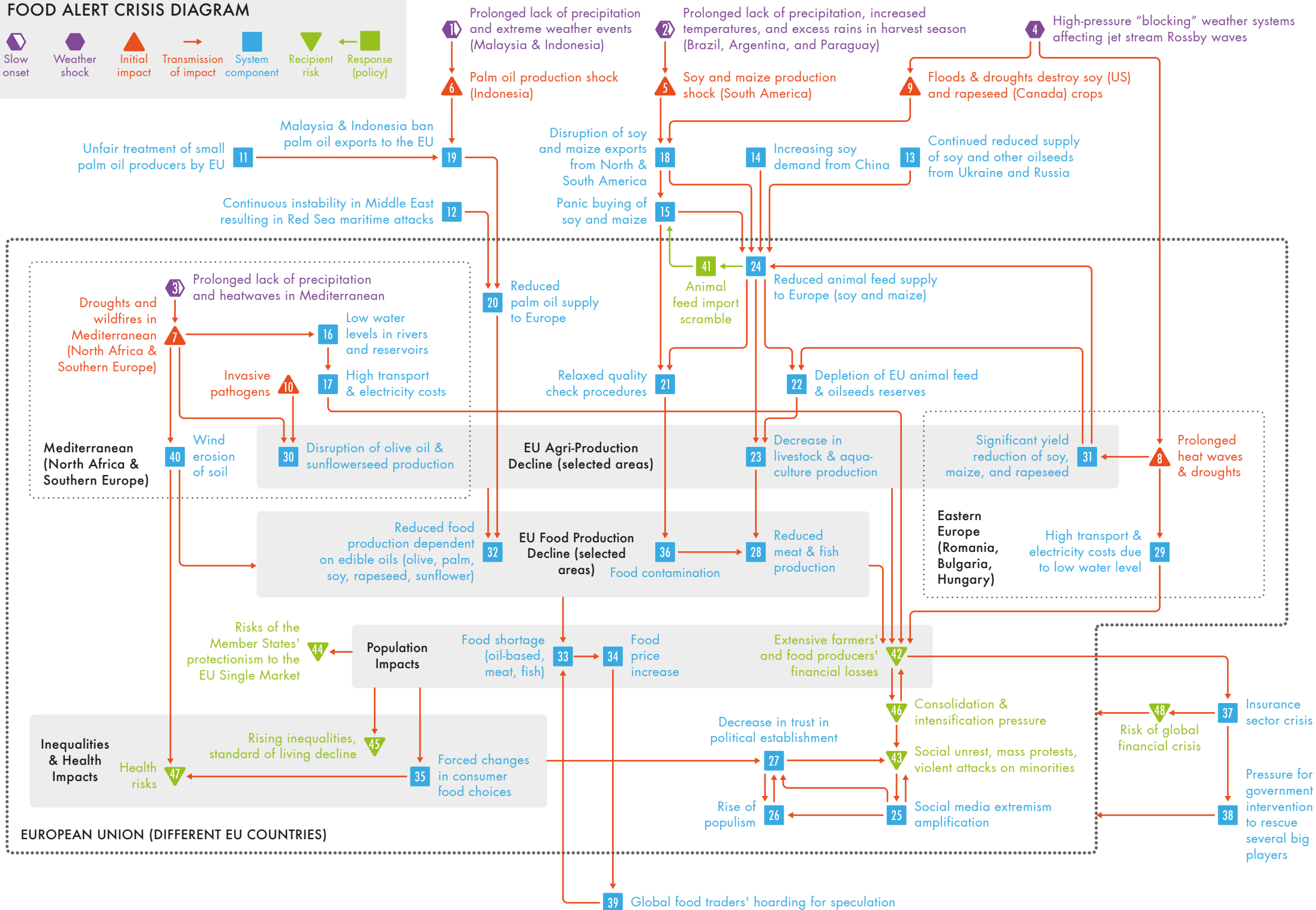
Next page: Figure 8 • Food Alert Crisis Scenario based on cross-border impacts of climate change proposed by Carter et al., (2021).

The spread of effects is referred to as the impact transmission system. For instance, diminished yields of a key crop like wheat due to drought in a major exporting region could lower the global supply of wheat and drive up prices worldwide. Government actions in the exporting country to safeguard domestic supply could further exacerbate price increases. Consequently, elevated prices may result in food scarcity in regions reliant on food imports, leading to heightened food insecurity and potential conflicts.

The mechanisms of impact transmission can be intricate, unfolding through various channels at varying speeds and impacting diverse actors across different geographic areas.

The focus concentrates on aggregate impacts transmitted into the region of interest, and defined as a recipient risk. Risks represent potential outcomes that typically have negative consequences, although they can also bring about opportunities.

FOOD ALERT CRISIS DIAGRAM



Mediterranean region

The crisis scenario's initial phase unfolds in the Mediterranean region, where prolonged droughts and persistent heat waves prevail.³⁰ These prolonged climate stressors trigger droughts and wildfires, causing depletion of water levels in rivers and reservoirs,³¹ the spread of invasive pathogens (due to stressed weakened plant resistance), and soil erosion.³² As a result, the region grapples with transportation and electricity costs due to the decreased water supply. This results in substantial financial losses for farmers and food producers. Concurrently, the proliferation of invasive pathogens directly impacts EU agriculture production by disrupting olive oil and sunflower seed cultivation.³³ This, in turn, diminishes the production of essential edible oils—such as olive, palm, soy, rapeseed, and sunflower—further increasing financial losses for farmers and food producers, and leading to widespread food shortages and price escalations across the EU region.

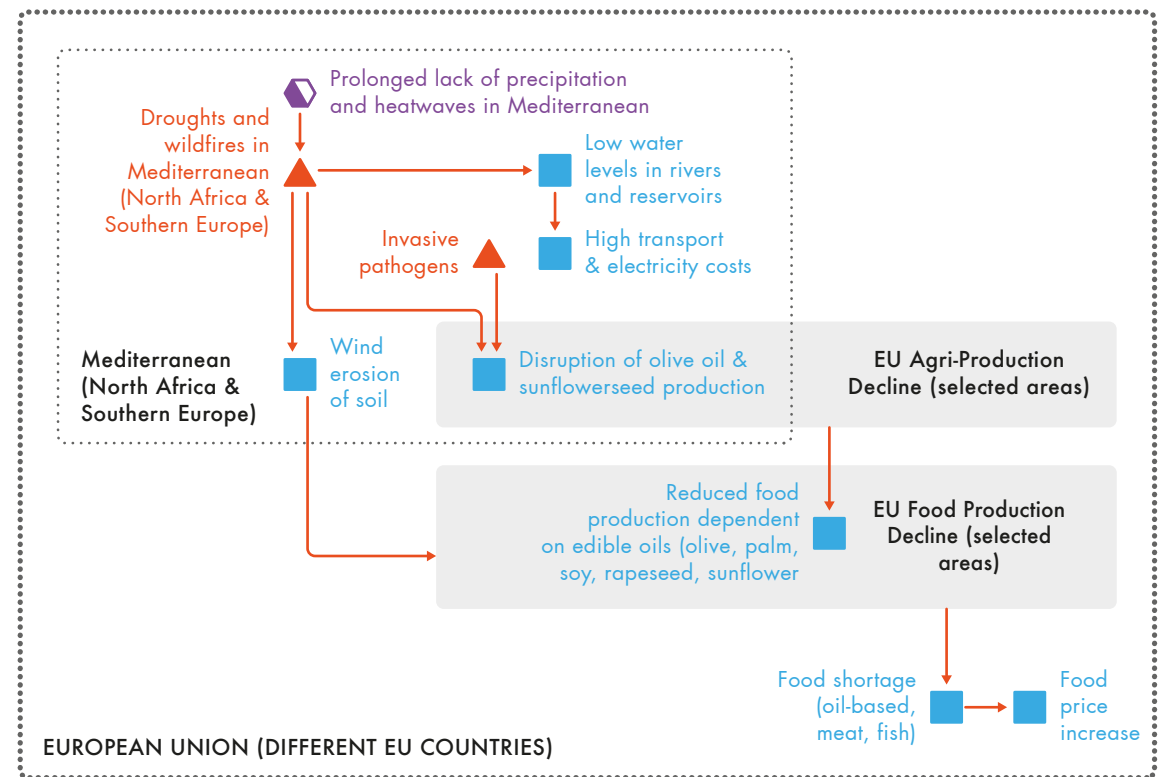


Figure 9 • Mediterranean region crisis diagram component

³⁰ Joint Research Centre. (2024, February 20). [Prolonged drought and record temperatures have critical impact in the Mediterranean](#). EU Science Hub.

³¹ Henley, J. (2022, August 13). [Europe's rivers run dry as scientists warn drought could be worst in 500 Years](#). The Guardian.

³² Lee, J., & Gill, T. (2015). [Multiple causes of wind erosion in the Dust Bowl](#). *Aeolian Res.* 19, 15–36.

³³ Schneider, K., Van der Werf, W., Cendoya, M., Mourits, M., Navas-Cortés, J. A., Vicent, A., & Oude Lansink, A. (2020). [Impact of *Xylella fastidiosa* subspecies *paucis* in European olives](#). *Proceedings of the National Academy of Sciences*, 117(17), 9250–9259.

Indonesia and Malaysia

Meanwhile, ongoing extreme weather events in Indonesia and Malaysia, characterized by a prolonged lack of precipitation,³⁴ put pressure on palm oil production in the region.^{35,36} Concurrently, perceived as unfair, the EU's treatment of local Indonesian and Malaysian producers exacerbates tensions between the biggest palm oil producers and the EU.³⁷ Frustrated by these circumstances, Malaysia and Indonesia impose a ban on palm oil exports to the EU. This causes a major shock to the food production dependent on edible oils, as palm oil serves as a critical component in numerous products.³⁸ The sudden disruption in the palm oil supply chain amplifies already existing concerns over food availability and growing prices.

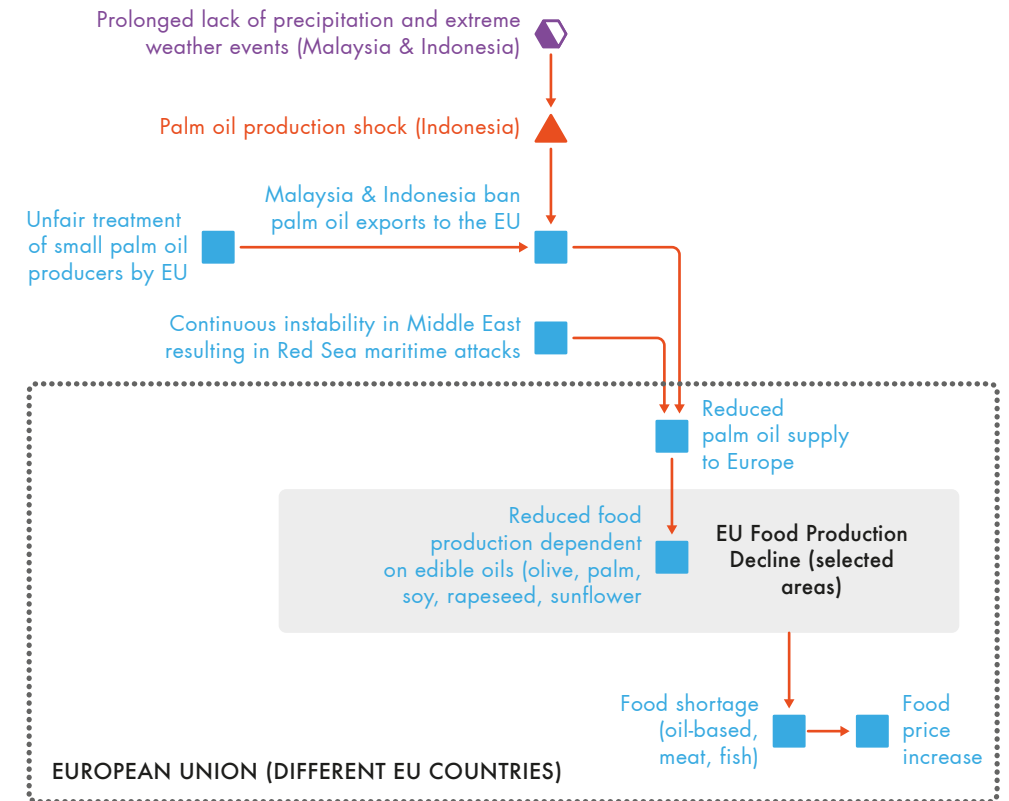


Figure 10 • Malaysia & Indonesia crisis diagram component

³⁴ Mursidi, A., & Sari, A. (2017). Management of drought disaster in Indonesia. *Jurnal Terapan Manajemen Dan Bisnis*, 3(2), 165–171.

³⁵ Ha, T. V., Huth, J., Bachofer, F., & Kuenzer, C. (2022). A review of earth observation-based drought studies in Southeast Asia. *Remote Sensing*, 14(15), 3763.

³⁶ Noojipady, P., Morton, D. C., Schroeder, W., Carlson, K. M., Huang, C., Gibbs, H. K., Burns, D., Walker, N. F., & Prince, S. D. (2017).

Managing fire risk during drought: The influence of certification and El Niño on fire-driven forest conversion for oil palm in Southeast Asia. *Earth System Dynamics*, 8(3), 749–771.

³⁷ Verdinand, R. (2019). Environmental diplomacy: Case study of the EU-Indonesia palm oil dispute. *Mandala: Jurnal Ilmu Hubungan Internasional*, 2(1), 1–21.

³⁸ Rifin, A., Feryanto, Herawati, & Harianto. (2020). Assessing the impact of limiting Indonesian palm oil exports to the European Union. *Journal of Economic Structures*, 9, 1–13.

North and South America

A prolonged absence of precipitation, rising temperatures, and excessive rainfall during the harvest season in Brazil, Argentina, and Paraguay lead to a significant shock in soy and maize production.³⁹ Meanwhile, in the United States and Canada, farmers grapple with the challenges of producing soy and rapeseed due to the disruptive influence of high-pressure “blocking” weather systems affected by jet stream Rossby waves.⁴⁰ These compound events result in the wide disruption of soy and maize exports from North & South America leading to panic buying of soy and maize. Following the panic buying trend, China and India increase their soy demand.⁴¹ Compounded with the continued reduced supply of soy and other oilseeds from Ukraine and Russia due to warfare,⁴² the EU faces a significant reduction in animal feed imports. To address animal feed scarcity, the EU relaxes quality check procedures at the borders. However, this quickly results in undetected contamination, leading to the death of animals and further reducing meat and fish production. Apart from exacerbated food shortages and increased prices, farmers and food producers face extensive financial losses, resulting in consolidation and intensification pressure.

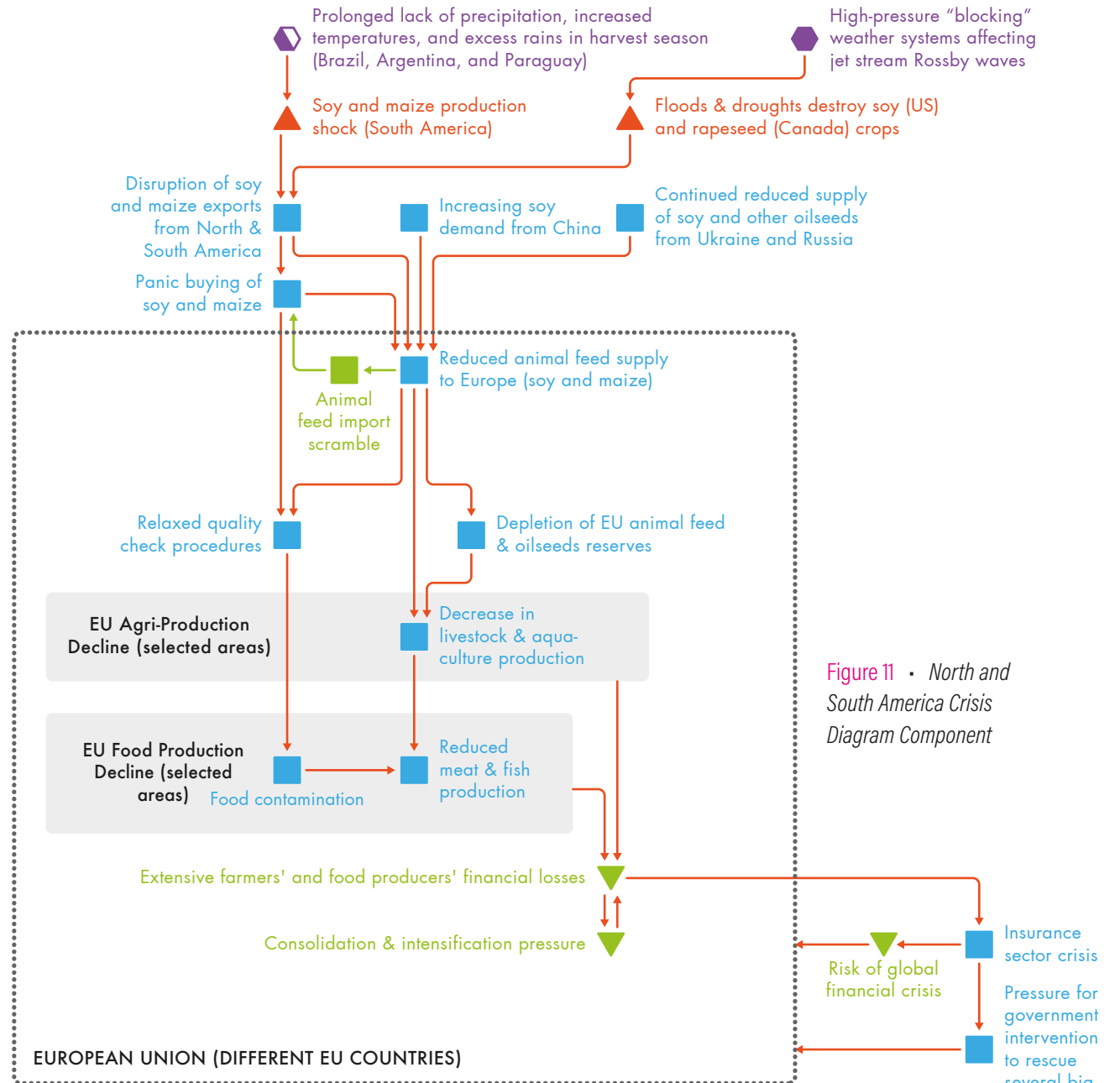


Figure 11 - North and South America Crisis Diagram Component

³⁹ Baethgen, W. E. (1997). Vulnerability of the agricultural sector of Latin America to climate change. *Climate Research*, 9(1-2), 1-7.
⁴⁰ Lupo, A. R. (2021). Atmospheric blocking events: A review. *Annals of the New York Academy of Sciences*, 1504(1), 5-24.
⁴¹ Gandhi, V. P., & Zhou, Z. (2014). Food demand and the food security challenge with rapid economic growth in the emerging economies of India and China. *Food Research International*, 63, 108-124.
⁴² Gheibdoust, H., Gilaninia, S., & Taleghani, M. (2023). The impact of the Ukraine war on the global food supply chain security: A literature review. *International Journal of Logistics Economics and Globalisation*, 10(2), 186-208.

Eastern Europe

In addition to the floods and droughts occurring in the USA and Canada, the high-pressure “blocking” weather systems affected by jet stream Rossby waves also trigger extreme weather events in Eastern Europe.⁴³ In countries like Romania, Bulgaria, and Hungary, farmers face the challenges posed by intense heat waves and droughts, which devastate their soy, maize, and rapeseed crops. This depletion of agricultural yields significantly impacts the reserves of animal feed and oilseeds within the EU. Diminished reserves contribute to a decline in livestock and aquaculture production, resulting in a reduced supply of meat and fish, along with financial losses for farmers and food producers. Moreover, the extreme heatwaves and droughts lead to increased transportation and electricity expenses, driven by low water levels and heightened demand.

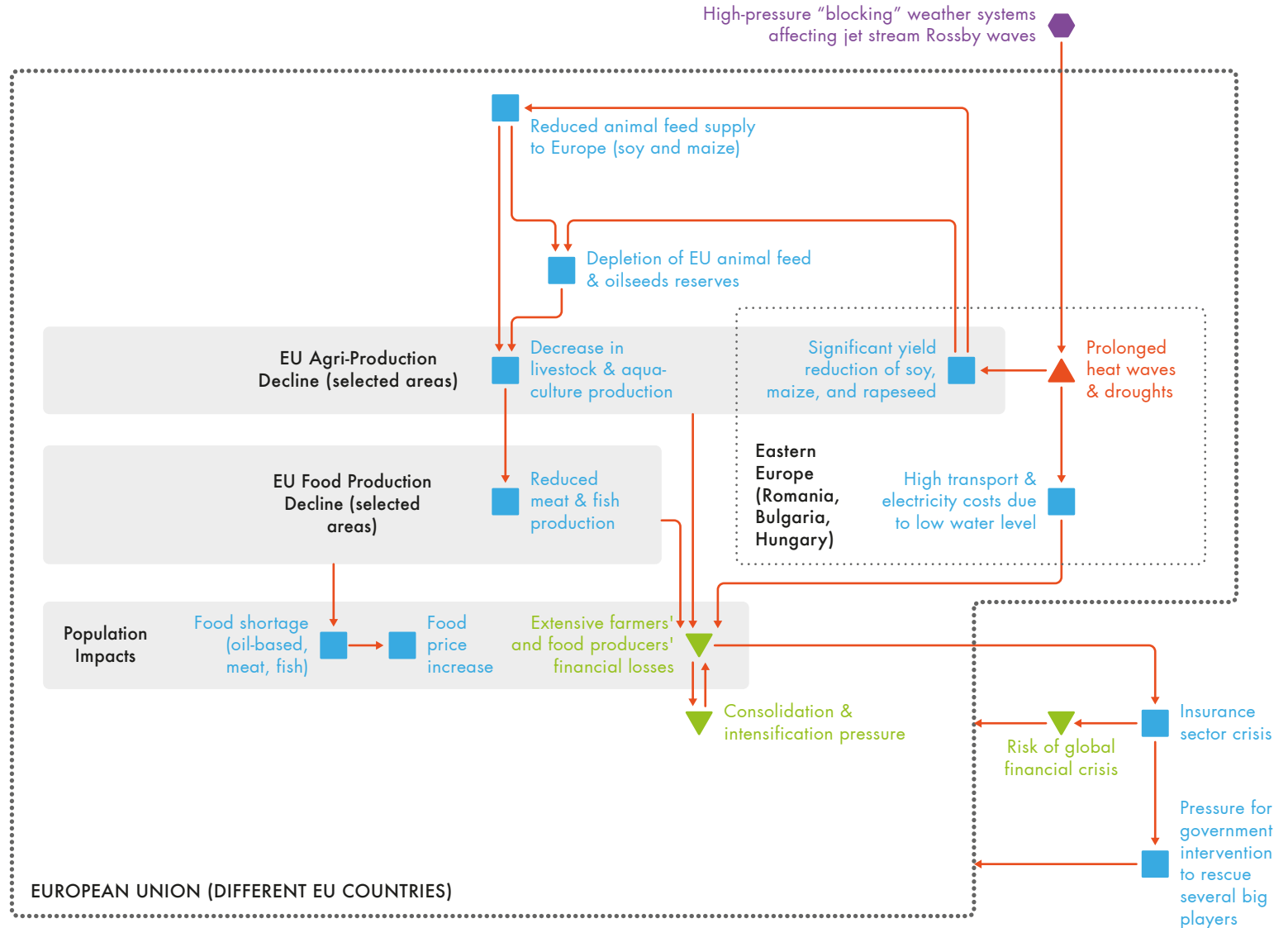


Figure 12 • Eastern Europe Crisis Diagram Component

⁴³ Lhotka, O., Kyselý, J., & Farda, A. (2018). Climate change scenarios of heat waves in Central Europe and their uncertainties. Theoretical and Applied Climatology, 131(3), 1043-1054.

Apart from direct impacts on food systems due to the decline in the EU's food imports (olive oil, sunflower seed, palm oil, soy, maize), coupled with reduced EU production (olive oil, rapeseed, soy, maize), the disruption in the food supply chain causes major political, economic, health, and societal repercussions.

Political:

- risks of the Member States' protectionism to the EU Single Market,
- pressure for government intervention to rescue several big players,
- global food traders' hoarding for speculation.

Economic:

- risk of global financial crisis,
- rising inequalities, and the standard of living decline,
- extensive farmers' and food producers' financial losses.

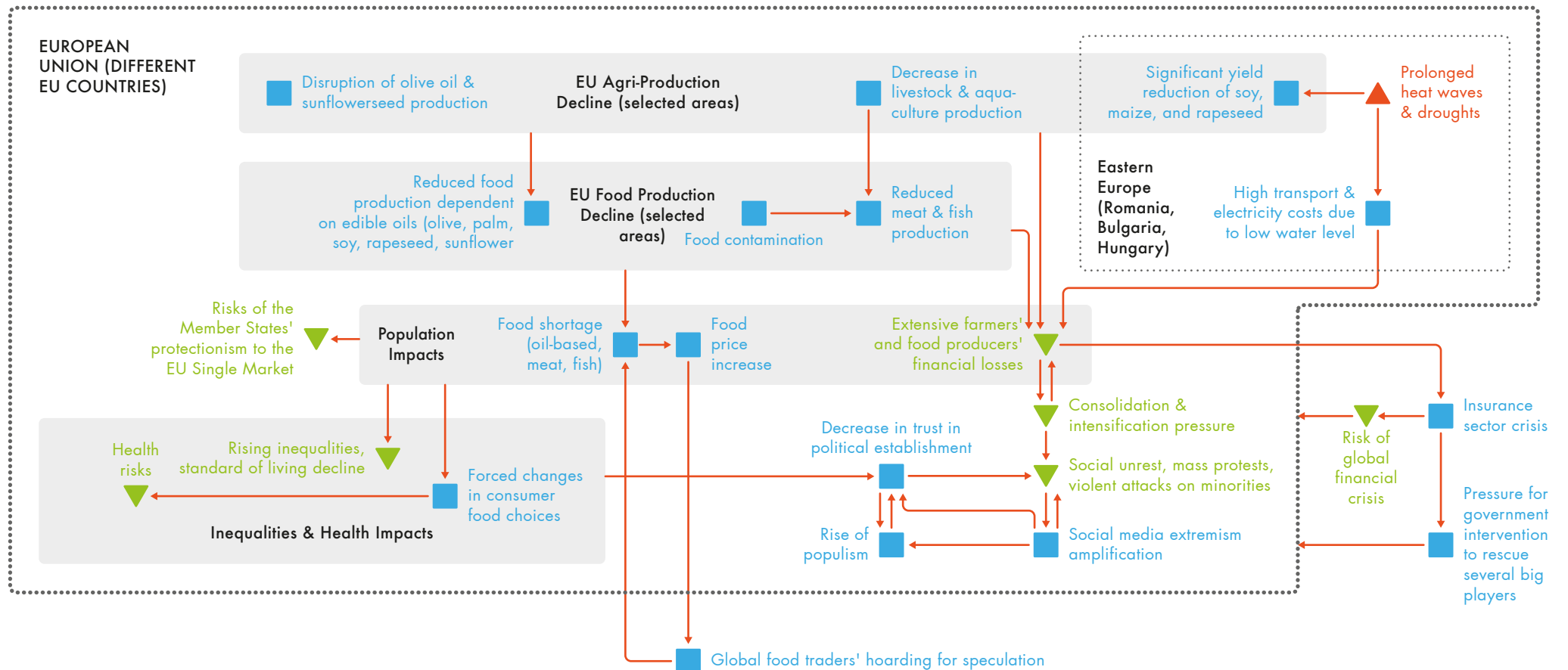
Social :

- disruption of social cohesion,
- social unrest, mass protests, violent attacks on minorities,
- social media, extremism amplification,
- rise of populism,
- decrease in trust in political establishment.

Health:

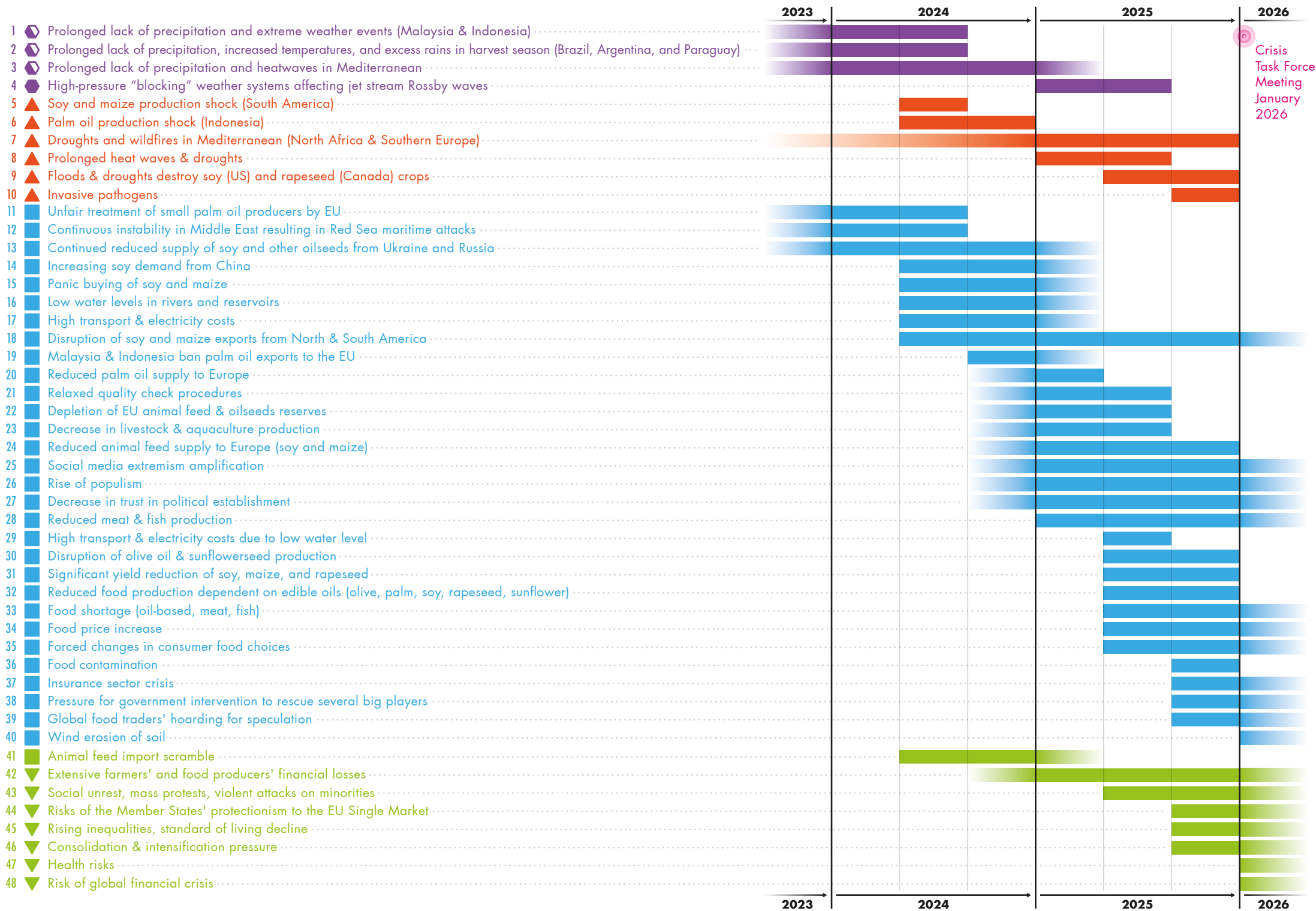
- forced changes in consumer food choices,
- health risks.

Figure 13 • Wider Political, Socio-Economic, and Health Repercussions of Food Crisis



Based on the crisis scenario diagram, it is evident that events unfold chronologically; however, to enhance clarity, the design team decided to complement the diagram with timeframes. Timeframes in the diagram show that events propagate through time and across space causing widespread impacts on the European Union's food security. As previously noted, the scenario initiates with climate triggers, yet the negative impacts are amplified by political tensions, supply chain dynamics, and societal behaviors. Even though most of the climate triggers originate beyond the borders of the European Union, the highly interconnected and interdependent food network causes a ripple effect throughout the entire supply chain system.

Next page: [Figure 14](#) • *Food Alert Crisis Scenario timeline.*



Crisis Task Force Meeting January 2026

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