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Assessment of the Resilience of the Organic Food System

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Abstract. The organic food system is a component of sustainable food systems, which contributes to achieving the goals of the Farm to Fork strategy. The current statistical data reveal the first indications of failing to achieve strategic goal 9 of the CAP Strategic Plan for 2023–2027 and the goal of the Farm to Fork strategy in Latvia. This creates a need for a comprehensive assessment of the organic food system. The present research aims to identify the need to increase the resilience of the organic food system in Latvia. One of the decision analysis methods - SWOT analysis - was employed to comprehensively assess the organic food system. It was concluded that in order to increase the resilience of the organic food system in Latvia, it is primarily necessary to stimulate the demand for organic food by the public catering industry through GPP (green public procurement) procedures. An equally important need is to stimulate the supply of organic food (to contribute to both the transition to organic farming and the resilience of current economic operators in the organic farming scheme, as well as to foster organic processing). To mitigate the threats, policy makers need to review support rates applicable to organic farming, as well as promote knowledge transfer between all food supply chain actors.

Key words: SWOT, organic food system, sustainability, organic farming, sustainable food system.

INTRODUCTION

Global environmental challenges, such as biodiversity decline, habitat degradation, fertilizer and pesticide overuse, and water pollution, are aggravated by the impact of food systems (Ušča et al., 2023). Moreover, agroecology is now emerging as the fundamental science to guide the conversion of conventional production systems to more diversified and self-sufficient organic systems (Escobar et al., 2019).

The goal of the European Green Deal in relation to sustainable consumption and production (UN Goal 12) is that food systems become a global standard for competitive sustainability, protection of human and planetary health as well as the livelihoods of all actors in the food supply chain not only in Europe but also throughout the world (European Green Deal, 2019; Zihare et al., 2019; Glavič, 2021).

The Farm to Fork strategy intends to facilitate the transition to a sustainable EU food system, thereby reducing the environmental and climatic footprint of the EU food system, increasing its resilience, protecting the health of the population and providing livelihoods for economic operators. This strategy also specifies specific targets for the transformation of the EU food system: it is intended to reduce the use of pesticides and the related risks by 50%, reduce the use of fertilizers by at least 20%, reduce the sale of antimicrobials used in farm animals and aquaculture by 50% and ensure that organic farming occupies 25% of the total agricultural area (EC, A Farm to fork, 2020).

To increase the role of European agriculture in the future, the EU Common Agricultural Policy (hereafter CAP) is reviewed and adapted to the changing economic conditions and the demands and needs of the population. In June 2018, the European Commission presented legislative proposals for a new CAP after 2020, including sustainability targets of the European Green Deal. Latvia's Strategic Goal 9, as outlined in the CAP Strategic Plan for 2023–2027, focuses on empowering EU agriculture to respond to public health and food safety concerns. By prioritizing safe, nutritious, and sustainably produced food, reducing food waste, and enhancing animal welfare, the goal underscores the importance of biological systems in achieving a sustainable food supply. (CAP Strategic Plan, 2022). The organic food system is a component of the sustainable food system. The organic food system combines all elements and activities related to the production, processing, distribution, preparation, and consumption of food of organic origin and the results of the activities, including socio-economic and environmental effects (Stefanovic, 2022).

In accordance with Regulation (EU) 2018/848 of the European Parliament and of the Council, organic production is defined as 'a comprehensive system of farm management and food production that combines the best environmental and climate policy practices, high biodiversity, conservation of natural resources and high animal welfare and production standards that meet the demand for food by an ever-increasing number of consumers, which is produced using natural substances and processes' (Regulation (EU) 2018/848, 2018).

The green public procurement (GPP) is one of the ways of distributing organic products. Environmentally friendly procurement was officially defined as GPP at the Rio+10 Conference in Johannesburg in 2002. GPP can help to stimulate minimum demand for sustainable foods in the final and intermediate markets that would otherwise be difficult to achieve (Testa et al., 2016).

In terms of organically certified area, expressed as a percentage of the total UAA, Latvia ranks 8th in the European Union (European Environment Agency, 2023). The area of biologically certified aquaculture ponds in Latvia is about 200 hectares or approximately 4% of the total area of aquaculture ponds. Organic farming is characterized by multi-sectoral production, and the organic farmers mainly produce cereals and dairy products. Overall, according to the Institute of Agricultural Resources and Economics, the proportion of organic food in the total output of agricultural products was 6.2% in 2020. In Latvia, the quantity of processed organic agricultural food tends to gradually increase, and this trend is encouraged so that the food produced by organic techniques reaches final consumers (Lismanis et al., 2022).

During the last 12 years, the organic area has increased significantly or almost twofold, exceeding 300 thousand hectares in 2022, i.e. more than 16% of the total UAA. In addition, current farms tend to expand in size. At the same time, it should be added

that the area declared for farm support in 2023 was 1.9% or almost six thousand ha less than in 2022 (Ministry of Agriculture, Action plan 2023).

At the beginning of 2023, the organic certified area totalled 314637 ha, while wild areas (forests, swamps etc.) occupied 733,271 ha. As a land resource, the certified wild area plays a major role in the production and supply of organic food and fodder; therefore, this part of organic farming practices could be basically considered to be agroforestry. It is an important area that is farmed in compliance with the conditions of organic production and without the use of synthetic mineral fertilizers and pesticides, and in which, in order to produce organic food, farming activities take place in forest pastures, forest apiaries, including swamps and scrubs, fallow land and forestry, thereby contributing to the preservation of not only pollinators, including honeybees, but also providing ecosystem services and making other significant contributions to the environment.

The number of primary organic producers has been relatively steady in recent years: in 2021 there were 4121 organic operators, while on 1 January 2023, their number already reached 4,453 (Ministry of Agriculture, Action plan 2023). In December 2023, according to the Food and Veterinary Service (FVS), their number decreased by 14% to 3,818 operators (the reason for the decrease was mainly the change of generations, the cessation of economic activity, a decrease in the market price of organic food, as well as the reluctance to undertake new five-year obligations) (Ministry of Agriculture, Action plan 2023). According to the latest statistical data from Agricultural data centre in Latvia, there are the first indications of failing to achieve strategic goal nine of the CAP Strategic Plan for 2023–2027 and the goal of the Farm to Fork strategy in Latvia. This research aims to identify the needs of the Latvian organic food system, in terms of increasing its resilience. The intended outcome of this research is to enhance overall the Latvian organic food system within the context of international sustainability goals.

MATERIALS AND METHODS

Since the organic food system relates to food produced by organic farming techniques, the present paper is based on research studies provided by several authors (Aleksejeva et al., 2021), defines organic food by its safety and health benefits. In conformity with other related author research (Mie et al., 2017; Stefanovic, 2022; Mohd et al., 2023).

Researchers from the Sustainable Consumption and Production Unit, Department of Agriculture and Food, Research Institutes of Sweden, proposed a methodology for both identifying interactions and calculating the weights of indicators for food system sustainability to assess scenarios (Rad & Sonesson, 2024), and the present research includes a similar research methodology.

Findings reveal that organic food consistently outperforms conventional food in terms of carbon footprint, both per land unit and per product unit, strongly supporting organic farming as a sustainable future pathway (Chiriaco et al., 2022).

An analytical method employing a review of scientific literature and statistical data from 2015 to 2021 (data from Agricultural data centre) was used to assess the resilience of the organic food system. The resilience assessment of the organic food system was performed based on a methodology shown below, see Fig. 1.

The SWOT elements were based on an overall assessment of organic food system. The SWOT analysis methodology was developed based on research studies by Malik et al., 2013 and Wardhani & Dini, 2020. The methodology allowed:

- ✓ identification of the significance of each SWOT element;
- ✓ identification of strategies for meeting needs;
- ✓ identification of the significance of the needs.

The SWOT analysis allowed us to assign significance to the SWOT elements affecting the internal and external environments within their group in the range of 0 to 3 (0 – no impact, 3 – significant impact).

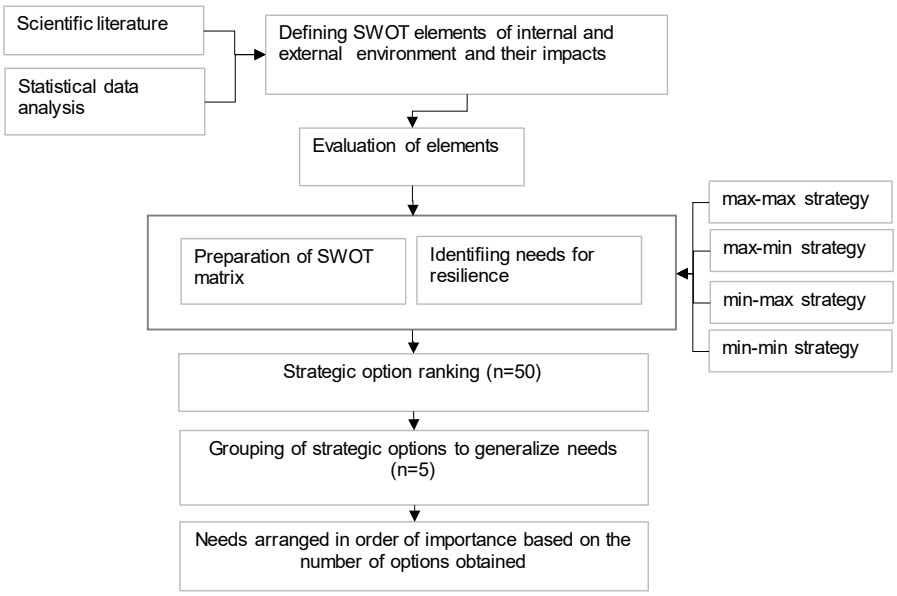

Figure 1. Methodology for the assessment of the organic food system.

To define the needs after the SWOT elements had been assessed, the authors designed a detailed SWOT matrix with the following strategy options:

- ✓ max-max strategy options. The options are derived from respective combinations of strengths (S) of the internal environment and opportunities (O) of the external environment. The strategy uses the strengths of the internal environment (S) to exploit the opportunities of the external environment (O);
- ✓ max-min strategy options. The options are derived from respective combinations of strengths (S) of the internal environment and external environmental threats (T) – the internal environmental strengths (S) are used to mitigate the external environmental threats (T);
- ✓ min-max strategy options. The options are derived from respective combinations of internal environmental weaknesses (W) and external environmental opportunities (O) – the internal environmental weaknesses (W) are eliminated to use the external environmental opportunities (O);

✓ min-min strategy options. The options are derived from respective combinations of internal environmental weaknesses (W) and external environmental threats (T) – the internal environmental weaknesses (W) are eliminated to mitigate the external environmental threats (T).

At the next stage, the authors made a list of all the strategy options, arranging them in two columns. The first column contained the elements of the external environment, while the second column included the elements of the internal environment. The ranks of both elements of a strategic option were added up to identify a rank for the respective option. The authors grouped the strategic options, combining them into more broadly formulated strategic pathways of development or needs. The ranks of the strategic options within each need were added up to identify a rank of the respective need. The authors placed the needs in descending order according to their ranks.

RESULTS AND DISCUSSION

Organic farming focuses only on the agricultural activity, whereas the organic food system combines all the elements and activities related to the production, processing, distribution, cooking, and consumption of organic foods; as a result, it shapes consumer demand for local, organic, healthy and safe food as well as its effects on the social, economic and natural environments.

Local food involves traditional diets, as well as reduces the amount of food transportation-related GHG emissions. Short food supply chains deal with locally sourced foods, the producer is close to the consumer and fewer companies are involved in supplying the food to the consumer (Naglis-Liepa et al., 2021). To foster the transition to sustainable food systems and adequate food, Italian researchers, in cooperation with the Italian Department of Environmental, Biological and Pharmaceutical Sciences and Technologies recommend identifying emissions from organic and conventional food (Chiriaco et al., 2022).

Food consumption habits tend to change, new opportunities are provided by various marketing activities, and the income level and buying power of the population tend to increase, while food waste largely relates to social and ethical issues. Researchers from Tallinn University of Technology in Estonia propose introducing ethics audits, which allow farmers to better plan their marketing communications. The ethics audit model could be used as a systematic survey instrument and theory-based process for correlating real organic production and consumers' expectations to increase consumers' trust in and awareness of organic food advantages (Ojasoo & Leppiman, 2019). Concerning how consumers relate their knowledge of organic food to the personal benefits resulting from the consumption of organic food, the latest scientific literature proposes applying means-end chain (MEC) theory to map mental decision-making processes) (Winterstein et al., 2024).

On a local scale from an economic perspective, organic farms contribute to employment and, accordingly, an increase in personal income tax (PIT) revenues paid to the local government, financial security, the development of family farms, improvements in rural areas and the availability of local organic food at affordable prices (Brown & Miller, 2008). Involvement in organic food supply chains allows the businesses to increase the value added of their products and makes the farmers less sensitive to market risks, reduces the number of intermediaries through diversification

and better price control, guaranteeing less asymmetric relationships with customers (Hardesty & Leff, 2010; Richard et al., 2014; Knickel & Renting, 2000).

SWOT analysis

Based on Table 1, four strength elements were identified in the SWOT matrix. All the strengths had an impact on the contribution of the organic food system to the development of the local area The research evidence suggests that elements S1 and S4 were highly significant. S1 indicated the financial well-being of organic food producers.

Table 1. Elements of the internal environment and their impacts on the resilience of the organic food system in Latvia

Strengths		Impact	Weaknesses		Impact
S1	Ensuring the financial well-being of farmers - producers of organic food	3	W1	Lack of organic resources hinders the development of organic farming	3
S2	Promoting the development of the local area, preservation of the natural environment	2	W2	There are transitional technical, economic and structural barriers	1
S3	Contributing to the achievement of environmental climate goals in terms of GHG emissions, air and water quality preservation, biodiversity	1	W3	Complex legal acts, a lack of knowledge about the integrity of prerequisites for OF in the process of economic activity	1
S4	Promote the well-being of society - high-quality GMO-free food without antibiotics and mineral fertilizers, pesticide residues in the local market	3	W4	Consumers lack trust and knowledge about organic products and eco-labels	3
			W5	Farmers lack knowledge and cooperation networks for knowledge sharing	2

Element S4, however, indicates the well-being of society. As the output of organic food expands, quality food produced without GMOs, antibiotics, and pesticide residues becomes more accessible to consumers. At the same time, new and current cooperation networks emerge at the local level, e.g. direct buying groups etc. Local governments also stimulate the consumption of organic food through public procurement, encouraging healthy eating habits and, in the long term, reducing health care costs associated with obesity and chronic diseases. The authors rated S2 as having a lower impact. It indicates the development of the local area and the preservation of the natural landscape. These are intermediate processes that occur in rural areas if practising organic farming techniques. The authors gave the lowest rating with a small impact to S3, which also represented an intermediate condition and stemmed from organic farming - contributing to the achievement of environmental climate goals regarding GHG, air and water quality preservation, as well as biodiversity.

Five weaknesses with different impacts of significance were identified in the SWOT matrix. The research evidence suggests, the most significant shortcomings in the organic food system related to the availability of resources at the primary production stage and a lack of consumer knowledge about food produced organically, hence a low level of trust in the eco-label. There is a shortage of organic seeds and vegetative

propagation material in the local market, especially for grass seeds. Shortages of certain feed materials (e.g. peas, beans, rapeseed, soybean) result in difficulty for livestock farmers to develop balanced livestock diets in such a way that they are economically viable. Restocking the herds with quality breeding material is also a significant problem. The increased requirements for the purchase of non-organic livestock make it difficult to restock and enhance the herds because often it takes a long time to obtain a special permit from a control institution, and by the time this permit is granted, the selected livestock have already been sold to other persons. Often, livestock production practices (breeds, livestock keeping conditions) also cause problems to farmers because there are strict requirements for organic farming regarding various kinds of manipulation to improve the health, well-being and hygiene of livestock, especially in relation to cattle dehorning and sheep tail docking. To solve such problems, the farmers need to comply with the basic organic farming principles requiring keeping appropriate breeds of livestock, which is not always done. The choice of a breed could be determined by several factors: the availability on the market, livestock productivity or carcass yield, market demand, as well as the farmer's own wishes. The research evidence suggests, the extent of the problems identified regarding the use of non-organic resources in organic farming also affects consumer trust in organic food, as the consumers often do not comprehend the flow of organic resources within the organic food system.

Based on the above-mentioned considerations, the authors rated W5 as having a lower impact. It refers to a lack of cooperation networks for farmers within the organic food system. For information sharing, farmers most often use various national institutions (FVS, Ministry of Agriculture, State Plant Protection Service, Rural Support Service), as well as private organizations, e.g. certification institutions and the Latvian Rural Advisory and Training Centre, less often non-governmental organizations, e.g. the Latvian Organic Farmers Association. Cooperation and the development of other cooperation networks is weak; therefore, farmers lack knowledge and experience, especially in controlling plant diseases and pests or in drawing up a correct plan for crop rotation and change. The authors rated S2 and S3 as having a lower impact, which related to current barriers to the transition to organic farming. The barriers during the transition period could relate to inadequate technical support, inadequate livestock housing, crop varieties and livestock breeds. In addition, any changes require financial resources and knowledge in the selection and application of proper technologies in both crop processing and livestock production. Besides, the complicated legislation and the current certification cost hinder the transition to organic farming, especially for small farms, because the certification cost and the cost of keeping records during the certification are inadequately high.

The elements of the external environment of the organic food system are presented in Table 2. The research suggests distinguishing six categories of policy instruments or opportunities with varying degrees of impact to enhance the sustainability of the local organic food system. O1, O3 and O4 were rated as having the significance level of 3. First, sufficient financial support and tax relief (e.g. VAT) are needed to offset high production costs and lost profits. Second, there is a need for measures conducive to knowledge sharing for the actors involved in the entire food system value chain and the development and integration of requirements conducive to the sale of organic food into food policies. The authors rated O2, O5 and O6 as having a slightly lower impact. They involve investment support for reducing technical and structural barriers, as well as

increasing productivity and competitiveness throughout the food system value chain. O5 pertains to the development and enhancement of technological and environmental solutions, including the expansion of outlets, the integration of IT technologies into agricultural production, as well as the creation of various waste management options. However, O6 relates to the development of various forms of cooperation for sharing knowledge and information to increase the value added of organic food and reduce production costs.

Table 2. Elements of the external environment and their impacts on the resilience of the organic food system in Latvia

Opportunities		Impact	Threats		Impact
O1	Sufficient financial support and tax relief	3	T1	Unfavourable demographic trends, urbanization (population concentration in cities) and socio-political changes	2
O2	Investment support	2	T2	Development of unsustainable food consumption habits	3
O3	Knowledge build-up activities for both consumers and producers	3	T3	Low buying power of consumers, globalization (large retail chains outcompete small producers), limited opportunities to influence the market price	3
O4	Development and integration of requirements conducive to the sale of organic food into sustainable food policies	3	T4	Unfavourable support (subsidy) policies and tax policies decrease the sales of organic products in the local market and the overall development of organic farming	3
O5	Development and enhancement of technological and environmental solutions	2	T5	Fast changes in land cover uses	1
I6	Development of forms of cooperation - collaboration, networking	2	D6	Climate change (decrease in biodiversity, drastic weather changes)	2
			D7	Spread of invasive plant species and pests, as well as the spread of animal diseases	2

The SWOT matrix has 7 threats to the sustainability of the organic food system, or 7 T elements. T2, T3 and T4 were rated as having a significant impact. T2 indicates the development of unsustainable dietary habits, which might result in a decrease in the consumption of quality and nutrient-rich food, including the demand for organically produced foods. T3 pertains to economic growth, consumer buying power and globalization; consequently, the competitiveness and market power of small producers decrease in terms of selling price. T4 represents an unfavorable support (subsidy) and tax policy. The CAP SP for 2023–2027 emphasizes the positive impacts of organic farming on achieving sustainability goals, while the support policy is a serious threat to the sustainability of organic farming and the will of farmers engaged in intensive farming to shift to the organic farming model.

The authors rated T1, T6 and T7 elements of the external environment as being of lower significance. T1 refers to unfavourable demographic trends, i.e. an increase in the proportion of elderly people and a decrease in the proportion of young people in the total population. Such an age structure of the population affects the labour market and employment, as well as tax revenues paid to the state budget. T1 also relates to the outflow of people from rural areas to cities. Consequently, the food system and dietary habits, as well as natural environmental landscapes change, as rural farmsteads tend to disappear. As the population decreases, the attractiveness of doing business in rural areas decreases, as does the availability of public services (schools, shops, public transport, libraries, cultural events etc.). T6 and T7 represent indirect drivers of the organic food system; therefore, their impacts were assigned a lower weight. Climate change and the spread of invasive plant species and pests impact the quality of organic food, which is often considered a significant barrier to the organic food market, especially for GPP; therefore, it is necessary to promote the sharing of knowledge to reduce the risks. The authors rated T5, which refers to changes in land cover uses, as having an insignificant impact, as it is an indirect driver of the organic food system, which does not directly affect the sustainability of the food system.

Need identification

The authors identified five needs that covered the entire food system supply chain and did not contradict the Action Plan of the European Commission and the Ministry of Agriculture of Latvia on how to develop organic production prescribed by the CAP SP for 2023–2027. According to their ranks, the needs were divided into three groups: urgent, moderate and low (Table 3).

Table 3. Needs identified and assessed for strengthening the resilience of organic food in Latvia

Need		Total score	Rank	Rating
V1	Stimulate the demand for organic food in the public catering sector through GPP procedures	105	1	Urgent
V2	Stimulate the supply of organic food (facilitate both the transition to organic farming and the retention of current operators in the organic farming scheme, as well as promote the development of organic processing)	101	2	Urgent
V3	Increase the contribution of organic farming to sustainability (improving livestock welfare, availability of organic seeds, reducing the industry's carbon footprint and minimizing plastic, water and energy consumption)	23	5	Low
V4	Improve the availability of information and consumers' knowledge about organically produced food	37	3	Moderate
V5	Increase the availability of local organic food at outlets	36	4	Moderate

The analysis has revealed that there is an urgent need to stimulate the demand for organic food in the public catering sector through GPP procedures and stimulate the supply of organic food. A moderate need is to improve the availability of information and consumer knowledge about organic food and increase the availability of local organic food at outlets. In contrast, there is a low need to increase the contribution of organic farming to sustainability.

The research evidence and based on the need rankings, more focus should be placed on solving the needs of the first group, as the ranks of the needs of the 2nd and 3rd groups were significantly lower. This means that the potential contribution of GPP in the organic food system could have some potential only if the demand for and supply of organic food are stimulated.

CONCLUSIONS

Organic farming plays an essential role in the transition to a sustainable food system, which provides not only environmental, social and health contributions but also economic benefits for all residents, including businesses.

In Latvia, the sustainability of the organic food system is threatened by the development of unsustainable dietary habits, low consumer buying power and trust in eco-labels, a shortage of organic production resources, globalization, and unfavourable support (subsidy) policies. This research aims to identify the needs of the Latvian organic food system, in terms of increasing its resilience:

To increase the resilience of the organic food system in Latvia, it is primarily necessary to stimulate the demand for organic food by the public catering sector through GPP (green public procurement) procedures. An equally important need is to stimulate the supply of organic food (to contribute to both the transition to organic farming and the resilience of current economic operators in the organic farming scheme, as well as to foster organic processing). To mitigate the threats, policy makers need to review support rates applicable to organic farming, as well as promote knowledge transfer between all food system actors.

In the future, the resilience of organic food systems in the European Union Member States might face a growing demand for food globally, especially in countries suffering from insufficient food supply, geopolitical conflicts, and the consequences of climate change. The requirements for food quality set by the population are low - the main one is that food must be available. This could reduce the desire of food producers to supply safe and healthy food, while at the same time, it is also a driving force to work on new technologies and opportunities for the development of organic food.

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