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LOCAL FOOD AND SHORT SUPPLY CHAINS IN SZEKLERLAND

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1. Background and objectives of the work

The current challenges facing the food system are closely linked to the effects of globalisation, which has reduced the role of the peasantry and led to the domination of food supply networks by large corporations. With the separation of production and consumption, self-sufficiency has gradually disappeared (Oppenkowski, 2019), while urbanisation has further exacerbated sustainability problems. The strengthening of local food systems and short supply chains (SFSCs) may offer solutions, as they reduce supply chain length, increase transparency and strengthen local economies (Ilbery & Maye, 2005; Tanasa & Doboș, 2016;Ušča & Aļeksējeva, 2023;Strenght2Food Horizon project, 2021).

SFSCs not only provide physical proximity, but also take into account social and environmental sustainability concerns (Renting et al., 2003). They support small and medium producers, preserving traditional production methods (Kneafsey et al., 2013). They reduce emissions from food transport, increase the proportion of seasonal food consumed locally, and improve the market position of producers (Benedek & Balázs, 2014; Feenstra, 1997).

For producers, SFSCs provide higher incomes by reducing the role of middlemen (Pitrová et al., 2020). Farming can be a legacy, a forced career or a way of life, but local production contributes to the well-being of rural households, especially during economic crises (Tudor, 2015; Deroche-Leydier, 2025; Bayir et al., 2022). Producers participating in SFSCs adopt more flexible marketing strategies and have better bargaining power (Vittersø et al., 2019).

For consumers, SFSCs benefit from access to fresh, local and seasonal foods and the preservation of traditional products (Kloppenburg et al., 2000); (Feldmann & Hamm, 2015). Demand for sustainable products is influenced by education, but prices can be challenging, so education and the promotion of conscious consumption are key (Țigan et al., 2021). The COVID-19 pandemic has boosted demand for local food and accelerated the digital transformation, which has contributed to the stability of smallholder farmers (Benedek et al., 2021; Brumă et al., 2021).

Challenges faced by SFSCs include scalability, logistical problems and strict regulations (Hinrichs, 2000; Lioutas & Charatsari, 2020). Producer collaboration and digitalisation are essential for success (Benedek, 2023). Platforms such as the SKIN project facilitate direct producer-consumer linkages, while EU programmes (LEADER, Horizon 2020, CAP) provide financial and technical support for the development of local systems (Jarzębowski & Pietrzyck, 2018).

In Romania, the development of SFSCs is influenced by the legacy of urban food scarcity before the regime change and the large number of small farms. Agriculture is extremely polarised, with farms under 1 hectare accounting for 55.3% of the landholdings, while farms over 100 hectares account for 48.2% of the land (Gheorghe et al., 2022). Fragmented landholding structures and lack of trust are barriers to efficiency and cooperative cooperation (Amat et al., 2019).

The aim of the research is to increase knowledge on local food systems, especially in the context of Szeklerland, and to promote sustainable economic models. The development of SFSCs fits in with the objectives of the EU Green Deal and the Farm to Fork strategy, contributing to a more sustainable food system (Alessandrini, 2024).

This research outlines a situational picture of short distribution channels. I am looking for farmers' markets, community-supported agricultural projects, food hubs[1] , social media sales groups, village guest tables, i.e. all the solutions that can be associated with the Farm to Fork strategy in Szeklerland. My research will examine the viability, effectiveness and sustainability of these forms of community-based economic manifestations in the light of the above data.

The actors of SFSC (SFSC organisers, producers, consumers) were analysed according to different aspects. In the case of SFSC organisers, my aim was to identify the competences required for the work of organisers through in-depth interviews in order to provide a basis for targeted training and effective development.

On the producer side, I focused on reducing food waste and explored good practices and barriers in Szeklerland through in-depth interviews.

Consumers are the third major group of actors in SFSC. However, in the context of Szeklerland, there is still very little information available on consumer attitudes, so I looked for clusters of consumers in terms of local food consumption and perceptions of peasant lifestyle.

In my dissertation, I formulated the following objectives, and specific research questions assigned to these objectives:

1. Objective 1 (grounding): Mapping the local context in Szeklerland
1/1 Research question: what SFSCs are currently operating in Szeklerland?
2. Objective 2: Mapping the key competences needed for SFSC organisation

[1] I consciously use the term food hub in its original, American name. This is how it is known and used in both Romanian and European literature. It means a food hub, but with a much broader content (e.g. training for suppliers).

Research question 2/1: What are the key competences needed for SFSC organisers to be effective and how do they differ across EU countries?

3. Objective 3: To identify strategies used to avoid food waste and to present options to reduce food waste

Research questions:

3/1 What strategies do small-scale producers in Szeklerland use to reduce food loss?

3/2 What are the barriers to the uptake of community-based food processing and marketing solutions in Szeklerland and what strategies can help their successful introduction?

4. Objective 4: To identify consumer attitudes and opportunities in the local products market

Research questions:

4/1 Can consumer attitudes be used to distinguish groups of local products in Szeklerland?

4/2 To what extent do sceptical consumer attitudes influence the acceptance of local product certification in Szeklerland?

The questions were investigated using qualitative methods and small samples, therefore no hypothesis testing was performed. Instead of hypotheses, the above research questions guided my work.

2. Material and method

I used three different methods to investigate the three actors of SFSC (producer, consumer, SFSC organiser).

2.1 The organiser side - the competence matrix of SFSC organisers

Research and surveys have shown that small producers have difficulties to reach the market alone and therefore need to work together. SFSC organisers can help with this, as they understand market and agricultural processes, but the training of these experts is not yet developed. The development of the position of rural facilitator and the creation of the necessary teaching materials and training has been done in the framework of a project funded by the European Commission (Erasmus + KA2, Rural Facilitator Training in Agricultural Short Food Supply Chains), in which I had the privilege to participate. The countries of the research that supported the development of the training materials were the Czech Republic, France, Romania, Hungary and Poland (I collected the data in Romania in Szeklerland). The training methodology is based on the competency matrix that I will describe below.

The methodology of the competency matrix was based on desk research, which collected legislation on the operation of SFSC in the participating

countries. It also formed the basis for telephone interviews with producers, agricultural advisors and market organisers in April-May 2020. I contributed to the project with nine interviews in Szeklerland.
A short and long questionnaire was developed. The short questionnaire examined a mix of skills, competences and knowledge, while the long questionnaire addressed these separately. The 25-question long questionnaire analysed the profile of SFSC organisers in more depth, highlighting relevant characteristics. Respondents rated different skills and competences on a 5-point Likert scale. The anonymous data collection was conducted online and the questionnaire was completed by 19 participants from five partner countries (including five from Szeklerland). The majority of respondents had a Master's degree or higher and their work ranged from management to academia.
The data analysis was conducted using qualitative comparative analysis (QCA) (Sántha, 2020), which allowed for a logical analysis of the empirical data and the identification of different configurations. Country-specific opinion groups can contribute to the identification of possible educational modules.

2.2. The producer side - post harvest interviews

In this chapter, I have examined post-harvest strategies, with a particular focus on their application within SFSC. I have grouped post-harvest solutions into three categories - traditional methods, modern technology-driven strategies and community-led innovations. I aimed to validate these methods and innovations in the Szekler region.
Following convenience sampling, interviews were conducted in January 2025. 15 people were interviewed: eleven farmers and four professionals (one veterinarian, three horticultural engineers and one agricultural extension agent). The response was voluntary and subjects could stop responding at any time. The interviews were audio-recorded with the subjects' consent. Interviews varied in length from 20 minutes to 35 minutes, with an average interview lasting approximately 25 minutes.
The recorded audio material was transcribed using an artificial intelligence solution (Microsoft 365 software package), the transcript was cleaned and then subjected to thematic analysis. In qualitative research, data analysis aims at systematically examining, categorizing and interpreting observation notes, interview transcripts and other documents in order to gain a deeper understanding of the phenomenon under study (Bogdan & Biklen, 2007). Since the aim of the present research is to validate a theoretical framework as context-dependent empirical , I used deductive thematic analysis to identify patterns (Byrne, 2022). The

thematic categories were determined by the theoretical framework, i.e., I identified traditional, technology-driven and community-based strategies along the value chain based on the transcripts. For the expert interviews, I also used an inductive analysis technique to capture the issues perceived by the experts. The thematic categories in this case were developed through repeated re-reading of the transcripts and continuous refinement of the category system (Thomas, 2006).

2.3 Examining the consumer side using the Q method

In this phase of the research, I investigated the extent to which consumers in Szeklerland value the work of small-scale producers, whether they see the role of local food trade in the economy of the region, how they feel about the attitude of young people towards local products, whether they believe they will be the consumers of the future, whether they trust the origin of local products and whether they believe they are healthier than foods from wholesale chains.

Data collection was conducted in March-May 2023. Convenience sampling was used to ensure the greatest possible diversity: I selected the 35 participants so that both genders were represented, they represented all counties of Szeklerland, were of different ages and had different levels of education.

For the analysis I used a Q-method, which clusters individuals rather than variables. Many studies use different software for data analysis, I used KADE software (Ken-Q Analysis Web Application 1.2.1). For data analysis, I created a correlation matrix, i.e., I determined how similarly or differently each participant ordered the statements. The correlation matrix helped me to identify sample members (individuals) who had similar mindsets. This was followed by factor analysis (extraction), extraction was done up to 5 factors. The resulting factors were optimized using Varimax rotation to obtain the cleanest possible factor structure. The aim is to have some factors well separated from each other, so that it is easier to interpret the different perspectives.

3. Results and discussion

3.1. The Szeklerland SFSC inventory

The Szeklerland SFSC inventory (Table 1) is not intended as a scientific result but as an orientation for those interested, taking into account that data on short food supply chains are constantly changing. The SFSC systems in the three counties of Szeklerland show significant differences: while in Harghita County there is an outstanding number of milk vending machines (45), in Covasna County this service is completely absent. Mures county has the only community-supported agricultural model, while Harghita has the only functioning food hub. Producers are

very active on social media, with large buying groups, and there are also community manufactures, mobile shops, village tables, beekeeping shops and producer webshops. Together, these elements form the basis of the local food self-sufficiency. The data collected clearly show that SFSCs in the region are diverse but currently operate in an unsystematic way and that targeted support and a unified registration system would be needed to develop them in a sustainable way.

Table 1. SFSC inventory in Szeklerland

Localised food systems	Harghita county	Mures county	Covasna county
Community supported agriculture	0	1	0
Food Hub (food hub)	1	0	0
Markets and farmers' fairs (locations and events)	6	4	9
Dairy vending machines + vending machines	45	12	0
Village tables	4	1	1
Social media sales groups	5	1	4
Community manufactures, associations	2	2	
Movie stores	14	2	9
Webshops	9	5	2
Beekeeping Specialist Shop	2	1	3

Source: own collection based on DSVSA Mures (*DSVSA Mures*, n.d.), DSVSA Covasna (*DSVSA Covasna*, n.d.), DSVSA Harghita (*DSVSA Harghita*, n.d.)local Facebook groups (March-April 2022)

3.2. The SFSC organizers

Required competences of SFSC organisers

The catalogue of competences draws on the results of primary research on aspects of human resources, thus establishing a link between general

perceptions of human resources in this area and the views of respondents from mixed groups with an insight into the subject.
In Table 2, each column shows the average values obtained for a country, and column 7 shows the average for the row.

Table 2: Joint hierarchy of competences, combined table

	EN[a]	CZ[b]	PL[c]	RO[d]	FR[e]	Together
Readiness to cooperate and ability to manage cooperation	**4.83**	3.44	4.09	**4.56**	**4.54**	**4.29**
Knowledge of specific food hygiene rules for small farmers/producers.	4.42	3.44	4.64	**4.44**	3.85	**4.16**
Ability to compromise, manage conflict and find solutions that benefit all.	4.5	3.22	4.18	4.33	**4.38**	**4.12**
Creativity and ability to help implement new ideas.	**4.67**	3.44	4.18	4.33	**3.92**	4.11
Knowledge of agricultural, food processing and agri-tourism legislation.	3.75	**3.89**	**4.82**	4.33	3.46	4.05
Knowledge of specific quality assurance schemes for small producers.	4.17	**3.78**	**4.73**	3.89	3.38	3.99
Knowledge of agricultural production, food processing and tourism services.	3.92	3.56	**4.73**	4.11	3.46	3.96
Knowledge of different target group-specific marketing channels.	4.42	3.22	4	4.44	3.38	3.89
Knowledge of consumer needs and trends	4.42	2.78	4	4.44	3.77	3.88
Ability to participate in market sales	**4.83**	3.22	4.09	4.44	3.69	4.05
Knowledge of environmentally friendly solutions	4.25	2.89	4.18	**4.56**	3.08	3.79
Knowledge of grants and funding opportunities	4.08	3.22	**4.73**	3.67	3.23	3.79
Ability to assist in online sales. IT and social media skills.	4.5	3.44	4	3.78	3.15	3.77
Knowledge of food processing technologies	4	3.56	4.36	3.67	3.23	3.76
Up-to-date marketing knowledge	4.17	3	3.73	4	3.54	3.69
Ability to assist in pricing	3.75	3.33	3.64	4	2.92	3.53
Knowledge of local and regional gastronomy.	3.83	2.67	3.45	3.67	2.92	3.31

	EN[a]	CZ[b]	PL[c]	RO[d]	FR[e]	Toge ther
up-to-date information on tourism-related issues (e.g. local festivals)	3.92	2.33	2.91	4.11	2.46	3.15
International perspective, knowledge of best practices	3.75	2.78	3	4	2.08	3.12
Knowledge of a comprehensive toolbox of theatre pedagogy and animation (for active participation).	3.08	2.78	2.45	3.44	2	2.75

Note: a: HU: Hungary; b:CZ: Czech Republic; c: PL: Poland; d: RO: Romania (Szeklerland); e: FR: France.

In the combined table, the most important attribute was the willingness to cooperate and the ability to manage joint operations (4.29), which was the leading attribute for both Hungary, France and Romania. When it comes to the creation of a new profession, the willingness to cooperate and the knowledge of how to work together are essential for the professional to fit successfully into the fabric of the existing situation. The second most important attribute was knowledge of specific food hygiene rules for small farmers/producers (4.16). This attribute did not rank first in any of the countries' lists, but was more important than the other attributes ranked first in the country analysis based on the overall score. The same can be said for the two traits of Compromising and managing conflict, developing win-win solutions (4.12) and Creativity and helping to implement new ideas (4.11). One is specific knowledge for SFSCs, while the other is a soft-skill. Knowledge of agricultural, food processing and agro-tourism legislation (4.05) is the highest scoring attribute in the Czech Republic and Poland, and is the fifth item in the table. The cluster of the first five traits in order of importance shows a varied picture. The desk research suggested an emphasis on soft skills and detailed knowledge of SFSCs. In order to maximise the effectiveness of facilitators, both topics should be addressed to a significant extent in training modules.

There is variation in key attributes, with Polish and Czech results showing significant overlap in the most preferred skills. Participants from both countries are among the more experienced respondents from an agricultural point of view, and respondents from farms were the most represented in these two countries, which may be one of the reasons for the similarities. The Romanian and Hungarian results also show similarities. A significant part of the sample was made up of people with an agricultural background, which explains the common perspectives.

Analysing the Romanian (Szeklerland) data specifically, knowledge of environmentally friendly solutions (4.56) and willingness to cooperate

and ability to manage cooperation (4.56) share the first place. There is only a slight difference in the scores of the next 4 attributes, followed again by a three-way tie. These narrow rankings indicate that the desired facilitator role needs to process several equally important attributes to be effective. Possession of a comprehensive toolkit of theatre pedagogy and animation (for active participation) (3.44) also came last in this sample.
Based on the interviews with SFSC stakeholders and beneficiaries in Romania, it is clear to all that it would be worthwhile to retrain agricultural officials in the municipalities and find capable people who can communicate effectively with small farmers. There is a lot of bureaucracy in municipal work, which makes it difficult for short food supply chains to operate. The legal framework for small producers in Romania is not clear. Farmers do not have the awareness to declare their income from sales on their own responsibility, so the facilitator can also help in this respect. During the interviews, it was stressed that it is important to train good intermediaries for this work, as farmers typically only know how to produce and not how to sell.
SFSC facilitators need leadership skills to effectively support smallholders and build relationships with stakeholders. Networking, building trust and interpersonal skills are key to rural development. Knowledge of how SFSCs work, as well as market, legal and food hygiene knowledge, is essential for successful mediation. Communication and conflict management play a key role in smooth cooperation. In addition, facilitators need to have business and marketing skills to support farmers' market access and competitiveness. On this basis, six chapters have been outlined for the SFSC training material: leadership skills, SFSC-related skills, business skills, food hygiene, communication, marketing skills.
As can be seen, a very complex set of knowledge and experience is required to enable SFSC organisers to effectively support SFSCs. I will illustrate this organiser work in more detail through two case studies. Both SFSC initiatives have emerged as niche entities in the market, shaped by practice, and have shaped and created obstacles to what needs to be done on a day-to-day basis. One of them is a civil initiative (Helyénvaló food hub- Odorheiu Secuiesc), the other one is a municipal one (Székelytermék trademark- Harghita County Council). Both were born out of many years of experiential learning.

3.3. The producers side

Results of the producer interviews

In Szeklerland, small and medium, mixed farms (both livestock and crop production) are typical. Based on their main activity, a distinction is made

between mainly producers (who produce and process) and those who mainly process (i.e. buy and collect raw materials). Typically, they are entrepreneurs by necessity, a knowledge they have inherited. In selecting the interviewees, I sought to achieve diversity, so that the producers' specialities were: trout maker, gingerbread maker, backyard egg producer, vegetable grower, herb and spice processor, vegetable processor, chocolate maker, beekeeper.

Few dared to estimate their food losses. Those who did, spoke of 1%-35%. Usually they use it in the family, give it to animals, neighbours, sell it off. Based on the interviews, the following insights emerge: food loss reduction strategies can only be truly operational if producers and consumers develop and maintain the link together. Initiatives for which there were tenders and money, once the money runs out, disappear soon enough. Those initiatives that are run by NGOs operate on a small, local scale, albeit with difficulty (there are many regulatory and legal requirements to comply with). The point is that the 'task' (the importance of connectivity) needs to be owned by both producer and consumer. A good example of marketing is producer buy-and-sell groups on social networking sites, which in fact all reinforce the black economy. There is a demand from producers, but there is no will to join forces, and for this we need a strong young community of producers who are more open, who are not driven to farming by necessity, who have seen the world and have the know-how.

Producers perceive many and complex consumer demands, such as the need to pay by credit card (which is not possible for farmers, although some of them operate Revolut payments), to have as little packaging as possible (which is difficult to achieve for processed products, also due to legal requirements), traceability and to have organic/home-grown products. Consumers are often unsure about what exactly organic certification means and how it differs from backyard production. This situation is deliberately exploited by some producers, while others may give misleading information to consumers due to a lack of information.

Results of the expert interviews

The results of the expert interviews are summarised in Table 3, showing the coding process.

Table 3. Coding process, code tree - an example from the expert interviews.

Pre-defined category, general theme, based on the purpose of the research.	**Codes - specific categories developed during the analysis**	**Excerpts (examples)**
Problems with Szekler farmers' concepts of food loss	Loss is not measured	*Producers do not measure the loss at all, so they do not know how big it really is for them. No data-based product planning and monitoring. S1*
	Lack of expertise	*Lack of expertise: they cannot time, they use inappropriate technology, species selection is not correct. Lack of understanding of the importance of crop protection during cultivation: if you can detect damage early and intervene, it is key. In many cases, the damage is only noticed when it is irreversible...They don't understand that the emphasis is on prevention. It will be a long process to teach this to producers. You can't help those who don't want to. There is information available, the task requires small producers to grow up to dare to ask for help, to learn what to look for, why to do a particular thing. It's true that in the past everyone knew how to garden, but times have changed, there is a lot to look out for. S4*
	Lack of capital	*Good storage is a big investment, so they prefer to sell quickly to make a quick profit. They do not calculate what it would be worth in the long run. Sz3*
	Individualism	*Why don't they cooperate? It could be that if they produce the product in their own kitchen, they bring in their own characteristics, make the product special. Therefore they do not produce jointly. They are afraid that their income is included in a community pot. They cannot manage their income immediately. They are afraid of community work. They should start with storage, community sales. If they gave up individualism, they could break into the bigger chains. But it is likely that they can sell what they want. They don't want to be bigger. The work is enough, the volume is enough, we can sell in the countryside. Sz2*
	Lack of business knowledge	*Business thinking is still lacking. Everybody does things according to their own heart. Sz3*

In the following, I will analyse in detail the causes of food waste and the sustainability aspects in the context of Szeklerland.

Extent and causes of loss

According to expert estimates, the rate of agricultural food loss can be as high as 25-35%, but even for professional producers it can be as high as 10-15%. A significant proportion of small farmers do not measure or monitor production losses, which makes it difficult to develop effective intervention strategies. Experts have identified four main problems that play a crucial role in the development of food losses (Table 3).

First and perhaps most important, the majority of producers do not measure food losses at all. Farming is not data-driven, so there is no accurate picture of how much loss is being produced and the reasons for it. Without monitoring yields and quality parameters, it is difficult to identify effective intervention points. This particularly hampers long-term planning and the development of strategies that could reduce losses.

The second problem is the lack of know-how, which affects the entire production chain: losses already during the growing season can affect storage, processing and marketing. In many cases, producers do not know exactly the optimal growing conditions to maximise yield and quality. Shortcomings in precision farming, crop protection and agronomic interventions reduce the shelf-life of products, thus limiting marketing opportunities. Crop protection is a particularly critical area, as many farmers only become aware of a problem when it has caused irreversible damage. The use of preventive measures is low, and farmers often do not seek expert advice or have insufficient knowledge of appropriate control strategies. The use of expert advice and modern technologies is more common on larger farms, but is often out of reach for smaller producers due to financial and information constraints.

The third main barrier is lack of capital. Even those farmers who are aware of the benefits of modern technologies and solutions often lack the financial resources to implement them. In terms of storage, for example, most producers use traditional methods: storing fruit and vegetables in cellars or wooden crates does not involve adequate disinfection, humidity control or temperature monitoring, which contributes to spoilage. Although semi-precision storage solutions have already appeared among larger producers, they are still rare on smaller farms. Overall, precision storage, processing to food safety standards and the development of efficient distribution and logistics systems require a significant investment that many small producers cannot afford.

Fourthly, there is a lack of Community cooperation. Although community initiatives are still less widespread in Szeklerland, the potential of cooperation is becoming increasingly evident. The main reasons for the lack of cooperation between farmers are historical experiences and memories of collectivisation. There is still a strong individualism in the

farming community, which hinders joint marketing and the use of common logistics solutions. Some producers fear that cooperation will jeopardise their own income, while others are reluctant to participate in joint initiatives because of lack of information and time management problems. However, collective marketing offers significant opportunities. Mobile shop schemes, which for example the Rural Development Directorate of Harghita County is trying to coordinate, could help joint logistical planning, reducing individual transport costs and increasing efficiency. Community markets, food networks and buying communities could also provide a way for small producers to engage more directly with consumers.

Reducing losses and the role of circular farming

Reducing food loss is a traditional approach, mainly through circular farming. A significant proportion of food waste is not thrown away, but finds alternative uses: in animal feed (feeding pigs, poultry), composting, or family and community processing. Dairy farmers, for example, sell or process all the milk they produce, with minimal food waste. Fruit and vegetable producers traditionally use the remaining product as jam, compote or brandy, although market sales are limited.

On backyard farms, produce is often distributed among families and community solidarity helps to reduce losses. However, on larger farms, surplus food often does not find an adequate market due to a lack of cooperation with the processing industry and limited sales of second and third class products. Community processing plants, such as the Kebele Community Processing Plant in Mures County, could be a solution to this problem, as they provide producers with the opportunity to process and market their products collectively.

Consumer expectations and market adaptation

Consumer preferences in Szeklerland show significant differences by region. While in some places consumers prefer washed vegetables, in other areas they look for produce in the ground state and peel it themselves. Conscious shoppers appreciate the uniqueness and quality of local produce and are willing to pay higher prices for tasty, chemical-free products. The demand for home delivery is growing, but it is not yet widespread due to logistical challenges.

For farmers, the role of advertising and marketing is undervalued, although a more active online presence and local tourism promotions could help to sell products more widely. Visual appearance is still dominant: consumers often associate beautifully packaged products with large-scale production, while small-scale products are often marketed with

a less attractive appearance. Marketing and packaging improvements can be key to increasing market competitiveness.

As a summary of the producer and expert interviews, I systematically present (Table 4) which of the post-harvest solutions to reduce food losses presented in Table 1, which are designed to be validated in the context of Szeklerland, are present in the region.

Table 4. Relevant post-harvest solutions to reduce food losses for small farmers in Szeklerland

Stages of the value chain	Solutions		
	Traditional	Technology-driven	Community-initiated
Processing	Fermentation, pressing, pressing, drying, grinding, etc.		
Packaging	Use of traditional packaging materials (e.g. paper, glass).		
Storage	In cellars, pits, bags, sand, straw, etc.		
Pest control (in relation to storage)	Cultivation of resistant varieties, exclusion of pests (prevention); upstairs storage (multi-storey multifunctional spaces).		
Delivery	Use of own vehicle for transport to market	Home delivery supported by route optimisation	
Sales	Market, pick your own, in-house sales, etc.	Vending machines, e-commerce shop, virtual marketplace	Local food buying club, community supported agriculture initiatives (CSA, AMAP).
Advertising	Word of mouth, tastings, "dressing up the stall (and the farmer) to show authenticity".	Advertising in online media, brands	

Note: Groups of solutions that also occur in the context of Szeklerland are indicated in the table

Table 4 clearly shows that traditional solutions continue to dominate in the food economy of Szeklerland. Although technology-driven solutions are emerging in the areas of transport, marketing and advertising, community initiatives are almost completely absent. Traditional methods work well in principle in local conditions, but they do not always allow for an efficient minimisation of food losses, especially in case of higher production volumes, and individual solutions increase production and marketing risks in the long run. Problems such as seasonal overproduction or market access difficulties could be effectively addressed through joint action, but producers operate along individual strategies, which makes this type of cooperation difficult.

3.4. The consumer side

Evaluation of the Q test data

I separated the consumer clusters in terms of local food consumption and perception of the peasant way of life. During the extraction, I determined how many factors were needed to describe the opinion clusters. I performed the extraction up to 5 factors because this yielded the highest cumulative variance. I sent out the test to 97 people, of which 54 were returned and of these 35 were fully completed with no errors based on the checks. Ranking the statements nicely outlines the opinions for each factor. For each factor, I ranked the strong positive and negative statements (with which the respondent agrees or disagrees) and identified the 5 consumer types. These are:

1. Concern Conscious: 34% of respondents. This is the concerned, aware, slightly aloof consumer, respects producers, believes in the economic strength of local produce. Among the 12 respondents, there is one person with a very high profile and character, the others form two groups in the weighting of the ranks (see Annex V). Consumers in this group consider farmers' markets important, are very conscious consumers and for them it is obvious that in the short food chain less food goes to waste, less environmental impact of local products than industrial food products. They associate quality of life with the consumption of local produce and accept the scientifically proven fact that the quality of life of the consumer is determined by the quantity and quality of the food consumed. They are also aware that a large proportion of local food products are sold 'black market', bypassing taxation and food safety controls, usually through social media. For them, small-scale producers are an important element of landscape management, and it is because of the landscape that they have been able to grow in such good numbers, so their survival is also emphasised because of the landscape. They feel that local people are proud of the traditional products they consume. They believe that, although there is a large supply of products in the big food chains, there is a need for local products and they do not doubt the economic knowledge of the producers. They do not believe that the introduction of school lunches would solve the problem of selling local food. They have great confidence in the millennial generation, denying that they are looking for the best value for money products, whether or not they are made in Romania. When analysed by education and age, the Factor 1 group (34% of respondents) has the highest proportion of consumers with a university degree, masters, PhD degree (58%) and a higher education degree (25%), they tend to live in cities and 75% regularly consume local products.

2. Doubters: 9% of respondents

Doubter conscious. They are the sceptically conscious consumers who love local produce but question its provenance, are wary of market sales, and distrust young buyers. They are the young, the youthful-minded group. There are like-minded members of this factor group. This group of buyers claim that the quality and origin of products sold on social media (Facebook) is uncertain and that a large proportion of local food products are sold "black", bypassing taxation and food safety controls. This clearly undermines trust in small producers. They see a lack of interest among the younger generation in local products and advertising promoting short supply chains, and consumers want local products to be certified by a label, but do not want to pay a higher price for them. Small producers are not seen as working efficiently enough, and local products are more expensive not because of high production costs but because they are mispriced by producers due to their limited economic knowledge.
They believe that there is no evidence that local products are healthier than those produced under controlled conditions in industrial agriculture. They do not believe that small producers are unaware of the opportunities offered by food marketing and modern technologies, and that a large proportion of consumers prefer to buy local food because they know that they are helping to develop the region's economy. Factor group 2 is made up of young people and young thinkers (9% of respondents), 67% with a college degree and 33% with a bachelor's or master's degree. Two thirds consume local produce regularly, one third occasionally.

3. Cautious: 14% of respondents

Factor group name: Cautious. Distant and cautious consumers, they value scientific arguments and producers' expertise, but they do not consider it patriotic to consume local products. This group of consumers agrees that the survival of small producers is not linked to tourism and that the peasant way of life is not at all attractive to people today.
They believe that consumers' food choices are constantly changing. They have a lot of confidence in young consumers and believe that they are willing to pay more for vegetables produced in an environmentally friendly way. They see a very limited range of products in farmers' markets and would like to see the agricultural and economic skills of small producers developed to develop short supply chains. They believe that local people are proud of the traditional products they consume. They believe that modern farming practices should also be applied to traditional farming and disagree that the production of local products completely solves food self-sufficiency in the region, nor that the so-called "black market" is often a manifestation of positive civil disobedience, a legitimate protest against bureaucracy. 40% of those in factor group 3

(14%) have a higher education and 40% have a university or master's degree. They are all from small towns and 80% consume local produce regularly, 20% occasionally.

4. Enthusiastic individuals: 9% of respondents

Factor group name: enthusiastic personal. Consumers who are enthusiastic about small producers, want to have a living relationship and are familiar with the buying habits of young people. This group of consumers claims that the peasant way of life is not at all attractive to today's people, but that they need to be looked after and that it is the responsibility of local communities. They see a danger in the proliferation of markets and forms of agricultural support, because small farmers adapt to them and lose their originality and identity of work. They see that the creation of local food supply systems in Romania is justified by the very large number of small farms and that the production of local products completely solves the problem of food self-sufficiency in the region. They do not think that selling local products online is a good idea, because it undermines direct human contact. They do not agree that small producers are not managing efficiently and that the most efficient way to sell local produce is through boxed home delivery. They believe there is a link between the survival of small producers and the development of tourism. They also disagree that the local food system is more about social cohesion and that its role in rural development is not significant, and that the quality and origin of products sold on social media (Facebook) is uncertain. Group 4 (9%) represents all counties of Szeklerland and all types of administrative units. 67% have a college degree, 33% have a university or master's degree. They all regularly consume local products.

5. Flag bearers: 34% of respondents

Factor group name: flag bearer. Flag bearers, avid consumers of local produce who value small producers, solution seekers for the development of the local food system.

This factor group considers it very important for society to give enough space to farmers, because they are representatives of an ancient culture worth preserving and without them a secure food supply is unthinkable, they like farmers' markets because of the sense of community they bring. The quantity and quality of the food they eat is important to them, and they would like to see the quality of local produce certified by a label, but they do not want to pay a higher price for it. They believe that the introduction of school lunches would solve the problem of selling local food. They see tourism as a potential for local producers. They trust in the healthiness and origin of local produce and consider the local food system very important. For them, the range of products offered by farmers'

markets is sufficient, and they consider the role of the local food system in rural development to be important. They value the development of short supply chains as a conscious activity, but they are not naïve and know that the production of local products does not completely solve the problem of food self-sufficiency in the region. They see strength in the NGOs that serve this endeavour. 58% of factor group 5 (34%) have completed higher education, 42% have completed university or master's degree, 8% have completed high school. They live in villages and small towns, 50% consume local products regularly, 50% occasionally, but some also take local producers' products as gifts.

Statements distinguishing the factors

The statements that most distinguish the factor groups are clearly visible. Some statements are important for several groups, but in different ways: for example, doubtful conscious consumers do not consider local products healthier than industrial ones, while flag-bearers say the opposite. There is not complete agreement between the five groups, but certain claims are accepted or rejected by all of them. They agree that farmers are essential for a secure food supply, but at the same time the peasant way of life is not attractive to people today. The survival of small-scale farmers is a value-preserving issue and a responsibility of the local community. Farmers' markets are important not only for the healthy food they provide, but also for the community experience. Consumers want local products to be certified with a trademark, but they would not pay more for it because they trust the producers. Consumption patterns are constantly changing, which is a challenge for small producers.

The five clusters have different perceptions of the role of small producers, the product label and the economic impact of local products. A common point is the need for a local food system and the importance of developing producers' knowledge. Young people's consumption habits are poorly understood and further research is needed.

Sceptical consumers do not trust the origin of local products, but also do not trust a possible certification and would not bear the cost of it. They are more likely to trust producers rather than the products themselves, but further research is needed to understand this better.

4. Conclusions and proposals

Short distribution chains and local food systems play an important role in sustaining localised economies and are increasingly receiving attention in government support. Improving the situation of small producers depends not only on economic factors but also on the development of an appropriate regulatory and institutional environment. The development of alternative food systems depends on a number of factors, including the

number of organic farmers, the presence of community initiatives, the uptake of alternative marketing channels and consumer attitudes. Historically, Szeklerland has relied heavily on short food chains, which have evolved in response to modern trends. However, despite the growing demand for local products, the lack of knowledge of farmers, low levels of cooperation and the penetration of the global market are hampering development. However, good practices by local producers can contribute to the spread of alternative food systems.

According to the research, small-scale producers in Szeklerland use different strategies to reduce food waste, ranging from production to marketing. Barriers to community-based food processing and marketing include mistrust, logistical problems, lack of capital and market uncertainty. Historical experience and memories of collectivisation have led producers to prefer individual strategies and avoid joint initiatives. The lack of common infrastructure and adequate funding makes cooperation even more difficult.

The skills and competences identified in the research are essential for effective local food systems. Successful organisation requires teamwork, collaboration, market and regulatory knowledge, innovation and conflict management skills. Given the different priorities in different countries, training programmes need to be flexible to adapt to the specific needs of the regions. In Szeklerland, different organisations play an important role in bringing local products to the market, although the role of rural facilitator/SFSC organiser has not yet been formally established. Sustainable development requires a stable organisational background, adequate infrastructure and long-term funding.

An analysis of consumer behaviour reveals five groups based on their attitudes and preferences. Lack of confidence in the authenticity and certification of local products has a significant impact on consumer choices and therefore more emphasis needs to be placed on transparency and communication of reliability in marketing strategies.

Suggestions

Supporting local producers, reducing food losses and strengthening short supply chains are key to the development of the food economy in Szeklerland. This requires the cooperation of municipalities, policy makers and NGOs, as well as raising consumer awareness and improving market access.

The development of young producer communities and the creation of common logistics and processing systems such as mobile shops and shared warehouses can contribute to supply chain efficiency. Education,

mentoring of producers and provision of public, NGO support are essential for sustainable community projects.
The credibility and competitiveness of local products can be strengthened through certification and transparent control processes, such as open farm days or quality controls. Reaching young consumers through digital platforms can help promote certified products.
Good examples of promoting local brands are Hungarian models such as the "We are local" community brand, which values not only the products but also the experiences associated with them. The adaptation of such initiatives in Szeklerland could contribute to the development of a strong local trademark system.
Research is hampered by a lack of data, so a census of local artisanal and small-scale producers, a survey of producers' knowledge needs or a study of consumer habits could be a useful topic for university students.
Public policy measures - tax incentives, administrative facilitation, development of digital platforms, targeted subsidies - can help short supply chains to operate and be sustainable. Supporting professional training and cooperation between producers (e.g. logistics networks) can reduce costs and increase accessibility.
Common storage and processing facilities for local producers could reduce food losses and improve the marketability of products. Strengthening existing initiatives, such as the Local Food Hub and the Szekler Product Mark, as well as developing online marketplaces and indoor farmers' markets could also be important steps.
To promote local products and increase consumer confidence, awareness campaigns, community land-use programmes and training of professionals are needed to effectively manage short supply chains.

5. New scientific advances

1. The most prominent of the competences required for SFSC organisers are: collaborative skills, conflict management, knowledge of environmental solutions, IT and marketing skills, which I have been able to identify from the case studies in Romania.
2. In post-harvest management, there are many cost-effective and proven traditional and community-based solutions. It is advisable to look at investment-intensive technological solutions only after these "soft" solutions have been exhausted.
3. Food waste is caused by a lack of capital and as a consequence the use of modern technologies is hampered. At the same time, individual strategies predominate and there is a lack of community cooperation.
4. Consumers in Szeklerland can be divided into five clusters based on their attitudes towards local food and consumer responsibility. The five

consumer clusters that emerged are: concerned aware (strongly prefer local products but critical), doubtful aware (not necessarily believe in the benefits of local products), cautious (prefer scientific arguments), enthusiastic personal (strong connection with producers, personal relationships), flag bearer (actively support local producers and markets).
5. Sceptical, knowledgeable and cautious consumers are more distrustful of the origin and quality of local products and therefore less willing to buy, so the success of the trademark scheme depends to a large extent on convincing and engaging these groups.
It is not a scientific result, but it is worth mentioning that the SFSC inventory of Szeklerland has been completed, which is a very important (strategic level) practical result of the short food distribution chains operating in the region. The table can be updated, further developed and expanded.

6. Publications of the author related to the subject of this thesis

International journal articles

Molnár, J., Tóth, G. (2024). consumer clusters in Szeklerland-application of the Q method. Agricultural Economics and Rural Development, 21(2), 157-189. (Official Journal of the Institute of Agricultural Economics (IEA-AR) of the Romanian Academy) https://doi.org/10.59277/AERD.2024.2.02

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Journal articles in Hungarian

Molnár, J., Horváthné Kovács, B., Tóth, G. (under evaluation). Marketing & Management, E-ISSN 2786-3395

Benedek, Zs., Kujáni, K., **Molnár, J**. (under review). Hungarian Science (Economic Sciences Doctoral Qualification Committee IXGJO GMB [1901-] B domestic)

Other publications

Benedek, Zs ; Kujáni, K ; Major, Á ; **Molnár, J** ; Pilar, L ; Pitrova, J ; Fricz Szegedyné, A ; Szente, V. (2022): Thematic study of the BIOEAST thematic working group on food systems: Outlook of small farming production in BIOEAST countries and local food systems of alternative futures , 61 p. BIOEASTsUP H2020 project, #3 Study

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