



Resilience of Local Food Systems to Crisis - Smart Solutions

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Introduction

The local food system (LFS) is affected by various economic, social, environmental and institutional governance challenges. The ability to manage and cope with these challenges suggests that the LFS is resilient to various shocks from the external environment. The term "resilience" is based on the need and capacity of socio-economic systems to cope with change or crises. The concept of resilience is widely used for the sustainability of individual economic sectors and for the management of various crises and extreme events. According to the UN Food and Agriculture Organization (2018), **resilience** is the capacity of individuals, households, communities, cities, institutions, systems and societies to prevent, resist, adapt, respond and recover effectively and efficiently in the face of a wide range of risks, while maintaining tolerable levels of agency and functioning, without compromising the longer-term perspectives of sustainable development, peace and security, human rights and prosperity. According to NATO standards (2020), resilience is defined as the ability of a society to withstand and recover easily and quickly from such shocks; it combines civic preparedness and military capabilities. Strategic areas for building resilience include food and water security and energy supply as a component of the food supply chain.

Meuwissen et al. (2019) define farming system **resilience** as the ability to ensure the fulfilment of the system's functions, taking into account the complexity of economic, social, environmental and institutional shocks, in a system that is ready to withstand shocks, and that is capable of adapting/transforming.

With the EU's Green Deal policy, which aims to ensure the resilience of the EU's rural areas and the local food system, innovation and smart solutions are becoming an important tool that can turn climate and environmental challenges into additional opportunities for rural areas.

The EU's Farm to Table Strategy aims to replace the current EU food system with a sustainable model, contributing to the 2050 climate neutrality target and the transition to a sustainable food system. LEADER programm and Smart Villages projects are tools that can be flexibly targeted to test innovations and smart solutions to prepare for living in crisis and extreme conditions and to strengthen the resilience of local food systems. It is therefore essential that rural communities, Local Action Groups (LAGs), in cooperation with municipal administrations and local farmers, take advantage of the new opportunities offered by various innovations and other smart agricultural and rural development solutions to increase the resilience of LFS.

The study focuses on the local food system and the innovations and smart solutions that build resilience.

The objective of the study is to identify innovations and smart solutions that enhance the resilience of the local food system.

Methodology

The research was carried out using methods of analysis and synthesis of scientific literature, comparison, structuring, graphical representation, theoretical modelling and other research methods. The study and its data cover the period 2014-2023.

Results

1. Description of the local food system and its importance for the local community. The LFS comprises a locally organised network of activities in which the whole system operates at the scale of a given administrative unit, covering agriculture, food production, processing, marketing, creating and maintaining access to consumption, consumption itself and the rational use of by-products and waste. The LFS model supported by the local community (see figure) could include households and family farms that grow, process and sell food products; farms that have already developed various agro-technologies for growing, processing, transporting, storing and marketing products, etc.

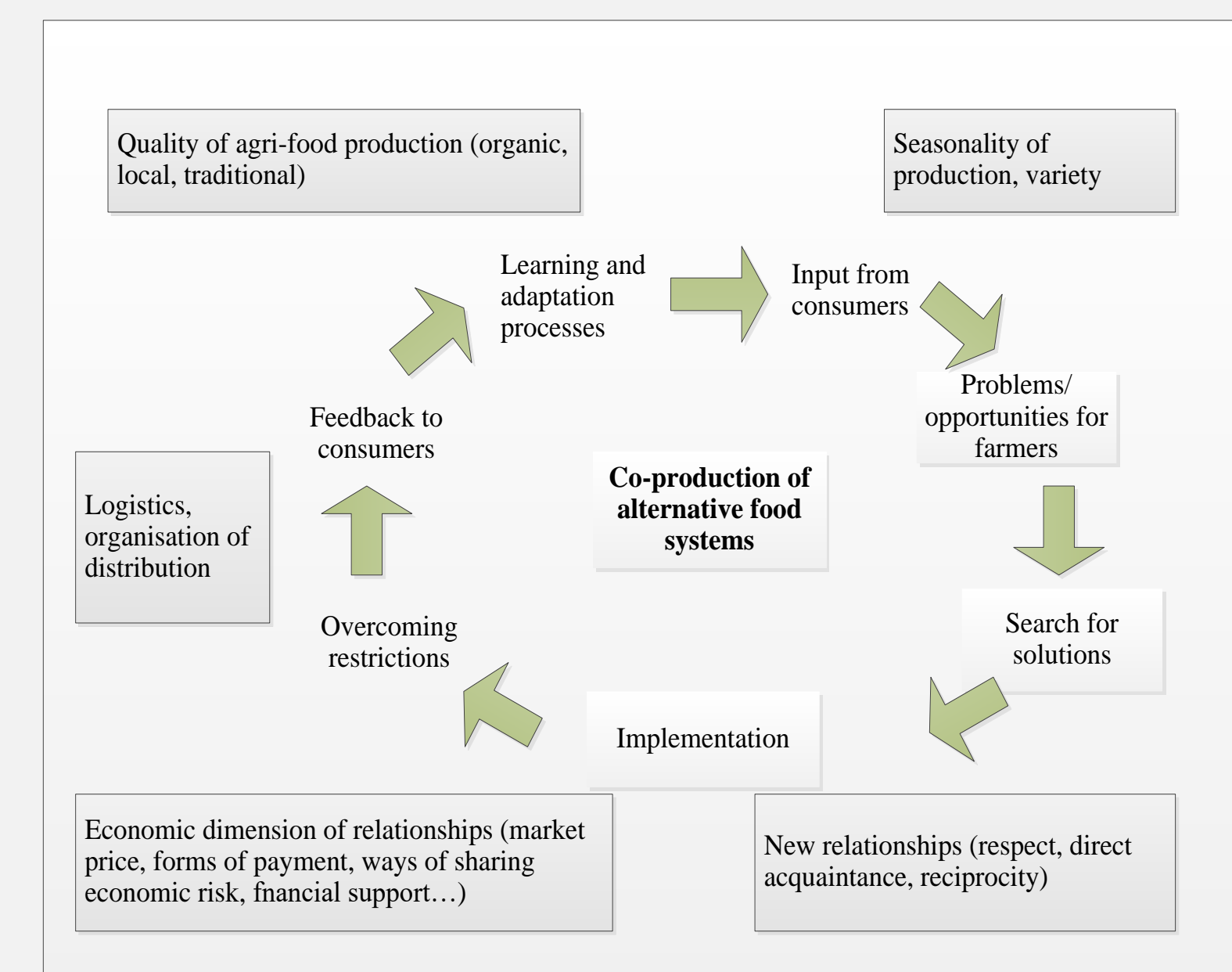


Fig. A model for building a community-supported local food system

The development of the LFS is important for the local community:

- a properly organised LFS provides consumers with more equal access to quality food;
- fosters solidarity between the local community, consumers and farmers;
- strengthens cooperation between the different actors involved in the development of the LFS;
- increases the involvement of local people and the community in the production, promotion and sharing of local food;
- shows local authorities how different population groups live;
- strengthens the decision-making power of local actors by providing suggestions to public authorities and rural development policy makers;
- promotes volunteering, trust and accountability.

2. Innovations and smart solutions to build resilience in local food systems

The table below shows the resilience-enhancing innovations and other smart solutions in the LFS, based on the summarised results of the expert assessment.

Factor	Examples of recommended innovations and smart solutions
1. Severe and catastrophic weather events (drought, heavy rainfall, hail, storms, floods, frost)	<ul style="list-style-type: none"> • Innovations and innovative products in the agricultural insurance market; • Development and application of models for diversification of agricultural activities; • Cultivation technologies, engineering-technological solutions, breeding of climate-resilient plants and animals, etc.
2. Epidemic outbreaks of animal and plant diseases	<ul style="list-style-type: none"> • Innovations for localisation and rapid response to animal and plant disease outbreaks; • Strengthening biosecurity; • Innovations in disease monitoring, prevention and spread solutions, biotechnology, etc.

Results

Factor	Examples of recommended innovations and smart solutions
3. Lack of cooperation between farmers in their farming activities	<ul style="list-style-type: none"> • Promoting farmer cooperatives; • Strengthening rural communities and additional funding for community projects; • IT solutions geared to the needs of farms, innovations that optimise farm input costs; • Establishment of a farmer cooperation platform and promotion of synergies between farmers.
4. Lack of integration of local food raw material producers in the value chain and orientation towards higher value-added products	<ul style="list-style-type: none"> • Measures to promote cooperation in the processing of agricultural products; • Introducing models for sharing agricultural production and processing resources; • Support for business start-ups in rural areas and communities focused on the production of high added value products; • Training for farmers and communities to reorient their activities towards the production of higher value products; • Social innovation, IT solutions focused on the needs of farms and local communities.
5. Low diversification of agricultural and food products	<ul style="list-style-type: none"> • Bringing agricultural producers and processors closer together; • Innovations in farm cooperation by bringing together small farms; • Innovations in food consumption that change consumer habits.
6. Insufficient focus on attracting young people to rural areas	<ul style="list-style-type: none"> • Expanding study opportunities for young people from rural backgrounds; • Specific measures aimed at attracting young people to rural areas; • Developing positive attitudes towards agriculture and the countryside.
7. Degradation of soil quality (soil erosion, nutrient leaching, pesticide contamination, etc.)	<ul style="list-style-type: none"> • Measures to stabilise the decline in the livestock sector; • Fewer excessive restrictions on the storage and use of manure; • Use of sustainable farming methods, e.g. no-till farming; • Smart agro-technical solutions for soil tillage; Biological solutions (use of biological products, etc.).
8. Underdeveloped logistics system for the supply of local foodstuffs, lack of specialised storage and preparation facilities for local produce	<ul style="list-style-type: none"> • Promoting e-commerce in local products and other IT solutions; • Support for the installation of equipment for storing and preparing local produce for sale; • Diversification of local production in line with seasonal needs; Innovations in food transport, processing and nutrient preservation; • Setting up and renting of municipal/regional food logistics centres to farmers.

The table below shows various examples of innovations and other smart solutions for agriculture and rural development, which show that there are real opportunities to reduce the impact of potential crises and extreme events on the LFS or to increase its resilience. However, this requires the right solutions, ranging from farm and community level to policy decisions at national level.

Main conclusions

1. The local food system is a new socio-economic phenomenon in Lithuania, which can help to address the social, economic and environmental problems of rural areas, to ensure sustainable development of rural areas, and to increase the resilience of rural communities to various crises.
2. The importance of LFS has increased in recent years, as various crises or emergencies have increased the risk of inadequate and erratic supply of essential food products to the country's consumers due to the disruption of the global food supply chain.
3. A holistic approach to addressing the issue of resilience of the LFS allows for synergies to be achieved in order to achieve smart solutions that involve all the stakeholders involved in building the resilience of the LFS, who are confronted with the negative external and internal pressures on the LFS.
4. The overall results of the study show that a range of innovations and other smart solutions for agriculture and rural development are possible to reduce the impact of crises and extreme events on the LFS or to increase its resilience.