Policy brief 1/2021

Food system resilience – a new research area for the AU-EU Partnership

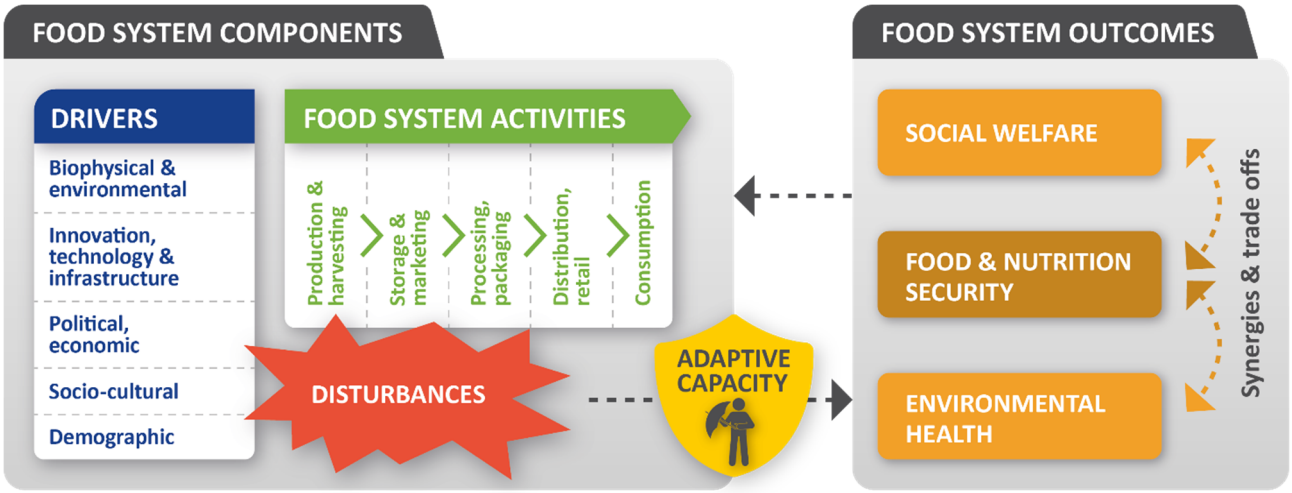
The Intergovernmental Panel on Climate Change (IPCC) report 2021 clearly shows that extreme weather events such as floods, droughts, fires and plagues will occur with increasing frequency and severity. The growing number of people living in poverty and being threatened by food insecurity is further fueled by political unrest. It was, however, the Covid-19 pandemic that has painfully revealed the vulnerability of food systems to global shocks and corresponding political counter measures.

Shocks and stresses can vary in their character, scale, and duration. Solutions need to be found and adapted accordingly. But how can food systems become more resilient to disturbances? How can people prepare themselves and cope with shocks and stresses?

LEAP4FNSSA (Long-term Europe-Africa Partnership for Food and Nutrition Security and Sustainable Agriculture), a project supporting the European Union and African Union in their joint undertaking to implement a Research and Innovation (R&I) Partnership on food and nutrition security and sustainable agriculture (FNSSA), commissioned a study on food system resilience with the objective to provide recommendations for future R&I priorities.

In collaboration with SCAR- ARCH, a panel of experts was engaged to discuss the scope and key issues of food system resilience. ARCH is the working group of the Standing Committee on Agricultural Research (SCAR) dedicated to the solution of global challenges.

The main outcomes of the study build the basis for this policy brief. We suggest to incorporate food system resilience into the R&I agendas of Africa, Europe, and the bi-continental FNSSA Partnership. The importance of this topic is also recognized by the Food System Summit of the United Nations in September 2021, which calls for more resilient, sustainable and inclusive food systems.



Food resilience, adapted from HLPE (2020), FAO (2020)

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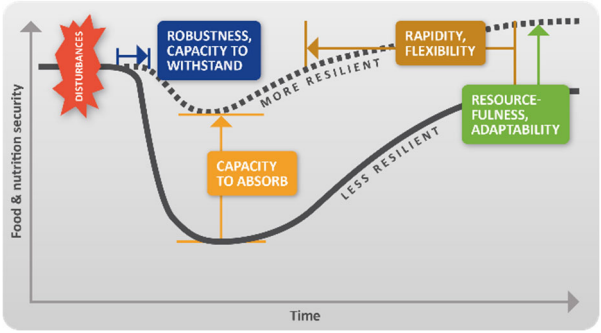
Definition of food systems and resilience

Food systems are defined as socio-ecological systems, characterized by complex interactions, feedback loops and non-linear cause-effect relationships of its components. As such, food systems consist of:

- interactions between and within biogeophysical and human environments, which determine a set of activities;
- the activities themselves (from production to consumption);
- and the outcomes of the activities (contributions to food and nutrition security, environmental health, and social welfare).

Food system resilience refers to **the capacity of a food system over time to provide sufficient, nutritious and accessible food to all its actors despite various, unforeseen disturbances.** Disturbances can occur in the form of stresses, e.g. climate change effects, or shocks, e.g. earthquakes or floods. Food and nutrition security as an outcome of food systems cannot be compromised and therefore serves as a benchmark for how resilient a food system is. This concept of food and nutrition security involves also the dimension of stability, being food secure over time.



Food system resilience is the capacity to provide food security over time and despite disturbances (adapted from Tendall et al. 2015)

While using the outcome food and nutrition security as a normative measure of food system resilience, we recognize that **synergies and trade-offs** exist and require particular attention. These occur between other food system outcomes (social and environmental), other food system properties (e.g. sustainable, inclusive, competitive) and between resilience on different levels and scales (e.g. local/global, short-term/long-term).

Resilience building can be addressed at different levels and scales of food systems. If a system is not able to deal with shocks or stresses, a transformation of the system into a more resilient state can be required (transformative resilience). **The agency of food system actors is defined as the ability to adapt or transform a system as a response to shocks and stresses. Agency thus lies in the centre of resilience building and system transformation.**

1. **Maintain diversity and redundancy**
2. **Manage connectivity**
3. **Manage slow changes and feedback**
4. **Foster complexity and systems thinking**
5. **Encourage learning**
6. **Broaden participation**
7. **Promote polycentric governance**

Seven principles for building resilience by Stockholm Resilience Center (Biggs et al., 2015)

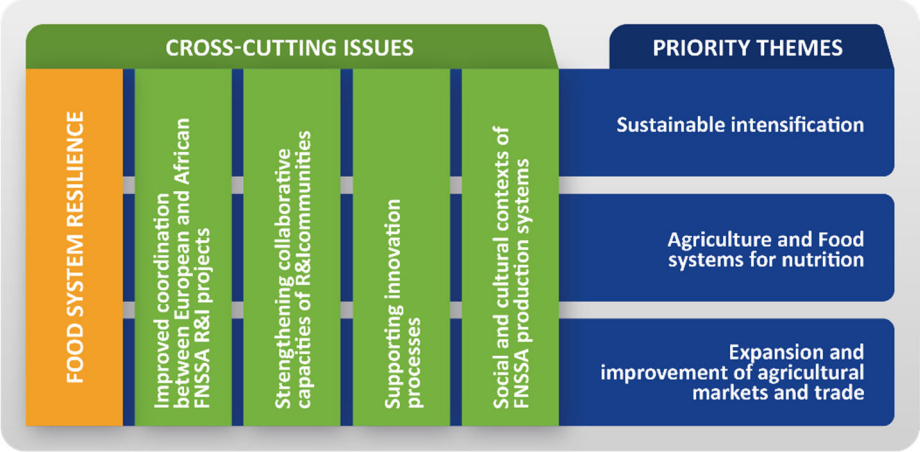
Due to the complexity of food systems and the multiple types of shocks and stresses, **building food system resilience is context-specific. It requires answering the questions: "resilience of what?", "against what?", and "for whom?"**. Such measures can be guided by general principles of resilience building. The seven principles for building resilience in social-ecological systems, developed by the Stockholm Resilience Centre, serve as a framework for applying resilience thinking to food systems.

Resilient food systems as part of the Roadmap

As part of the R&I Partnership in FNSSA and through the High-Level Policy Dialogue (HPLD) on Science, Technology and Innovation (STI), the African Union and the European Union have adopted a 10-year Roadmap for R&I in the field of FNSSA.

The Roadmap is intended to increase the contribution of science to the transformation of food systems to become more sustainable, deliver better nutrition, and mitigate climate change. The overall aim is to increase coherence between and build upon the many projects at national, bilateral or bi-regional (Africa and Europe) levels. The Roadmap also provides an opportunity to align the work of different networks linked to agricultural research.

We propose to establish food system resilience as an additional cross-cutting issue of the Roadmap. This would highlight its importance in the FNSSA Partnership and define the joint research agenda accordingly.



The Roadmap identifies three priority themes and a set of cross-cutting issues which defines a joint research area.

The 7 principles for building resilience can guide R&I initiatives and policy making. Research efforts are required with regard to the applicability in a specific context as well as the interrelatedness of the principles. Knowledge gaps to be addressed by R&I include the following aspects:

Diversity and Redundancy are recognized strategies for increasing resilience. There are however unknowns in regard to the most effective level (local to global), scale (production to consumption) and type of diversity (functioning despite of or in response to shocks).

Connectivity can enhance resilience. However, with respect to market and trade, it is unknown to what extent interdependencies are favourable for resilience building and how dependencies affect a system's vulnerability.

Human agency and the adaptive capacity of people to mobilize their resources and deal with shocks across the food system is another research need. A better knowledge base and effective strategies to increase the resilience capacities of vulnerable people must be developed, e.g. by financing and de-risking women farmers as well as reducing power imbalances in value chains.

AU-EU connectivity and resilient food systems

Africa and Europe are highly interconnected. The Partnership can be used to scale up regional integration for more resilience through cooperation, coordination and knowledge exchange. Long term alliances and collaboration in R&I are important pillars of this cooperation and key to priority schemes of international relevance among research funders. We have identified research needs on the interconnectivity of African and European food systems, joint response mechanisms and its effects on food system resilience.

International trade can reduce volatility by enabling countries to make use of world markets in the face of domestic shocks. On the other hand, dependency on these markets during international crises might put these countries at risk. The EU was again the largest trade partner for Africa in 2020, and the trade interdependency related to food security needs to be revisited from a resilience perspective. Territorial approaches as proposed by the Task Force Rural Africa (2019) might have a strong potential to mitigate risk and build resilience. Further investigations into territorial approaches, their performance, drivers and associated challenges are needed.

Policies are important levers to transform food systems. Yet, a deeper understanding of the impact that political measures can have on resilience is needed. Measures such as fiscal policies, incentives and financing, regulatory policies, market and trade instruments, as well as standard settings need to be analyzed to see whether the lever works effectively and as expected. In detail, it needs to be assessed how these levers relate or interact with other policy instruments, and how they can contribute to build buffers in the system. The intersection and collaboration between public and private actors has a large potential as the private sector often has the capacity to react to shocks quickly. Social protection schemes need to

be strengthened as they have proven to be important and effective tools to help vulnerable people to buffer shocks.

Food system governance reflects power relations between different actors in food systems. Shocks and stresses can reinforce inequalities between social groups. Building resilience requires addressing imbalances between formal and informal, public and private sector, and the role of NGOs that represent the voices of less powerful social groups. Research is needed to identify forms of governance that lead to effective response mechanisms to shocks and stresses while assuring the inclusion of the most vulnerable.

Conclusions and recommendations

Strengthen systemic research on food system resilience. We recommend the adoption of an adaptive system thinking approach to address the challenges food systems face from shocks and stresses. The application of the *7 principles for building resilience* can help to develop context specific strategies in Europe and in Africa. Furthermore, joint (Europe-Africa) political and economic response mechanisms and their effects on food system resilience should be explored. The AU-EU research Partnership can be the appropriate vehicle to adequately address these issues for developing such joint R&I policies. Funding and long-term support for trans-regional and transdisciplinary research efforts, and the engagement of scientific and policy communities is needed to develop interregional/global research approaches.

Exchange and learning on context-specific resilience building. The FNSSA Partnership could serve as an opportunity for mutual learning and knowledge sharing, where research results can be interlinked and up-scaled. Different regions facing similar shocks or stresses should form communities of exchange on best-practice and leverage points. In that context, the issues do not need to be studied in general terms; food system resilience needs to be specified in terms of food system levels and scales, types of shock or stresses, and most vulnerable groups affected by those.

Food system resilience as a crosscutting research issue of the Roadmap. R&I in the AU-EU Partnership needs to provide evidence on the impact of crises on food systems and to identify new pathways to resilience. Food system resilience is not yet in the focus of the FNSSA Partnership's R&I Roadmap. We propose to establish this research domain as an additional cross-cutting issue to the three overarching R&I themes. The indicated research needs can help to identify where to best apply a resilience perspective in collaborative research.

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LEAP4FNSSA is a Coordination and Support Action whose main objective is to provide a tool for European and African institutions to engage in a Sustainable Partnership Platform for research and innovation on Food and Nutrition Security, and Sustainable Agriculture (FNSSA): https://www.leap4fnssa.eu/

Full study report commissioned by LEAP4FNSSA: https://www.leap4fnssa.eu/agora_food-system-resilience-study-report/