FOOD SYSTEMS THEMATIC STUDIES #3

OUTLOOK OF SMALL FARMING PRODUCTION IN BIOEAST COUNTRIES AND LOCAL FOOD SYSTEMS OF ALTERNATIVE FUTURES

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

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List of abbreviations

AKIS	Agricultural Knowledge and Innovation Systems
BAU	Business as usual
BOND	Bringing Organisations and Network Development
CAP	Common Agricultural Policy
CEE	Central and Eastern Europe
CSA	Community Supported Agriculture
EESC	European Economic and Social Committee
EPRS	European Parliamentary Research Service
EU	European Union
FAO	Food and Agricultural Organisation
Farm2Fork	Farm to Fork
FAS	Farm Advisory System
FM	farmers' market
FNS	food and nutrition security
FOX	Food processing in a Box
FQS	food quality schemes
FRI	Food Relocalization Index
FS	Food System
H2020	Horizon 2020
HoReCa	Hotel Restaurant Catering
ICT	Information and Communication Technology
IQR	interquartile ranges
LAG	Local Action Groups
LEADER	Liaison Entre Actions de Développement de l'Économie Rurale
LFVI	Local Food Vitality Index
LI	Locavore Index
LFS	Local Food System
NGO	Non Governmental Organisation
NUT	Nomenclature of Territorial Units for Statistics
PSFP	public sector food procurement
R&I	Research and Innovation
R&I&Edu	Research and Innovation and Education
RUR-CSA	Rural Renaissance - Coordination and Support Action
RURALF	Rural Facilitator
SALSA	Knowledge based Sustainable vAlue-added food chains: innovative TooLs for monitoring ethical, environmental and Socio-economic impActs and implementing Eu-Latin America shared strategies
SFSC	Short Food Supply Chain
SKIN	Short food supply chain Knowledge and Innovation Network
SMAHR	Social Media Analysis
SMARTCHAIN	Smart Solutions in Short Food Supply Chains
SME	Small and Medium Enterprise
SRIA	Strategic Research and Innovation Agenda
Strenght2Food	Strengthening European Food Chain Sustainability by Quality and Procurement Policy
TWG	Thematic Working Group
U.S.	United States of America
UNIDO	United Nations Industrial Development Organisation

1. Executive summary

The study focuses on how the local food system can contribute to and be an integrated part of a sustainable food system based on the 3 main elements of BIOEAST TWG (Thematic Working Group). European Economic and Social Committee (EESC, 2019) emphasises that short chains and agroecology represent a new prospect for agriculture in Europe. The results of several research projects financed by the EU Commission on the one hand, confirm that SFSC offers an effective solution to the challenges of sustainable food production. Another important finding of the research projects is that there is not enough input data and methods to analyse the operation and activities of SFSC and the economic, social and societal expectations of the actors in the chain.

The research confirms that the local food system can make an effective contribution to meet the 4 strategic areas needed to achieve the goals set by the TWG:

- Strategic Area 1: Sustainable Food Production (PRODUCTION)
- Strategic Area 2: Power and information in the food system: strengthen the food environments and vulnerable actors in the food chains (FOOD CHAINS)
- Strategic Area 3: Research, innovation, technology and investments for future sustainable food systems (RESEARCH)
- Strategic Area 4: Promoting sustainable food consumption and the shift to healthy, sustainable diets (CONSUMERS)

Ten main barriers for the uptake of R&I project results and fostering local food system in the BIOEAST region:

- This study makes an attempt to provide solutions by Horizon 2020 projects. Many of these solutions however are long term solutions, some of them require fundamental changes in approaching the problems.
- Many of the H2020 projects provide such a list of hardship which prevents farmers from more effective production and entering the market. While they do not provide recommendations on how that should be cured, what specific policy instruments should be introduced.
- Data is often collected by NGOs or non-statistical-focused institutions, or even enthusiastic individuals, lowering data reliability. Moreover, these data often concern one specific date; time series data are usually not available, making trend analysis challenging.
- Shortage of farmers at local level: low quality and/or availability of products and low diversification of products to supply; insufficient know-how and entrepreneurship; inadequacy of collective organisation; poor equipment and logistical infrastructure; difficulty in communicating the specificities of local products to consumers.
- Several projects made a collection of online (sometimes interactive) platforms to share information on innovative solutions, capacity building, knowledge sharing etc. for farmers and consumers. However, they will only be useful and used if the target group may read it, i.e., these internet pages have been translated to local languages. In many cases the translation is made pro bono in R&D&I projects because the language barrier is not in the focus.
- Hygiene standard and control procedures are a good example of regulatory hindering factor for SFSCs, since they may be very costly to comply with for SFSCs, while some of the rules, tailored for big agri-food industry, are not always relevant for small quantities or very direct sales. Many R&D&I projects aim to elaborate new measures, technologies where

local authorities are involved to ensure their applicability (e.g.: mobile slaughterhouse project in Austria, Latvia, Finland, common processing point in France). In spite of the acceptance of local authority the adaptation is not automatic into the practice of other countries.

- The lack of business knowledge, business planning, inflexible business models, lack of entrepreneurial culture are generally hindering factors of small scale farming, however in CEE countries the small farmers are in a cumulatively disadvantageous situation.
- Many researches were conducted in the BIOEAST region however their mosaic characteristic and unrepresentativity do not serve properly the evidence based policy making.
- The examined R&D&I projects and EU reports concerning LFS and SFSC mainly focus on the Western European circumstances which do not provide equivalent suggestions for CEE countries.

Ten important identified key drivers for developing the local food system in the BIOEAST region are:

- COVID-19 situation changed the game. More consumers turned to local products and more direct trustworthy channels. More studies proved that SFSC awareness increased (from slightly to highly) as a result of the pandemic. Similarly, the COVID-19 situation seems to have positively affected the perception of SFSCs in all three countries.
- Regional food production is supported by strong marketing communications in the Czech Republic, which results in a constant increase in the number of certification schemes. Regional food labelling may be an interesting marketing support for small- and medium-scale agricultural and food enterprises (e.g. local farmers) who have a limited budget for their marketing and business investment.
- Food production and consumption habits are basically based on family traditions and customs therefore not only region but country specific awareness programs are needed based on the nationally conducted consumers' perception research.
- Organic production and market demand show a continued growth from year to year, in 2020 the market grew considerably faster than in previous years due to the COVID-19. Consumers turned to clean health and wellness products and paid more attention to disease prevention. Short food supply chains may have a significant role in organic product supply which may be reinforced by the knowledge/food/digital agri hubs financed by R&I funds.
- Regulatory systems depend on many and complex factors while they are very much diverse due to historical, geographical and political past. Therefore, policy and regulatory measures and instruments should avoid the fit-for-all approach. Moreover R&I projects could provide concrete national based legislative recommendations.
- The future AKIS has a crucial role to involve those actually marginal actors who will be able to bear a part in local food systems. AKIS is that instrument which can contribute to capacity building in the case of elder farmers or new entrants and may handle the national differences.
- Special advisory services in AKIS for SFSC by which helping the small holding to meet the expectation and of the consumers and market demand is essential and means a big lack actually: knowledge transfer through advisory services and vocational training, helping them to understand what consumers need.
- Scientific programmes should be introduced to discover the means and measures with more focus on the Eastern-European regions. H2020 BOND project is a good example that practice field visit and study tour is one of the significantly effective ways to open new interest and for developing business skills and create good grounds for collective actions.

- The observation of data gathering in the official agricultural census to follow up the structural changes in LFS is recommended. In the US and French census the gathered data: the value of the production (in m€ and UAA) which is sold via SFSC; number and size of farmers who buy via SFSC.

The study observed the alternative scenarios presented by the BIOEAST Foresight report and the Local Food System Scenarios introduced by the FOX study. Based on the examined scenarios and the expert panel exercise the paradigm shift for a more sustainable local food system has been started in the BIOEAST countries. Almost all the scenarios count with the local food ideology as the embedded part of the holistic food system. It also means that governance should accept its presence and focus on the value chain approach to strengthen the position of small and family farms in CEE countries in the frame of the Farm to Fork Strategy. The improvements of SME's capacities rely not only on on-farm capabilities, but also on the general enabling economic and institutional environment, both on a regional, national and international level.

2. Background

The transforming value chains and agricultural trends and requirements such as the generation turnover, modernisation and ability of resilience to climate change will present major challenges for the actors of the agriculture in the BIOEAST countries. Particularly those countries face serious difficulties whose agricultural structure is still based on the traditional small farming production or on a dual system (with big companies and small farms, without middle size companies). Besides, social factors, such as food security, food waste, and an ageing population, already impose pressures on the current and future food system (Breznina, 2020.)

In the 1990s, movements were launched primarily in Western Europe and the United States to rebuild locally food production. The most typical examples were subsistence farms, direct sales from the farm, community supported agriculture (CSA), and producer market movements (Hayden et al, 2011). In these cases, the role of local communities was to preserve ecological values, support self-sufficiency, co-production, or exchange and sell locally.

The sourcing of local products was initiated mainly from the big cities, where food was available almost exclusively in supermarkets. The small shops selling local groceries disappeared or fell drastically, so they bought little or no fresh groceries. Only the predominantly processed food supply on the shelves of large shopping malls was available to the consumer. Consumers have not been in contact with food producers. Morgan et al. (2006) call these places “placeless foodscape,” Wrigley (2002) and Reynolds (2005) call them “food desert”. One of the results of these market effects is the raising consumer awareness towards the farmers and root of the food. Thus, from the beginning of 2010 several community-supported agricultural initiatives (CSAs) have emerged: box system, local product purchasing group, urban food groups (Hendrickson and Heffernan, 2002). More and more alternative food sales are emerging and “local”, “alternative” and / or “quality” food production is increasing (Ilbery et al., 2005).

Food scandals are also among the causes of the emergence of alternative food systems. Consumer confidence in standardised food production in developed countries has shaken, and at the same time, ethical expectations have increased, and consumer-conscious behaviour has become more pronounced (McMichael, 2008; Weatherell et al., 2003; Chambers et al., 2007).

The development of local food systems has been profoundly different in the BIOEST countries and the Western world (including the U.S.), both in terms of production and consumption. After 1990 the retail revolution happened remarkably fast in Central and Eastern Europe (Dries et al., 2004; Swinnen and Maertens, 2007), which resulted in additional difficulties for small-scale farmers when they tried to join modern food distribution channels (Bakucs et al., 2012). Furthermore, farmers from post-soviet countries have an extremely low willingness-to-cooperate (Bakucs et al., 2012) in spite of the fact that collaboration has been shown to promote the transition towards local and more sustainable food systems (Lutz et al., 2017). The acceptance of local food is relatively high in the BIOEAST countries. For example, the culture of direct purchasing remained strong after the collapse of socialism, mostly due to the continuing existence of conventional markets, informal economies and traditional agricultural households (Kneafsey et al., 2013). Moreover, the rate of food self-provisioning is also observable, (Jehlička and Smith 2011); it acts as a survival strategy in some countries (Alber and Kohler 2008; Mincyte 2011), while serves as a hobby and as a way of obtaining healthy food in others (Jehlička et al. 2013, Vávra et al., 2021). To conclude, as pointed out by Balázs, 2018; Goszczyński and Wróblewski, 2020; Kopczyńska, 2020 and other authors, the changes in BIOEAST food systems are the results of specific and characteristic dynamics.

Special attention should be paid to the examination of the organic production development, which provides a good example that globalisation of supply could lead to a drastic increase in consumption of organic products, and over time, confronted consumers with the same product.

Organic farming has a particularly long tradition in Austria. It was one of the good practises for the development in the EU legal framework of organic production. The first organic farmer was officially registered in the 1920s and around 400 “Bioneers” made sure that the first health food shops could be stocked in the 1980s. The main wave of change towards organic food followed in the 1990s, when a domestic supermarket chain started to feature organic food on the shelves of all its stores. This meant that it was easier to coordinate supply and demand and the organic farmers had secure, long-term takers of their produce. The success proved this ambitious attempt to be right: only a few years later every supermarket chain had its own organic brand in its range of products.

In the 1970s, organic production was considered an alternative to industrially produced food (Buck et al., 1997). But dissatisfaction with organic products grew in the 1990s because organic products were significantly more expensive than conventional foods. The main reasons for this were lower yields from extensive production and strict production-restrictive regulations. Thanks to globalized trade, organic products have become available not only at the place of production but also in other countries and continents. The cost of long-distance transport, the resulting burden on the environment and the use of plastic packaging have caused consumer resentment and partly turned away from organic products. However both organic production and market show a continued growth from year to year, in 2020 the market grow considerably faster than in previous years due to the COVID-19. Consumers turned to clean health and wellness products and paid more attention to disease prevention (Willer et al., 2021). The tendencies can be observed on Figure 1.

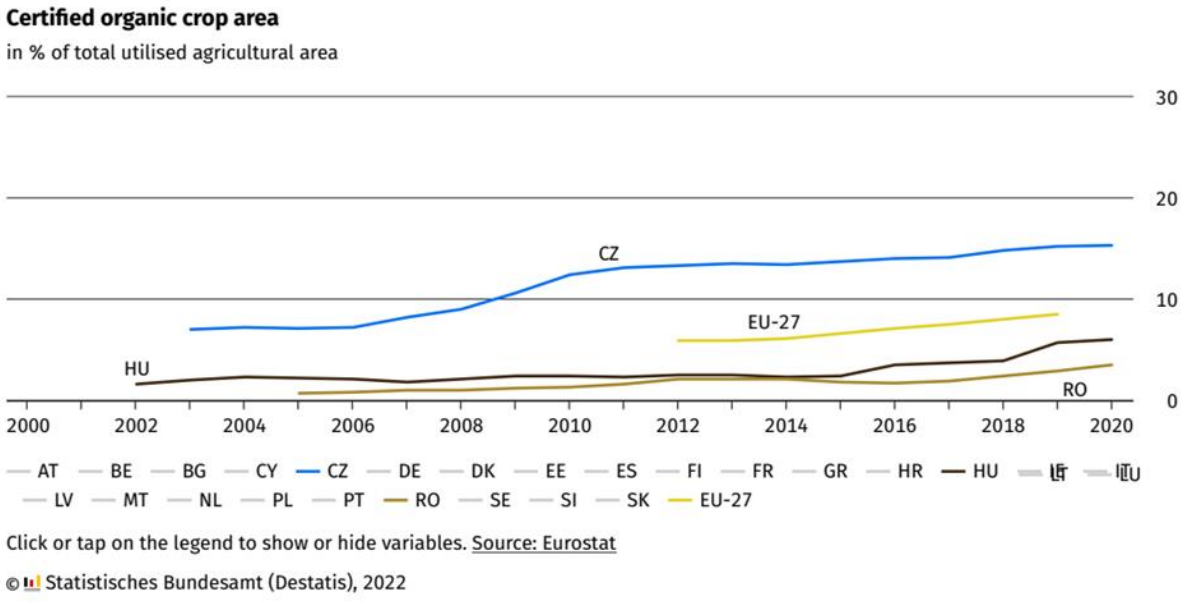

Figure 1: **Certified Organic Crop Area**

Source: Eurostat, 2022

Winners of consumer trends are also local products and production systems. This also led to the launch of a “post-organic” movement with the aim of obtaining locally produced, environmentally friendly food directly from producers (Moore, 2004; Blythman, 2005).

Many studies examined how the future food systems could answer the environmental, economic and social challenges, and the promotion of local food systems is typically mentioned as a possible strategy to foster supply chain transition and to improve social sustainability of the current systems. However, local food systems are not without challenges either. Small-scale farmers have multiple roles to integrate with often minimal external help or advice. Many farmers are old and/or lack the skills to efficiently cope with the challenges of modern times. The quality and the quantity of the produce often hinder or complicate the participation of these farmers not only in conventional supply chains, but also, in modern and fruitful marketing channels of local food systems.

The issue of local food supply has attracted considerable political and public attention, due to the changing preferences of consumers, who have more awareness about ecological sustainability, in particular, but also due to recent developments concerning the COVID-19 pandemic (Voglhuber-Slavinsky et al. 2021).

The EU defines local food systems as systems where production, processing, and retail take place within a defined geographical area, and by the closeness of social relationships between the producer and consumer (Augère-Granier, 2016). Although this definition has been supported by other authors (Kneafsey et al., 2013, Martinez et al. 2010[6], Hendricson et al. 2015), the term depends on the characteristics of sustainability in the local area, such as urban or rural structure.

One of the main issues arising from policy is what kind of food system we want – a system that would be able to serve the complex needs of consumers and let the rural actors work in a more sustainable way.

2.1. Objectives

The main objective of this study is to identify alternative pathways and scenarios for the local food system in the BIOEAST region and to define those regional based research needs which will be able to strengthen the local food systems.

In order to delimit the main scope of research needs and to determine those innovation areas which require further development in the designed territory we entitled the tasks to be carried out:

- Examine the existing local food systems and their indicators in Romania, Hungary and Czech Republic using statistical data and social-economic analysis from previous projects and researches;
- Assess the applicability of some specific indicators of local food system development within the framework of BIOEAST agri-food scenarios;
- Evaluate the existing projections with a special regard on their influences on local food system;
- Specify measures which determine the improvement of local food systems (such as formation of more local food value chains serving various goals, actions for reduction in CO2 emissions due to shorter transport distances, the promotion of the local economy, and strengthening of rural areas, as well as the provision of fresh and diverse food, etc.);
- Define those research fields and missing data bases, information which can reinforce these measures.

2.2. Methodology

A secunder and primer analysis were performed to understand the main challenges and bottlenecks of the local food system in the BIOEast region. The main purpose was to get a wider picture on the current status of the local food system and to have a deeper understanding on the limitation factors of further development. Among them we intended to define those indicators which may be applied for creation of scenarios and formulation of a comparative analysis of the national food systems.

2.2.1. Literature review

Several research projects (Strenght2Food, SMARTCHAIN, SKIN, Fox processing in the box, BOND, RURALF, etc.) worked on the assessment of environmental, social and economic aspects of local food systems, providing relevant data for further analysis. These research projects which were funded by the European Innovation Fund carried out a deeper analysis about the indicators, hampering and success factors of the local food system. However, these reports provided a general European overview, mainly with a strong focus on the European best practices. The reports of focus groups, questionnaires, impact analyses, and other publications were elaborated and synthetized, with a special focus on the scenarios identified by the BIOEAST Foresight Exercise which determine a new approach to our literature review.

2.2.2. Social Media Analysis (SMAHR)

Social media is now a part of many individuals' everyday lives. At present, social networks are used by around 3.6 billion people worldwide, and it has been predicted that more than 4.41 billion people will use social networks in 2025 (Tankovska, 2021). When comparing this predicted number of social network users with the predicted global population for 2025 (8,184,437,460 inhabitants) (Worldometer, 2022), this indicates that approximately 54% of the planet's population will use social networks by 2025. This is therefore a pertinent source of data with the potential to increase both the number of users and shared content.

Moreover, users increasingly spend more time on these platforms, and create active and passive digital footprints through their interactions with other platform users (Apuke, 2017). These data have a strong research potential in many areas, especially considering that understanding people's communication on social media is essential for understanding their attitudes, experiences, behaviours, and values (Thang et al., 2020; Pilař et al., 2017).

Based on the analysis of the hashtag #localfood was selected because by this definition it is possible to identify important elements that affect the prediction of the local food area in the monitored area. The other key words as #shortfoodsupplychains, #localfoodsystem did not provide valuable data for two main reasons 1) they are less used it is a more specific term that users do not use so often 2) they are used as part of the text together with #localfood.

The data analysis was based on the SMAHR framework (Pilař et al., 2021). SMAHR is a framework that is focused on Social media analysis based on hashtag research. The hashtag is a specific part of the message that begins with a "#" character. On social media, the hashtag has two primary functions: filter posts, where the algorithms of social networks display an archive of messages related to this hashtag (topic) based on a specific hashtag, and the second function of hashtags is the way how to emphasize values, experience, attitudes and opinions in the message. In the case of a local food, it can emphasize the properties of Organic, through the hashtag #organic. Organic is a property of food that may not be obvious from the text and photography. This framework has been already used in research focusing on organic foods (Pilař et al., 2021a), farmers' markets (Pilař et al., 2018), sustainability (Pilař et al., 2019a),

corporate social responsibility (Kvasničková et al., 2020) and gamification (Pilař et al., 2019b). The data analysis process based on SMAHR framework consisted of five steps:

1. Data acquisition: The Twitter API (Twitter, 2021) was used to obtain messages (Tweets) from communications on the social network Twitter. The data were recorded between 1 January 2010 and 30 September 2021. The software captured messages that used the hashtag #localfood. During that period, 397,471 Tweets of 118,343 unique users were captured. This dataset contains all messages that contained the hashtag #localfood in the monitored period, which users sent to the Twitter social network.
2. Content filtration: As our analysis only focused on hashtags, all words that were not preceded by the hashtag symbol ("#") were removed. This led to a dataset that consisted purely of hashtags (i.e., words beginning with the symbol #).
3. Content transformation: Subsequently, all letters were transformed into lower-case letters to prevent potential duplicates (e.g., the software might consider #Vegan, #vegan, and #VEGAN as three different hashtags). A further correction was made to break up strings of connected hashtags, e.g., "#vegan#organic" was converted to "#vegan; #organic". The dataset was imported into Gephi 0.9.2, where a hashtag network was created based on hashtag interdependence.
4. Data mining: The following methods were used to describe the hashtag network:
    a) Frequency: The frequency is a value that expresses the hashtag frequency within a network.
    b) Eigenvector centrality: This is an extension of degree centrality, which measures the influence of hashtags in a network. Eigenvector centrality is calculated based on the premise that connections to hashtags with high values of degree centrality values have a significant influence than links with hashtags of similar or lower values of degree centrality values.
    c) Community analysis and modularity: The most complex networks contain hashtags that are mutually interconnected to a more significant extent than they are connected to the rest of the network. Cluster of such hashtags are called communities. Modularity represents an index that identifies the cohesion of communities within a given network. The purpose is to identify hashtags communities that are mutually interconnected to a greater degree than other hashtags. Networks with high modularity show strong links between hashtags inside the community and weaker links between hashtags in other communities.
    d) Visualization of the network: Network visualization aims to identify individual communities and their mutual position. After importing the data into the Gephi program, the network's visualization is concentrated in the basic square without visualizing the different relationships between individual hashtags. This visualization is unsatisfactory in identifying communities and their mutual positions but does not affect the analysis of hashtag-level and network-wide characteristics. In the field of visualization, it is possible to use the ForceAtlas2 algorithm. ForceAtlas2 is an improved version of the ForceAtlas algorithm, which focuses on large networks.
5. Knowledge representation—a procedure that uses visualization tools to represent the results of data mining. Knowledge representation is based on the synthesis of individual values and outputs from the data evaluation phase.

2.2.3. Indicator Assessment

In order to evaluate whether certain goals (including the Sustainable Development Goals, or the goals appointed by the European Green Deal) have been achieved, trends and processes need to be monitored. However, the selection of the set of relevant indicators is often challenging (Hák et al., 2016). In the current report the most frequently used indices of local food system development have been reviewed and their applicability is assessed within the scenarios proposed by the BIOEAST Foresight Exercise (Section 2.3.1).

A number of policy-relevant indices exist related to sustainable food consumption Benedek and Balázs (2016). However, the number of measures focusing on local food systems is low; measures include the advocacy-driven Locavore Index (LI), and the academic Food Relocalization Index (FRI, Ricketts-Hein et al., 2006). LI presents an annual ranking of the 50 states of the US and the District of Columbia, created by a Vermont-based non-profit company (The Strolling of the Heifers). LI was introduced in 2012, when there was very little data available indicating how much local food was consumed in each state, thus indirect measures, as proxies for the real metric (the dollar value of local food sold in each state) were applied, such as the number of farmers' markets, food hubs and CSA programmes on a per capita basis. However, two related questions have been incorporated in the Census of Agriculture since the introduction of LI: 1) The value of food sold by farmers directly to consumers (at farmers markets, farm stands, CSAs and direct online sales), and 2) The value of agricultural products sold by farmers directly to local retailers, institutions, and food hubs. These two metrics, combined, describe how much food is sold locally in each state, through all channels. LI mainly focuses on marketing possibilities, which, though an important area from a producer's perspective, tells nothing about the details of production.

The other metric, FRI, is a unique measure in the sense that statistical data associated with local food activity are used, structured and analysed. The Index was developed in order to map and reveal the strengths and weaknesses of different socio-economic aspects of local food activity in England and Wales. Due to the context dependency of the composing indicators, FRI cannot be used directly elsewhere, but an adaptation is required. Benedek and Balázs (2016) provided an adaptation in the Hungarian context, which was used as a starting point in the current analysis, amended by the components of the original Locavore Index (Table 2 in Section 2.4). The extracted indices are often used in the literature for the characterization of local food system development, some example sources are provided Table 2. These indices are easy-to-collect and easy-to-use, and available for both smaller and larger scales, and (potentially) in the case of all the BIOEAST countries.

There is a further measure (a newer construction) in the context of local food, the Local Food Vitality Index (LFVI, Woods et al., 2017). LFVI measures twenty different components of local food system performance (in terms of marketing channel performance, community engagement, local food promotion), by quantifying individual perception on a five-point Likert scale. Thus, LFVI may provide useful information on where investments in the community might effectively be made. The advantage and the disadvantage of the LFVI lies at the same point: though the results are of interest for policy, the index addresses consumers, thus primary data needs to be generated; the index therefore is not included in the current analysis.

During the Indicator Assessment, the approach of Voglhuber-Slavinsky et al. (2021) was followed. The guiding question was whether to what extent an indicator might be used in the different possible identified futures? First, our panel of experts characterised the status of local food systems in 2050, within each scenario. Then evaluation scales ranging from -1 to +1 were applied to quantitatively measure the opinions of experts concerning the applicability of indices;

-1 meant that an indicator was not probable to be useful or relevant in the given scenario, 0 meant that an indicator was neutral (or was not supported nor hindered by the framework conditions in the scenario), and +1 meant that the application of the indicator in the given scenario might be meaningful and relevant during the characterization of a local food system. The expert opinions were collected, and the results were discussed. The medians and inter-quartile ranges are reported in Table 2, while detailed descriptive statistics of the expert panel are displayed in the Appendix.

2.2.4. Method of characterisation of local food system development in the Czech Republic, Hungary and Romania

The current status of local food systems was assessed qualitatively in the Czech Republic, Hungary and Romania, and also, comparatively, based on some specific indices: the number of local food certification schemes, the number of farmers' markets, and the number of CSA initiatives. The number of farmers' markets and the number of CSA initiatives are indicators used in the Locavore Index. Combined, they are expected to give a broad overview about the current status and trends of local food system development. These indices were amended by the number of certification schemes, which shows the engagement of farmers towards regionalism, and the level of activity of intermediaries that have a crucial role in facilitating LFS development (Balázs, 2012; Benedek and Balázs, 2016). Though some problems with data availability emerged, these measures were available for most of the focal countries for more than one year.

2.3. Policy framework

The BIOEAST initiative recognized the importance of analysing and getting a better understanding of the food system in CEE countries. The cooperation intends to identify measures to the major challenges such as climate change, its migration, a growing world population, urbanisation and resource scarcity, in addition to the "triple burden" of malnutrition (undernutrition, obesity, and hidden hunger), ageing and food poverty.

Therefore, the purpose of cooperation within the BIOEAST Thematic Working Group on Food Systems is to increase participation and influence the policy-making process of research and innovation in the field of food systems in the macro-region, as well as to actively represent the CEE countries in debates on EU Research and Innovation (R&I) policy framework, including FOOD 2030 strategic plan (Chmieliński, 2021).

According to the TWG there is a particular need for a policy narrative advocating a complex approach to research and innovation on food systems and connecting producers and consumers, engaging a wide diversity of actors to build innovative and integrated value chains concerning sustainable farming systems, environmental challenges and human health.

That is why the objective of the current study is to provide an input to the discussion on development of a part of the food systems in BIOEAST countries in relation to research (and data) needs and evidence-base for the policy making. This thematic study focuses on the local food system that should make a valuable contribution to the macro-regional development by implementation to the BIOEAST Strategic Research and Innovation Agenda (SRIA).

The food system is composed of sub-systems (e.g. farming system, waste management system, input supply system, rural (local) systems etc.) and interacts with other key systems (e.g. R&I&Edu system, energy system, trade system, health system, etc.) (FAO, 2018., Chmieliński,

2021). As the alternative or local food system is one of the pillars of the sustainability processes that underpins the significance of our topic.

The BIOEAST TWG FS SRIA is composed by 4 strategic areas and topics which all strategic areas include recommendations how to develop the different elements of local food system, such as:

- Research topic 1.1. Ensuring sustainable food production by human and financial investment – innovation, skills and technology shift;
- Research topic 2.1. Promoting sustainable short food chains, initiatives and new green business models in food processing, wholesale, retail and food services;
- Research topic 2.2. Cooperation of primary producers to support their position in the food chain and non legislative initiatives to improve transparency;
- Research topic 2.3. Tackling with food fraud along the food supply chain;
- Research topic 2.4. Development of information hubs to connect farmers and primary producers with potential customers to promote the formation and consolidation of sustainable short food chains;
- Research topic 3.2 Food system dynamics modelling & risk management at local level;
- Research topic 3.5. Improve the production with the help of digitalization in the agriculture and food sectors;
- Research topic 4.4. Educational framework for sustainable food use and the shift to sustainable diets (e.g. new nutrient profiles to restrict promotion of food high in salt, sugars and fat) (Chmieliński, 2021).

Regarding the listed research topics one may conclude that the local food system has several connections with the strategic areas therefore the study aims to articulate evidence that makes a base for the Thematic SRIA and will support directly the analytical part of the Agenda.

3. Main outcomes

3.1. Review of existing studies and to sum up the main findings on local food system

This chapter aims to review those R&D&I projects which topics were acting forward on local food systems. Those projects were preferred in which the CEE countries were in the spotlight and/or verbalised concrete proposals for this region. The selected projects focused on the short food supply chains nevertheless their outcomes unfold to other aspects of local food systems which provide valuable information for the holistic approach. This chapter tries to identify the macro-region specific issues, challenges which the current local food system faces with and those measures of the future food system which are capable of answering the dilemma of the regional rural economy of the BIOEAST countries. During this analysis the policy connected recommendations, proposed policy instruments were mainly monitored in order to appoint the missing evidence which require further observations.

3.1.1. Projects and studies specially focusing on short food supply chains

SMARTCHAIN was an ambitious three-year (2018-2021) Horizon 2020 RDI project which aims to foster the development of the short food supply chains (SFSCs). The objectives of the project were to create a strong and enduring partnership among stakeholders in and between SFSCs using the multiactor approach and to identify innovative and practical solutions to barriers that restrict the scaling up of SFSCs. The project intended to reflect different types of short food supply chain models, to generate more precise, quantitative data regarding the impact of short food supply chains for a determined area and/or products as well as to capture the degree of geographical diversity across the EU.

The project has been based on 18 case studies (SFSCs) selected in 9 partner's countries (France, Germany, Greece, Hungary, Italy, Netherlands, Serbia, Spain, and Switzerland), which have been studied from several points of view by the other partners of the project. Moreover, the project founded 9 SFSC innovation hubs in order to facilitate the data collection from case studies and to strengthen the communication between SFSC stakeholders.

SKIN, the Short Supply Chain Knowledge and Innovation Network was an ambitious EU H2020 project (2016-2019) that focuses on the domain of SFSCs and involves 21 partners in 14 countries. SKIN aimed to systematise the existing knowledge, fostering demand-driven innovation, building long-term collaboration among European farmers and cooperatives, facilitate stakeholders' engagement and promote innovation through demand-driven research in the short food supply chain domain.

The aim of the project was "re-connecting the two extremities of the food supply chain, reconciling producers with citizens, stimulating mutual trust, and establishing a short chain based on common values on food, its origin and production method."

The ultimate objective was to establish a permanent association of stakeholders, working on the improvement of SFSC's efficiency for the economic growth of the sector for the benefits of European farmers and citizens.

Strength2Food project was a five-year project (2016-2021) with the aim to improve the effectiveness of (i) EU food quality schemes (FQS), (ii) public sector food procurement (PSFP) and (iii) to stimulate Short Food Supply Chains (SFSC) through research, innovation, and demonstration activities. It was a 30-partner consortium representing 11 EU and 4 non-EU countries combining leading academic, communication, SME and stakeholder organisations to ensure a multi-actor approach. The project was conducting case study-based quantitative research to measure economic, environmental, and social impacts of FQS, PSFP and SFSC.

There was a qualitative analysis performed in six European countries (FR, HU, IT, NO, PL and the UK) to assess the practices of multiple supply chain actors, and a quantitative analysis to compare the impacts of SFSCs to that of mainstream 'longer' retail alternatives (Strength2Food, 2021).

Bond Bringing Organisations and Network Development to higher levels in the farming sector in Europe was a three-year project (2017-2020) with the participation of peasant movements, small farmers' civil organisation, large cooperatives, universities, specialised agency (UN FAO) with 17 EU and non-EU partners from 12 countries (Kislépték, 2021).

BOND contributes to unleash, strengthen, and organise the great potential for collective action and networking of individuals, groups and entities of farmers and land managers, focusing on countries with lower organisation levels, with a view to creating strong, dynamic and effective organisations that have a voice and a place in policy design. BOND investigates and addresses the constraints and disincentives, in order to reach a higher level of participation of farmers.

SALSA assessed the role of small farms and small food businesses in delivering a sustainable and secure supply of affordable, nutritious and culturally adequate food. SALSA identified the mechanisms which, at different scales, can strengthen the role of small farms in food systems and thereby support sustainable food and nutrition security (FNS).

The analysis was conducted in 30 regions across 19 countries in Europe and Africa. SALSA-researchers collected data from the selected reference regions through a combination of desk work and interviews with experts of regional food systems, small-scale farmers and representatives of small food businesses.

- 892 small farmers were interviewed and 109 regional food systems analysed.
- In each region between 2 and 4 key products were selected for in-depth analysis of regional food systems and small farms, each of them with acknowledged regional economic and cultural relevance.
- Detailed regional food system maps were produced and validated in focus groups and regional workshops.
- Findings were grouped into four macro-regional areas: Africa, Central & Eastern Europe, Northern Europe and Southern Europe.

- The project set out to examine a potentially very important role of small farms, their contribution to food security. Research was conducted in 11 Eastern European regions (NUTS3 level) of 7 EE countries (Romania, Poland, Latvia, Lithuania, Bulgaria, Croatia and Czech Republic.

Rural Facilitator for Short Food Supply Chain is a two-year project (2019-2022 as prolonged) which aims to explore the possible ways on how to generate the position of a rural facilitator and to develop the necessary learning materials and training tools to train individuals who intend to take this new profession in their career. Desk research was conducted prior to the development of the curriculum to reveal the SFSC ecosystem of the partners' counties (CZ, FR, HU, PL, RO), thereafter a competence catalogue was prepared discovering the required knowledge and skills of the rural facilitator supporting farmers in organising the supply chain from production to market access.

FOX (Food processing in a Box) is a project in which more than 25 European partners aim to transform large-scale technologies for the processing of fruits and vegetables, to small, flexible and mobile units in local neighbourhoods. Within the project, a foresight exercise was carried out to draw three alternative pictures of the future ("core scenarios"), how the European food sector could look like in 2030. For first, the baseline was set by the identification of the variety of trends influencing the food sector today.

The United Nations Industrial Development Organisation (UNIDO) released its guide on Short Food Supply Chains (SFSCs) in 2020, titled *"Short Food Supply Chains for promoting Local Food on Local Markets*, by Giovanni Belletti and Andrea Marescotti, gives an insight over the main typologies of SFSCs initiatives and discusses their potential benefits and drawbacks. The ultimate goal is to raise consciousness on the potential of SFSCs initiatives for achieving local development, better market access to smallholders, and higher food quality to consumers, and to discuss how these initiatives may be developed in a sustainable way, allowing for higher resilience in front of global market disruption.

3.1.2. Region specific outcomes and policy recommendations based on researches

SFSCs have gained political attention in recent years with EU rural development and food policies emphasising that SFSCs can generate economic, social, and environmental benefits that contribute to sustainability. However, scientific evidence on the economic, social, and environmental impacts of various types of SFSCs has been, until recently, mixed and scattered, lacking a comprehensive and holistic assessment.

Justifying our previous assumption, a commonly shared view of SFSCs is that they may strengthen farmers' position in the value chain and tackle unfair trading practises, whilst providing greater added value, contributing to local economic development, and operating in a more socially and environmentally responsible way. For many consumers, SFSCs represent a

means to access high quality, fresh, locally sourced produce, as well as a way of contributing to the social life of local communities. These SFSCs have the potential to stimulate consumers' interest in the value and origins of food, as well as strengthen social relations.

Several studies identify the complex problems in SFSC farmers are facing, among them there is a compact summary made by UNIDO (2020) publication:

Shortage of farmers at local level:

- low quality and/or availability of products and low diversification of products to supply,
- insufficient know-how and entrepreneurship,
- inadequacy of collective organisation,
- poor equipment and logistical infrastructure,
- difficulty in communicating the specificities of local products to consumers.

BOND project Regulatory Framework study specifically examined the legislative solutions applicable to small producers, ultimately the legal environment of the local food system. It was ascertained that the regulatory systems of the examined European countries depend on many and complex factors while they are very much diverse due to historical, geographical and political past. Therefore, those several policy and regulatory measures and instruments proposed in the revised projects have to be carefully measured and assessed and to avoid the fit-for-all approach.

The revised projects identified problems/bottlenecks in the local food systems which can be grouped in Table 1. Many of the H2020 projects provide such a list of hardship which hinders farmers for a more effective production and entering to market. While they do not provide recommendations on how that should be cured, what specific policy instruments should be introduced. This study makes an attempt to provide solutions. Many of these solutions however are long term solutions, some of them require fundamental changes in approaching and solving the problems. They are the following: change in the educational system i.e., introduce business knowledge already in the primary school studies. Pupils have to be educated on business thinking, trained to be able to express opinions, be able to ask, to be able to make presentations, explain their needs and ideas. In the revised studies an often mentioned obstacle is the complicated regulatory framework of the countries, too many regulations which provide too detailed rules and hinders compliance. A simple activity such as farming and entering the market requires complex administrative, accounting and taxation knowledge which is beyond the value, the straightforward doing in farming. The difficulty in applying and complying with regulations makes the daily life of the people frustrated and having a constant fear for the consequences and ultimately, often one simply does not follow.

Similar problems might be perceived with the subsidy rule and eligibility. Both the eligibility rules for subsidy as well as the subsidy accounting rules (mainly in Rural Development Programme) are so complicated that small farmers do not even apply for them. Should a regulation be easy to comply with, more people would follow them. Certainly, in many countries the non-compliance is deeply in the mind of the people so a long time should be provided for the transition.

Besides education, easy to understand government communication on the applicable laws is a crucial means. There are several such platforms, but they are either out-dated or as complicated in the explanation as the law itself. The government communication should be fragmented in focusing on one specific matter using only some sentences and then the following topic should be discussed in another page. Several projects made or intend to make a collection of internet pages to share information for farmers and consumers. However, they will only

be useful and used if the target group may read it, i.e., these internet pages have been translated to local languages. The other point is sustainability, i.e. once a project is over, the collected information should be maintained and updated or merged to another already existing platform.

Table 1: **Problems/bottlenecks in the local food systems**

Farming and production:	
Problem/bottleneck	Policy recommendation
Lack of business knowledge, business planning (RuralF), Inflexible business models (SKIN); Lack of entrepreneurial culture (SKIN)	Start education already in primary schools and follow up later. Provide national (ex) Farm Advisory System (FAS) free, publicly-funded services for small farms, increase the level of training of staff, diversify services beyond informing about basic CAP conditionalities. (SALSA) National Agricultural Knowledge and Innovation Systems (AKIS) strategies should pay particular attention to incentivizing universities to cooperate with small farms and their organisations. (SALSA) Provide specific training to producers (marketing, regulations, digitalization, consumers' preferences, transparency, etc.) (SmartChain)
How to make added value to product (SKIN);	Support innovation brokering by linking different actors of SFSC and the science, to make sure that the right expertise and knowledge would be involved in the SFSC. Workshops and trainings financed by EU and national rural development funds.
Enough and proper information about the market and consumer demands (SKIN);	Agricultural chambers should provide a specific, easy-to-understand market analysis updated annually. Actually these analyses are not available or do not exist for small farmers and food producers.
Physical infrastructure, such as storing and processing capacities (Romanian FoodHUB);	Foster (through targeted EU and Member State development measures) local reindustrialization (slaughterhouses, mills, shared processing plants, etc.), and their adaptation to handle small and seasonal productions. (SmartChain) Ensure social sustainability, retaining jobs, creating new jobs, retaining the population.
Logistic issues in transportation and collecting the products, re. sufficient quantity (FoodHUB)	Provide funds and support targeting where real needs and ability: promoting the use of innovative solutions, support development of easy IT applications. Involve eligible stakeholders via Rural Development Programmes.
Ensuring consistent quality, taste and freshness of products. No tools for validation of nutritional and health attributes (SKIN);	Introduce practice oriented vocational training: learning from each other, involving professionals and research institutions.
Price competition with conventional/large scale food systems (SKIN);	Introduce tailor-made subsidies for investments and marketing activities to lower the burden of fix costs. (SKIN)
Unable to access technological innovations.	Collect and provide a platform for easy access to technological innovations.

Lack of applied IT skills, website development, Ineffective use of social media (SKIN)	Involve and use effectively regional knowledge centres in cooperation with educational, research institutes and production companies for vocational training. Make tailored-made training for rural actors according to their needs and daily routine. Motivate rural actors to develop IT skills. Improve regional village hubs for educating digitalisation Make technology providers interested in knowledge transfer and vocational training, e.g.: applying dual education tools.
Poor rural infrastructure. Poor internet service. (SKIN)	Develop internet service in the country for nationwide internet service covering the full country. Invest in people and community in rural areas to make people remain in rural areas. Develop better road connection and transportation to have an easier and quicker connection to regional markets. (SALSA)
Marketing and promotion	
Problem/bottleneck	Policy recommendation
Missing expert advice to labelling and quality systems (SKIN);	Easy to understand platform with proper information. Allow and support local civil organisation works for knowledge sharing.
No effective communication on product and quality because of lacking knowledge and resources (SKIN);	Develop marketing skills of farmers by practice oriented trainings. Support training sites and experts who develop appropriate curricula and training topics. Encouraging producers to increase their knowledge.
Social capital and soft skills	
Problem/bottleneck	Policy recommendation
Lack of trust among farmers for collective actions (BOND); Reluctance to join collective initiatives	Support collective action, sharing and networking initiatives that bring together small producers (horizontal networks), small producers and other stakeholders of the value chains (vertical integration) and SFSCs individual initiatives. Special attention should be paid to the real empowering force of the different cooperation modalities that are supported, ensuring that producers keep the decision power, and the control on their products and prices. (SmartChain) Adopting FAO material prepared in BOND project: Empowering farmers and their organisations through the creation of social capital
Difficult to find appropriate value chain partners (SKIN); lack of collaboration (BOND);	Support innovative brokerage. Programs such as LEADER Cooperation measures, youth projects financed under the Erasmus+ program and potentially other National Educational Programs can be used for youth in rural areas for encouraging the development of soft skills in rural areas, such as leadership, cooperation, and trust, especially among youth and cooperative leaders, in order to drive change in less dynamic and open communities. (SALSA) Support collective action, sharing and networking initiatives that bring together small producers (horizontal networks), small producers and other stakeholders of the value chains (vertical integration) and SFSCs individual initiatives. Special attention should be paid to the real empowering force of the different cooperation modalities that are supported, ensuring that producers keep the decision power, and the control on their products and prices. (SmartChain)

Networking along the supply chain and in the region (SKIN);	Enter into force special measures (tax, establishment, investment aid etc) to keep the workforce in place. Organise local networks with support of facilitators who know the local actors and endowments.
Difficult to engage consumers (SKIN)	Promote consumer communication campaigns at EU, Members State and regional level. Expand consumer knowledge to increase consumer engagement. Demand driven communication on local food production.
Ageing of farmers (SALSA).	Apply measures for generational renewal such as Young Farmers' support in such a way that the eligibility criteria for these require simplification and adaptation in order to allow small farms to be competitive when applying for such calls. (SALSA)
How to find a suitable person who can act as a coordinator/mediator/facilitator? Mainstream advisory system primarily supports conventional products. (SKIN)	Develop and operate a mentoring system in which professional organisations, associations, research and educational institutions also play a role. Train them, use RuralF training material. (RuralF) National/regional CAP managing authorities could make Local Action Groups (LAG) under LEADER eligible as farm advisors. (SALSA)

The analysis showed that with an increase of subsidy uptake, more developed governance structures emerged, and more active participation surfaced. Small farms in most European regions are highly dependent on EU and State monetary support. Less developed economies, where subsidy uptake is low and regulatory frameworks are less evident, are more reliant on cooperatives and help from neighbours. The other conclusion is that the future AKIS has a crucial role to involve those actually marginal actors who will be able to bear a part in local food systems. AKIS is that instrument which can contribute to capacity building in the case of elder farmers or new entrants.

Small farms, which are also the core elements of short food supply chains, would need a tailor-made specific scheme in the subsidy and support system specially in CEE countries in order to support equalising their market position. As SALSA project pointed out "Regarding CAP funding, stakeholders encourage CAP managing authorities to provide stronger support for small farms seeking to develop short supply chains through cooperation measures during the post-2020 programming period. The budget allocation for educational promotion towards consumers and social media promotion of smaller brand products should be increased. Eligible set-ups should include consumer-driven initiatives, direct buying groups, 'pick-your-own' farm visits, physical and online shops, mobile applications and Community Supported Agriculture (CSA) initiatives. NGOs, LEADER Local Action Groups (LAGs), Foundations, as well as tourist HORECA points (as a distinctly helpful actor in this configuration) should still be eligible to apply under such arrangements".

In order to discover the means and measures scientific programmes should be introduced more focusing on the Eastern-European regions. BOND is a good example that practice field visit and study tour is one of the significantly effective ways to open new interest and for developing business skills and create good grounds for collective actions.

Special advisory services for SFSC by which helping the small holding to meet the expectation and of the consumers and market demand is essential: knowledge transfer through advisory services and vocational training, helping them to understand what consumers need (SKIN).

SALSA was proposing that under the Agricultural Knowledge and Innovation System, comprehensive and publicly funded Farm Advisory Systems are needed, ones tailored to the needs of small farms. As part of such a reform, services should be diversified to respond to the growing information needs of small farms regarding business development (including cooperative structures), new production systems and technologies, climate change and agroecology (SALSA).

HORIZON-CL6-2021-GOVERNANCE-01-27 “Developing EU advisory networks on consumer-producer chains” is totally in line with both the need for specific advice about SFSC-related issues in the primary sector, and to develop a network at EU level to share this knowledge and “facilitate the upscaling of short supply chains”. Practitioners are asking for very concrete tools, techniques and knowledge, in terms of logistics, transport, processing, packaging, sales, marketing, etc., so that the approved projects should develop very ready-to-use materials, taking into account the needs detected in SMARTCHAIN and other SFSC-related projects. (SmartChain)

The consumer wants to obtain several local products from SFSC. To be as wide as possible to get a selection of local products they need to connect with several different types of SFSCs. The definitions of the operation of SFSCs should be clarified so that local products are available to consumers outside local supply chains. Short supply chains must play this intermediary role.

The area of BIOEAST countries is neither large in the EU nor worldwide. The system governing the operation of the SFSC must therefore be designed to provide access not only to the immediate regions of the (big) cities area but also to other local products produced in the outermost regions of the country.

It is also necessary to examine the sales opportunities and conditions of local products from the perspective of local producers. The legal, economic, social and technological conditions enabling local producers to reach consumers within the SFSC framework must be ensured. Local products can only play an economic, social and cultural role in a region if the actors in the food chain in the region - from producer to consumer - jointly find and develop their local products. Facilitators who know not only the economic, natural and cultural endowments of the region, but also the people involved in the production of local products, have a huge role to play in this process. The willingness to cooperate is very low in the CEE countries, so one of the important preconditions for the development of local food systems is to be able to encourage cooperation.

3.1.3. Regulatory Framework

Many of the revised projects identified that the regulatory frameworks ruling farming, small farming and short food supply chains in the given Member States are complicated, complex and expensive to apply and comply with. If small farms are to continue making contributions to the societal challenge of meeting the growing demand for food, they will need a favourable “enabling environment” (policies and other mechanisms) that addresses their broad range of practical day-to-day needs. (SALSA) One important trigger, from psychological approach is reduction and simplification where a small food operator as entrepreneur has to obey regulation: food legislation (safety, hygiene, labelling), taxation, trade and employment laws (SKIN) Flexible supportive regulations on defining agricultural activity, for start-ups, tax facilitations, fostering collective actions, special regulations for family farms, indeed, ensure the economic and social sustainability of farmers (BOND).

Several workshop organised with the participation of small farmers and producers, agro touristic service provider, SFSC stakeholders and civil organisation supporting these works under the projects (SALSA, SKIN, SmartChain, BOND) revealed that the main obstacle is that regulation does not distinct the scale of the activity, while regulations are tailored for large scale operation and business, specially hygienic rules, food processing rules, trading regulations and event waste management and by-product rules.

Dutch Focus group in the SmartChain project formulated this problem as follows: “The lobbies of the agri-food mainstream industry are very powerful and have a very strong influence on politics. Most of the regulatory framework ruling the sector are tailored for ‘the big boys’ and leave quite few margins of adaptation for smaller and alternative initiatives”. The state-of-art study of SmartChain also detected that National policies are mainly aimed at global trade. Decades of globalist policy has had a negative effect on the local/regional logistics and economies. Therefore, SFSCs have not been recognized, nor acknowledged in national policy frameworks. Current situation suggests that the definition of „local” is misunderstood in many countries. Local farmers and producers are not sufficiently protected. Import of cheap food from third countries affects domestic products and producers.

SmartChain was specially focusing on short food supply chains however its statement applies to local food systems as well. Hygiene standard and control procedures are a good example of regulatory hindering factor for SFSCs, since they may be very costly to comply with for SFSCs, while some of the rules, tailored for big agri-food industry, are not always relevant for small quantities or very direct sales. European food safety and hygiene rules are very demanding and complex, composed of different layers of legislation. Tailored for big agri-food industry, they turn out to be difficult and costly to fulfil for SFSCs organisations, often run by young farmers lacking capacity and skills in these areas and without sufficient institutional support in meeting requirements, while preventing risks that are sometimes irrelevant in this type of business. The so-called hygiene package is governed by a principle of flexibility, but its application by national authorities varies significantly, and this disproportionate treatment across the EU may put small farmers at a disadvantage compared to farmers from other countries. In many cases there is a lack of definition of “small quantities”, “small farmer” and “local”, that can potentially be excluded from the scope of the regulation, and some Member States adopt more stringent rules than EU general standards (SmartChain). The Food and Venitery Office detected in its report from 2015 “Some related concepts, such as “small [food business operators (FBOs)]” seem to not always be understood by national competent authorities, nor “applied in a consistent manner”. According to this report, “a number of factors contribute to this situation, including the absence of or inconsistent national policies on the circumstances and conditions under which flexibility may be granted.” This is not a call for reduction of food safety standards, as SmartChain emphasises, but the point is rather to encourage and harmonise the implementation by national authorities of the flexibility principle provided by the European legislator, in a more accustomed way, proportionally and consistently with the associated actual risks to be prevented, recognizing the specificity of SFSC businesses on the basis of objective and relevant criteria of definition, in order to alleviate them from unnecessary administrative burden, costly and invasive requirements and control procedures.

The lack of differentiated regulation for small, medium and large producers is evident in the case of food processors. In many countries there is no small processing plant regulation both in the primary and processed production (small bakery, small butchery, jam production, artisan cheese makers, etc.), which could operate under regulation (hygiene, administration, professional qualification, infrastructure, environmental protection, taxation, etc.) tailored to its size and economic potential. (BOND) Therefore an EU regulatory framework should be elaborated,

which describes the requirements for the Member States to create a regulation on mobile or community used slaughterhouses. (SmartChain)

The access to public procurement contracts is an important element in the viability of SFSCs, and may be a key driver to boost the transition towards shorter and more sustainable food supply chains. However in several countries, especially in CEE countries, access for several local stakeholders is still limited. There are already many EU level communications but local level practically detailed procurement regulations are still missing specially the implementation of green and social criteria in public food procurement, including criteria favouring sustainable SFSCs, caring for environmental issues, fostering the empowerment of small producers and the development of rural economies and communities in the Member States (SmartChain) Strength2Food H2020 project tackled the issue of sustainable public food procurement, and published a Strategic Guide in 2021.

Introducing special, differentiated tax systems and tax incentives under objective sustainability criteria for small scale businesses and/or for small scale farming would be an effective enabling instrument to improve their production and market positions. The Council Directive 2006/112/EC of 28 November 2006 on the common system of value added tax provides for a special scheme for small enterprises. If their annual taxable supplies of goods or services remain below a certain limit, they may be exempt from VAT (and would then not be able to deduct the input VAT either) (SmartChain)Differentiated income tax may also support the diversified farming activity which fosters food processing and activities related agriculture and food processing such as agro tourism and social farm services. Some countries already apply tax exemption below a certain amount of income or related to the economic size of the farm holding which should be more generally applied within the EU and the amount should also be revised in order to ensure a fair amount for living. Tax administration may also be simplified for farmers if incomes derived from activities related or supplemented to agriculture would also be part of the farming taxation (BOND)

BOND also called attention to the limited resources of small farming where farmers are busy with the production, marketing and sales of their products, producers have no time left to dedicate to administrative issues, and they often lack skills and knowledge about food safety and hygiene standards. This was reinforced in SmartChain project by proposing:

- Establish guidelines for Member States about flexibility measures, providing clear definitions and objective criteria of exclusion/derogation/adaptation.
- Provide specific training on flexibility to national competent authorities.
- Financially support and advice SFSCs in the fulfilment of health and safety measures and controls.
- Provide specific training and advisory services to SFSC.

The revised projects highlighted several obstacles, bottlenecks from the economical, environmental and social aspects of the local food chain. The list is exhaustive but the capacity of this study could not cover many of these matters. SALSA project called attention to the priority of natural resources and climate change issues. SmartChain made a comprehensive policy recommendation (D7.5) and a road map (D9.4) covering almost all relevant matters of the local food chains and proposed in-depth policy and regulatory solutions for the longer term.

3.1.4. BIOEAST Foresight Exercise

The aim of the exercise is to support the BIOEAST Member States in developing their sustainable bioeconomies (including circular bioeconomies); opinions of key stakeholders were collected in order to construct equally applicable scenarios. Two time frames appear in the foresight exercise: the European Green Deal, together with the EU Biodiversity Strategy and the Circular Economy Action Plan, has set goals to reach by 2030. The latter, alongside the EU Farm to Fork Strategy, the EU Climate Pact and the EU Methane Strategy, has set goals to reach by 2050. Due to the high complexity and interdependence between the different sectors and stakeholders engaged in the circular bioeconomy transition, the government should primarily focus on inter-ministerial collaboration and harmonised regulation, the document suggests.

- **Scenario 1. A fully thriving circular bioeconomy - "Superheroes"** ("the most-wanted future"). The fully sustainable future is characterised by waste-free production; collection and reuse of by-products where possible; implementation of high-level technology and practices like precision farming; modern surveillance and monitoring systems; data collection and analysis; and extensive attention to the reduction of GHG emissions at all stages and processes. Farmers are educated and well use national resources. Though old economic metrics are used, new business models are developed, collaboration, public-private partnerships and public governance are widespread. Governance is top-down, with some bottom-up integration.
- **Scenario 2: A linear bioeconomy - "Pretenders".** Competitiveness is "glorified" in this scenario. Biobased solutions are regarded as an opportunity to become more competitive. Only minimum effort has been invested in the adaptation of measures to fight the climate crisis and the pandemic. Sustainable Development Goals are respected at a declarative level, but in practice not much has been done. Business models are just slightly adjusted; most solutions are not aligned with circular economy principles. Natural resources are managed by technology and smart use of data. Old economic metrics are used, traditional value chains persist. Instead of full cooperation, competing businesses engage in coopetition; synergies of different stakeholders are not exploited. Governance is primarily top-down.
- **Scenario 3: Business as usual - "Unchangeables".** Conservative and traditional approaches are praised, digitalization and other 'western' concepts (such as circular bioeconomy) are worrying. Short-term thinking results in the intensive use of fossil fuels; exploitation of natural resources continues, including the cultivation of monocultures. Climate change action is not in the focus. In spite of increased competition, potential synergies of different stakeholders are not utilised. Globalised value chains prevail, traditional business models are applied, old economic metrics are favoured. Governance is primarily top-down.
- **Scenario 4: A nonprofit circular bioeconomy - "Change agents".** The guiding principle is "having enough" instead of "being rich". New circular biobased business models are emerging. Secondary biomass is efficiently used, natural resources are taken care of, agroecology and permaculture are typical. Purpose-driven actions are becoming mainstream; people are educated and willing-to-adapt to the changing situation. The focus of socio-economic development is shifting entirely to environmental sustainability. Political support is present, and strong engagement of all stakeholders in the co-creation of policy-making is a well-established practice. Personal (and societal) development is prioritised, new economic metrics are introduced, educated farmers cooperate, social innovations boost. Short value chains prevail.

3.2. Indicator Assessment

The aim of the Indicator Assessment Exercise was to evaluate the applicability of the most frequently used indices of local food system development in the light of the four BIOEAST scenarios. Although sustainable food systems are characterised in the scenarios, the context of local food systems is not introduced. Therefore, the first task of our expert panel was to characterise the possible status of local food systems in the alternative futures.

In scenario 1 ("A fully circular bioeconomy") the focus originally is on competitiveness at higher (national or regional) scales. However, as alternative agriculture is continuously popular in the BIOEAST countries, it is expected that local food systems will persist. Negative and positive trends have been identified with respect to local food systems. Climate change and market conditions are expected to act in favour of higher scales in order to ensure competitiveness; however, these trends might be offset by the general civic awareness, as well as the higher level of education among farmers. Although the rate of food-self-provisioning is expected to increase in rural areas, urban inhabitants will still be in need of trustworthy and ethical food. The need for certification schemes will be also strengthened by the prevalence of public procurement of local food. Channels that are based on cooperation of the actors (ensuring scaling up), as well as ICT-based solutions that allow fast and convenient shopping of individual consumers are expected to flourish. In spite of the importance of cooperation within this scenario, individual farm households might persist e.g. through CSA initiatives, as the diversity of actors is acknowledged in order to ensure sustainability.

Scenario 2 ("A linear bioeconomy") is for "pretenders", only those actions are implemented that are spectacular, and are expected to increase profit in the short term: no real paradigm shift will happen. Diversity of actors is not important, all the conditions (climate change impacts, focus on competitiveness, application of modern technology) favor big players. The role of small-scale farmers will decrease, their survival is ensured only in the organic context. It means the structural changes of the farming system in these countries towards industrial agriculture. Government support will be smaller, consumer support depends on actual trends. Local food will be sold mostly through large retailers, under their own brand, using their own labels.

In scenario 3 ("Business As Usual") no remarkable change in the relative importance of specific marketing channels is expected. Economic conditions will not let the development of the local food sector, the niche market character of local food remains. The local food production based on traditional know-how will determine an open air museum character. Farmers operating at the smallest scales (semi-subsistence farms) will disappear, bigger players (professional farms that produce food for sale) can be more efficient, and thus they survive. In terms of channels, convenience will be a key aspect. Farmers' markets and box schemes unite and move online, coupled to home deliveries. Food hubs serve as special kinds of supermarkets, they are also based on the combination of ICT tools and drive-in and home deliveries.

Mainstream and alternative systems completely split under scenario 4 ("non-profit circular bioeconomy"). The former operates according to the principles of a linear bioeconomy, but the latter also has its broad base. The importance of organic production decreases, it is replaced completely by local production. Certification schemes are important mostly in a fair trade context, these labels are searched for by conscious consumers. Local food labels are less important; direct relationships (or authentic intermediaries such as buying clubs) enhance trust. Farms of very small scales are important, and many consumers practice food-self-provisioning.

After identifying local food systems in all the possible different futures, the expert group assessed the applicability and usefulness of the most frequently used indicators of local food

systems in the second step. Table 2 displays the indicators used in the calculation of the Locavore Index, and the Index of Food Relocalization, that quantify local food system development. Detailed descriptions are placed in the Appendix.

Table 2: **The applicability of indices in the four BIOEAST scenarios**

		A fully thriving circular bioeconomy - "Superheroes"		A linear bioeconomy - "Pretenders"		BAU		A nonprofit circular bioeconomy - "Change agents"		Median	Avg IQR
Indicator	Source (example)	Median	IQR	Median	IQR	Median	IQR	Median	IQR		
Number of organic farmers	Ricketts-Hein et al., 2006	1	0	1	1	1	0.5	0	0	1	0.38
Number of farms producing food for sale ("professional farms")	Balázs, 2012	1	0	1	0.5	1	1.5	1	0	1	0.5
Number of local food certification schemes	Benedek and Balázs, 2016	1	0.5	1	1	0	1	1	0.5	1	0.75
Number of small-scale farmers	Benedek and Balázs, 2016	1	0	0	0	-1	1	1	0	0.5	0.25
Number of local food buying clubs/box schemes	Szabó et al., 2019	1	0.5	0	1.5	-1	0.5	1	0	0.5	0.63
Number of CSA initiatives	Brown and Miller, 2008	1	1	0	1	-1	0.5	1	0	0.5	0.63
Number of farmers' markets	Brown and Miller, 2008	1	0.5	0	0.5	0	2	1	0	0.5	0.75
Number of food hubs/cooperatives	Matson and Thayer, 2013	1	0	0	1	0	2	1	0	0.5	0.75

Note: IQR: interquartile range.

Almost all the focal indices are expected to be useful under scenario 1 and 4. However, the agreement of experts is more similar in the latter case (the interquartile ranges, IQRs are almost at their minimum). The biggest differences in expert opinions exist in the BAU scenario - this is the only scenario where the value -1 is allocated to some indices.

The last two columns summarise the results for each index, thus they reflect their overall importance. First, the median value of the medians are reported, while the last column shows the average deviations of the IQRs from zero. Those indices are considered important and relevant that are considered important in most of the scenarios (thus they are characterised by higher median), and the more the experts agree about them. (In other words, collecting data for these indices appears to be worthwhile). Therefore, the index 'number of organic farmers' is considered to be the most important index in general to characterise local food system development as it appears to be the most applicable if all the scenarios are considered. Indices describing the number of entities within specific channels are the least important - the future role of different marketing channels highly depends on the actual scenario, and expert agreement becomes smaller and smaller, thus the uncertainty of these results is the biggest.

There are further potential indicators that could characterise the development of local food systems from diverse perspectives, including, but not limited to: the number of local food public procurement initiatives; the number of farm shops/local food shops; the number of local product festivals; the number of farmers selling at farmers' markets; the number of farmers/consumers involved in local food buying clubs; the number of consumers involved in CSA shemes; the number of organisations (and/or consumers) involved in public procurement schemes; consumer spending at specific SFSCs (especially farmers' markets, CSA initiatives); the market share of conventional markets and farmers' markets; characteristics of products marketed in SFSCs (product range, quantity, quality), etc.

Currently, several reasons hinder the detailed characterisation of local food system development, especially at larger scales, even if local specificities (e.g. popularity of one specific channel, or a specific local regulation concerning another mode of sales) are considered. For example, existing data is not freely available in one or more BIOEAST countries. Furthermore, data is often collected by NGOs or non-statistical-focused institutions, or even enthusiastic individuals, lowering data reliability. Moreover, these data often concern one specific date; time series data are usually not available, making trend analysis challenging.

3.3. Presentation of the current situation in 3 countries

This chapter provides a wider picture about the current situation in the chosen countries in order to identify their innovation and intervention roadmap to achieve the EU and national policy objectives (determined in different strategies like Farm2Fork).

3.3.1. The characteristics of short food supply chains in the Czech Republic

The Czech Republic has recently begun to develop its local and sustainable food market (Hrubá and Sadílek, 2021). The total area where any form of sustainable farming practices are used has grown from 480 ha to 494,661 ha between 1990 and 2015 (Ministry of Agriculture of the Czecz Rep., 2016).

Micro- and small producers often sell their produce through alternative marketing channels, e.g., farmers' markets (FMs), cooperatives, or local selling networks (Zagata, 2012). Though producers' markets have a long history in the Czech context, similarly to other CEE countries, often resellers sold conventional products at these markets, without any added value. However, new, 'western' type farmers' markets emerged in the autumn of 2009 in Prague, as civic initiatives, which was followed by a boom in the spring of 2010 (Spilková et al., 2013). Soon FMs spread all over the country, reaching a massive base, unique in the Czech local food scene (Zagata, 2012), though this trend was confined mostly to the urban settings, without major impact on rural areas (Spilková and Perlín, 2013).

The first box scheme appeared in 2008, after the publication of the guide book of the Ministry of Agriculture about starting and managing box schemes in order to distribute organic products (Vaclavik, 2008). Box schemes gained momentum after the spread of FMs in 2010.

The market share of farm gate sales is estimated to be marginal, due to the low number of enterprises that process products on farms, and also, the strict hygienic rules (Zagata, 2012).

The first CSA initiative was established in 2009 and 2010, based on the French AMAPs, and it was soon followed by other experimental groups. In spite of the relatively high level of recognition around these initiatives, the number of participating actors remained relatively low, which questioned the transformative potential of CSAs in the Czech context (Zagata, 2012).

Allotment gardening has a long history in the Czech Republic. An allotment is an equipped plot, used by an individual person or a group of people for non-commercial cultivation of fruit, vegetables, and ornamental plants and recreational purposes. Allotments may be managed by local authorities, private or public bodies, or by an allotment garden association (Drilling et al., 2016). Allotment gardening is primarily not economically motivated, but run as a leisure activity (Jehlička et al., 2013). After a decline in allotments in the 1990s, a revival trend formed with the increasing outreach of the local food movement. Still, allotment gardening is considered a minority practice, as only 11 percent of 'prosumers' (40 percent of the overall population) grow their fruits and vegetables in allotments, while the majority (71 percent) uses their private garden for this purpose (Tóth et al., 2018).

The biggest negative milestone for the local food area in the Czech Republic was COVID-19, especially in the area of restricting the farmers' market. In 2020 and 2021, farmers' markets throughout the Czech Republic were suddenly reduced in connection with the epidemiological situation (OSU, 2022). On the other hand, there was a shortage of fruit and vegetables on the Czech counters due to import restrictions, and their price was rising. People were not interested in expensive goods. On the contrary, the farmers' markets were domestic vegetables that were sold. "The biggest hit was seasonal vegetables and herbs. Customers could buy spinach, leeks, asparagus, the first greenhouse tomatoes, various types of salads, radishes, onions, radishes, kohlrabi, dill, coriander, mint, lemon balm, rosemary and more. The demand was huge, certainly comparable to the time before the pandemic, if not greater, " (Flowee, 2020)

3.3.2. The characteristics of short food supply chains in Hungary

The culture of local food remained strong in Hungary after the collapse of socialism, mostly through conventional markets, informal economies and traditional agricultural households (Kneafsey et al., 2013). The market share of conventional markets and farmers' markets (the most important marketing channels of local food systems) in the sales of fast-moving consumer goods is estimated to be constantly around 4-5% since 2000 (Szabó, 2017), in spite of the rapid expansion of multinational retail chains (Bakucs et al., 2012, Dries et al., 2004). Consumer demand (and the diversity of direct marketing channels) is the highest in and around the capital, Budapest; furthermore, in other bigger cities as well as in popular holiday resorts, such as the Balaton area.

Food self-provisioning is relatively high in rural areas. 36% of Hungarians are engaged in food self-provisioning practices (and 56% of rural residents; 7% of people living in Budapest) (Balázs, 2016). 47% of individual farms are involved in subsistence agriculture.

Direct marketing provides the exclusive livelihood for many of the numerous small-scale producers involved. The characteristics and motivations of producers involved in local food systems (LFSs) are similar to those known from the literature (Benedek et al., 2018). They typically cultivate at small and very small scales. While older and less educated farmers prefer traditional forms of direct marketing (e.g. conventional markets, farm gate and roadside sales, etc.), younger and more educated farmers (often 'urban refugees') tend to use innovative marketing channels (such as farmers' markets, box schemes, consumer buying groups).

The number of farmers' markets (FMs) started to increase greatly after 2012, when the legal basis of the operation of FMs, including relieving the regulations of selling at FMs as opposed to conventional markets and market halls, was delivered. The positive trend was broken after the outbreak of the COVID pandemic. The ongoing operation of markets was explicitly encouraged by the Ministry of Agriculture. Nonetheless, many of them closed, as local organisers (mostly governments) did not want to take any political or other risks. A few markets chose to operate online, on a pick-up-only basis. Restrictions on movement allowed only citizens of over 65 years of age to enter shops or markets between 9:00 AM and 12:00 PM. This time period largely covered the usual opening hours of farmers' markets, which experienced a substantial drop in turnover (Benedek et al., 2020). Though the number of operating markets slowly recovered, many customers turned towards alternative modes of sales.

According to the directory of the NGO 'Association of Conscious Consumers', the number of farms participating in community supported agriculture (CSA) schemes is around 15; these farms supply fruits and vegetables for 2-3,000 people, which did not change after the outbreak of COVID-19. The importance of consumer purchasing groups is similar; however, this marketing channel involves more producers than CSA, though they typically consider this channel only as a part of their risk-sharing strategy, thus do not rely exclusively on it (as opposed to many CSA-farmers). Consumer purchase groups have been identified as great winners of the COVID-pandemic (Benedek et al., 2020).

Although local food public procurement is possible legally, there are only sparse examples for ongoing schemes. The importance of the HoReCa sector confines a low number of producers only, at specific localities, such as the Balaton region. Bigger changes may be awaited from 2023 when the new short food supply chain public procurement regulation enters into force. It declares that the kitchen obligated to public procurement must procure 80% of local products compared with the total value of food.

3.3.3. The characteristics of short food supply chains in Romania

Romania, similarly to other CEE countries, faces a dualistic agricultural structure: small farms (an estimated three million farming households, cultivating less than 5 hectares) account for 93.1% of all farms but only 29.7% of the agricultural area (Ministry of Agriculture and Rural Development of Romania, 2017). These smallholders are perceived in two contrasting ways (Havadi-Nagy, 2021): one prevailing view believes that these farms create a dead weight for the Romanian agri-food sector, while others see them essential for the Romanian economy for the development of sustainable consumption strategies facilitated by SFSCs. The NGO sector is convinced that SFSCs might facilitate the revival of small-scale farms and processing units. They could even have a very important contribution to the development of rural tourism (Tanasă, 2014). However, in practice, food trade is increasingly carried out in large retail chains, while small producers and farmers mainly turn to traditional markets or, in some cases, even sell directly to intermediaries.

There are some interconnected problems that hinder the development of the Romanian fresh fruits and vegetables sector. Small semi-subsistence farms are often unable to access efficient collection and storage systems, resulting in an estimated only 20% of the total produce that reaches farmers' markets (USDA Foreign Agricultural Service, 2018). The rate of self-consumption is high, and also, tonnes of Romanian fruits and vegetables are thrown away, with farmers often citing the reasons that they do not have the capacity to sell them in season, there are no storage or processing facilities, and when they do manage to sell them, the price is too low. The traditional solutions for storing are challenged by climate change. There are only 30-

40 warehouses across the country, and the collection infrastructure for vegetables is sparse and it is able to receive a maximum of 10% of Romania's total vegetable production.

The COVID-19 crisis completely "changed the game". More and more people started to pay more attention to nutrition, appreciate local products more and be aware of their benefits. For example, 26% of Romanians participating in a survey in May 2020 said they were eating healthier. Online and on social media, food aggregation platforms have multiplied exponentially, delivering predominantly to big city areas. (Popa et al., 2021). However, most of the initiatives only focused on selling products, without improving essential parameters of local food ecosystems, without which they cannot develop: taxing businesses, educating small entrepreneurs in agriculture, exposing them to innovation and new green practices, obtaining certifications and ensuring product traceability, educating consumers for local consumption and building relationships between them and producers. Without these developments small farmers cannot capitalise in the long term on the exceptional growth circumstances generated by the pandemic emergency, as consumer behaviour has reverted to previous parameters, where large retail networks and physical markets are the main channels for purchasing agri-food products.

Still, some very good practices of SFSCs exist in Harghita and Neamt counties (e.g. guest houses serving local food, The Szekler Goodies from Gheorgheni, Honour Products in Izvoare, The Mineral Water Roads, The Salt Roads, The Szekler Fruits, Szekler Products /owned by Harghita County Council/). All these initiatives are registered at the National Sanitary Veterinary and Food Safety Authority. No structured and organised data is available about small scale farmers.

After their appearance, ASAT partnerships (Asociaţia pentru Susţinerea Agriculturii Ţărănești, the Romanian alternatives of CSA initiatives) became very popular near Timișoara and other regions. In 2013, the number of ASAT partnerships grew to 13 main ASATs (with weekly vegetable baskets), and more than 20 ASATs of other foods (milk and cheese, honey, eggs, meat, bread and cakes, jams, fresh fruit grown in traditional orchards, and forest fruit, etc.) However, according to the ASAT website (www.asatromania.ro) there is a decrease in their numbers: in 2017, only 8 active ASAT-partnerships operated in Romania, and no current data is available.

Since 2017 the Romanian-American Foundation (RAF) has supported 5 NGOs in creating and conducting 5 food hubs as pilot programmes, which offer a favourable alternative for the distribution and sale of goods produced by regional small-scale farmers and processors (www.foodhubs.ro). The aim is to support the competitiveness and development prospects of small- and medium-sized farmers through a complementary approach to cooperative association. These food hubs each have their own business model, but within common, programmatic parameters. The first years of implementation of the RAF pilot programme to set up and develop food hubs have demonstrated that this model of aggregation and marketing of local production, coupled with advisory services for farmers, is a viable one, with prospects for growth and scaling up nationally in the coming years in the context of appropriate support.

3.3.4. Common features and differences

Similar and different characteristics in the Czech Republic, Hungary and Romania are regarded through some selected indicators, namely farmers' markets, CSA initiatives and also, the trends experienced about label use. In general, the Czech Republic and Hungary appear to move along a similar pathway, while the Romanian case represents an alternative.

Farmers' markets play a key role in local food chains as an important meeting point for producers and consumers, improving the vitality and viability of cities. FMs are and will be subordinated to the economic principles of supply and demand.The most important thing for the survival and future development of FMs, as well as to maintain the current dense network of these markets, is the will and ability of the farmers to supply these markets with their products (Spilková and Perlín, 2013). Figure 2. shows the trends related to FMs in the focal countries. No aggregate data is available in Romania, where almost all administrative units (villages, municipalities, cities, county capitals) organise weekly markets, and in larger places, monthly fairs. These are independent markets licensed and supervised by the county and city councils, and there are no associations, chambers, or representative entities.

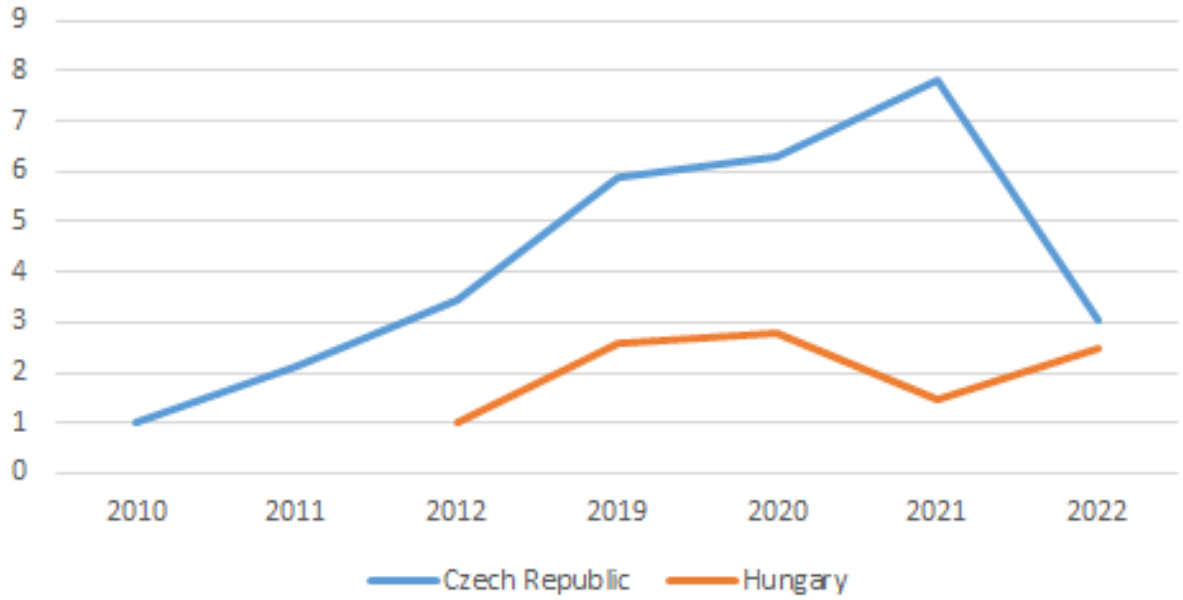

Figure 2: **Changes in the number of farmers' markets in the Czech Republic and Hungary**

Note: Changes are compared to the initial numbers: The first year (2010 in the Czech Republic, and 2012 in Hungary) is regarded as 1 (100%).

The development and function of FMs in CEE countries is different from that of markets in western Europe or in the USA, in many aspects. For example, due to the cooperation of non-governmental organisations and/or municipalities, organisation of FMs is typically, bottom-up, they are not initiated by farmers or other agricultural producers (Zagata and Boukalova, 2012). Perhaps this aspect results in either the fast growth rate presented in Figure 2, and also, in the fact that the development of FMs is mostly experienced in urban areas both in the Czech Republic and Hungary (Spilková and Perlín, 2013; Benedek et al., 2018).

Spilková et al (2013) found that after the collapse of the totalitarian regime a rapid spread of mass consumption was experienced, and people considered FMs as a unique shopping experience and they still claimed more hedonist than ethical or environmental motivations for their patronage, or participation in other types of AFNs. Similar trends can be experienced in Hungary (Kiss et al, 2020).

In Hungary FM shoppers are typically of higher social status (Lehota et al, 2019). Though there is a slight predominance of urban middle class shoppers at FMs, citizens of other social and economic status are also present, thus social exclusion is not typical in the Czech context (Spilková et al., 2013).

The product analysis of the FMs in Prague shows that the distance from their place of origin is as wide as from 1 to 838 km. Fresh fruits and vegetables and bakery products are the most local products. The more processed and special a product is, the more distant it is transported to the big city (Spilková andPerlín, 2013). The analysis of 149 Hungarian farmers showed that larger farm businesses transported their products further (or more often). In other words, economies of scale together with the lack of appropriate regulation resulted in the conflict of socio-economic goals (the desire of supporting small-scale farmers) and environmental targets (Benedek and Tabi, 2019).

Apparently the COVID-19 pandemics had a different impact on the FMs of the Czech Republic and Hungary. While many markets closed right after the outbreak of COVID in Hungary, their numbers stabilised close to the pre-COVID level by 2022. The number of FMs continued growing in 2020 and 2021, while a drop was experienced by 2022. Interestingly, the drop in the number of FMs coincides with the growth of CSA initiatives (see also Figure 2), which supports the results of the social media analysis presented in Chapter 2.7., regarding the rearrangement of local food distribution channels. Steady growth is experienced in the number of box schemes (in Hungary), or food hubs (Romania) (not shown in figures). To summarise, COVID apparently supported the development of channels that are either convenient (such as ICT-based ones), and/or are based on cooperation (such as consumer or producer clubs and cooperatives) (Benedek et al., 2021a, Benedek et al., 2021b). According to Bakos (2020) the basket consumers who prefer sustainable and conscious food consumption are best characterised by the type traits of postmodern ethical consumers with a hybrid lifestyle and form a homogeneous group according to their lifestyle traits and values rather than their demographic characteristics.

Figure 3 displays the trends experienced among CSA initiatives in the Czech Republic, Hungary and Romania.

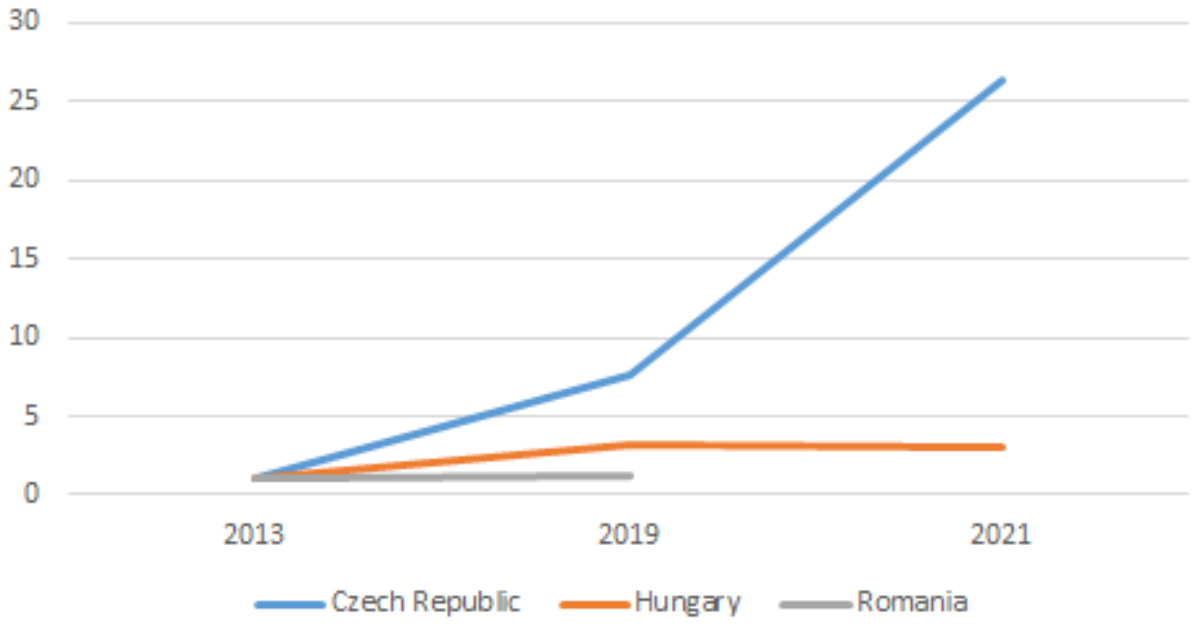

Figure 3: **Changes in the number of CSA initiatives in the focal countries**

Note: Changes are compared to the initial numbers. The number of CSA initiatives in 2013 is regarded as 1, (100%).

The decrease in the number of ASATs in Romania might be due to the formation of social media groups that allow a high number of consumers and producers to find each other easily (and informally). This process was strengthened by the outbreak of COVID. While COVID did

not change the remarkable growing trend in the Czech Republic, the number of CSAs did not increase after 2019 in Hungary, possibly due to the increase in the number of other short food marketing channels that require a smaller level of engagement from consumers (such as buying clubs).

In the Czech Republic and Hungary, similarly to the case of FMs, NGOs play an important role in the development of CSA initiatives (Asfourova et al., 2015). NGOs help in the distribution of the know-how (e.g. through the organisation of thematic workshops, publishing of guides), as well as to the connection of consumers to farmers. CSA farmers in CEE countries focus more on the local character: they place importance on providing healthy and nutritious local products to their community than CSA farmers from the USA. The education level of CEE farmers appears to be higher, and they more typically work in the CSA part-time than US farmers (Samoggia et al., 2019). These differences might be due to the fact that CSAs form a niche market in CEE, much more like in the US, all the involved actors are pioneers. Furthermore, the civic engagement is generally low in the CEE context, therefore, CSA farmers often spend extra time to bring together members of the local community, foster bonds and educate their consumer-members about sustainable diets and local food systems. CSA farmers were also found to use altruistic coping strategies and refrain from sharing the full range of costs, which is a notable difference from the Western situation (Balázs et al., 2016).

The major issue is scaling up both in the Czech Republic and Hungary (Zagata, 2012; Balázs et al., 2016).

Figure 4 shows the trends of local food certification schemes in the Czech Republic, Hungary and Romania.

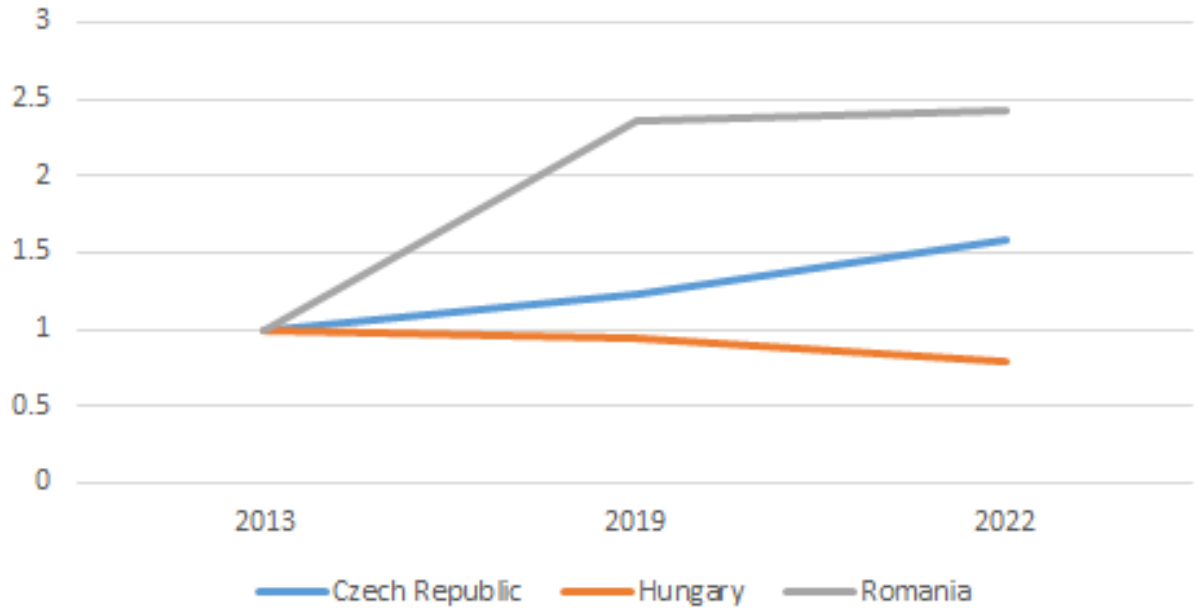

Figure 4: **Changes in the number of certification schemes in the focal countries**

Note: Changes are compared to the initial numbers. The number of certification schemes in 2013 is regarded as 1 (100%).

The Romanian Ministry of Agriculture and Rural Development launched a program in 2013 in order to enlist traditional and mountain Romanian products. Also, an application was developed to help marketing activities. (Although the program was originally meant to support small-scale farmers, in practice, many bigger enterprises registered their products.)

Regional food production is supported by strong marketing communications in the Czech Republic, which results in a constant increase in the number of certification schemes. By 2022, a high number of labels existed in the Czech market that signal the origin, quality, or organic character of the products (or a combination of these characteristics); their number has risen significantly over the last two decades (Chalupová et al., 2021). Regional food labelling may be an interesting marketing support for small- and medium-scale agricultural and food enterprises (e.g. local farmers) who have a limited budget for their marketing and business investment (Bryla, 2015). This general specific financial situation of those small Czech farmers has confirmed by the research of Řezbová et al. (2013). However, an inflation of labels is experienced as consumers do not really base their buying decisions on them (Velčovská and Hadro, 2018). In general, the success of such campaigns appear to depend on reaching affluent target groups (Chalupová et al 2019).

Following the accession to the EU, the government's measures in Hungary mainly deal with the collection and trademarking of traditional Hungarian foodstuffs (domestic and EU quality schemes), as the policy considers traditional products to be essentially the embodiment of local products. The regulations and support measures are based on the historical documentation of the production of the product (HÍR Program, 2018), the recording of the quality parameters (Codex Alimentarius Hungaricus) and the establishment of hygiene rules for the production of small quantities of food (MARD Decree 52/2010). The planned measures of the Rural Development Program for the period 2014-2020 also include local products in the legal framework for quality systems.

Meanwhile, rural development policy has introduced measures to help produce and sell products. At the same time, however, no measures have been developed and implemented to raise consumer awareness of local product commitment.

3.4. Consumer behaviour trends towards SFSC (local) foods

Short food supply chains often proved to be an important means of building up this embedded and secure image which is based on face-to-face interactions between consumers and producers (Leone et al., 2020). Motivations included from one side safety considerations: consumers increasingly would like to know where the food they buy came from. On the other hand, consumers are interested in the way how products are prepared (Kneafsey et al., 2013; Ben Hassen, El Bilali, & Allahyari, 2020). Due to the transparency in the food chain the role of trust will increase, however environmental (sustainable) and health issues can also led to higher demand. In a European H2020 project “Strength2Food” (Vittersø et al., 2019) summarised also that Consumers’ reasons for choosing SFSC products and their attitudes are manifold according to previous literature. Some studies emphasise that participation in SFSCs may increase the food awareness and culinary education of consumers (Torjusen et al., 2008) and eventually strengthen their cultural/regional identity (Galli & Brunori, 2013).

However, the consumer perspective is often neglected in studies on SFSCs, or just treated together with local products. This is because the foods offered in SFSCs are mainly local products. That is why it is not possible / worthwhile to make a clear distinction between customer attitudes and motivations.

One of them is the study of Giampietri et al., (2018) which explored the influence of the main determinants of consumer intention and behaviour, and provides useful information about the role of consumer trust. Comparing an extended model of the Theory of Planned Behaviour (TPB) with a classic TPB framework, also investigated the role of both consumer residential

areas in order to predict and explain SFSCs-related purchasing decisions. According to their results the extended model shows better Goodness-of-fit statistics, compared to the original TPB framework. All the investigated variables, including attitudes, subjective norms, perceived behavioural control and trust, reveal a positive effect on intention.

In the "Strength2Food" project (Vittersø et al., 2019) stated that in the prices set in SFSCs may also reflect a willingness to pay for high quality and special services by consumers. In addition to quality dimensions such as freshness and taste, products from these SFSCs are valued for credence qualities such as animal welfare, sustainability and sustenance of small-scale, diversified farms. In the customer survey among Norwegian, Italian, Britain, Hungarian, Polen and France respondents were asked to react to a stated claim that buying from this SFSC gives more value for money than in a regular grocery store.

There are limitations related to the development of SFSCs. Despite the increased consumer access and proper selling points, access is still a primary concern for SFSC producers. The main sale channels for SFSC producers are on-farm shops and farmers' markets. However, supermarkets and multinational retail chains (e.g., Coop, Lidl and Spar) would also like to tap into the sector and have made significant efforts to increase the availability of regional products in their shops through their own certification schemes (Aggestam, Fleiß, & Posch, 2017; Feldmann & Hamm, 2015).

According to the results of SMARTCHAIN project the majority of survey participants (85% in Germany, 67% in Spain, 70% in Greece and 70% in Hungary) also reported buying from SFSCs, at least sometimes, with "farmers' markets" being the most popular (pure) SFSC channel, especially Hungarian consumers share this opinion. However, just the minority of the Hungarian consumers know the innovative short food channels. The main reasons why consumers buy from SFSCs are that SFSCs give them the chance to support local producers and know where food comes from, as well as the naturalness of food from SFSCs. These results confirmed the findings from the qualitative studies, where consumers identified SFSC products as local food (attaching importance to the origin of the products) and perceived them as more natural. In contrast, high product prices, SFSC inaccessibility, and the lack of promotion turned out to be the chief reasons why consumers do not buy from SFSCs.

Because of the unusual circumstances caused by the COVID-19 pandemic during the time of the survey, participants were asked about changes in their mindset and behaviour regarding SFSCs. Notably, about half of all respondents agree that their SFSC awareness increased (from slightly to highly) as a result of the pandemic. Similarly, the COVID-19 situation seems to have positively affected the perception of SFSCs in all four countries. Almost 50% of the respondents reported an improved opinion for SFSCs.

The results of consumer surveys conducted in Hungary in the last 15 years (Szegedyné Fricz et al., 2013; Szakály et al., 2014; Szegedyné Fricz et al., 2015; Szegedyné Fricz et al., 2016) showed that respondents had incomplete product knowledge in terms of basic food safety and food quality. Purchasing decisions are based primarily on emotional and economic considerations. According to the results of a consumer survey in 2016, Hungarian consumers acquire their food-related knowledge primarily from family members (parents, grandparents). Based on the focus group analysis of the SmartChain project (2020) many consumers trust food sold by the supermarkets in the belief that the National Food Safety Office monitored these products. Food production and consumption habits are basically based on family traditions and customs. Additionally, educational institutions play an important role in acquiring consumer knowledge and shaping consumer awareness.

In a Pan European Study which covered 17 countries (among that Romania, Hungary and Czech Republic) researchers found that local consumption is gaining ground among Europeans.

The study shows that 90% of Romanians prefer local products, which they consider to be of higher quality than imported ones. They perceive local consumption as a reflection of their own values, believing that it can generate a positive impact in the community. 34% of Romanians believe that buying local products is an act of patriotism, 31% see it as an important goal to pursue in the future, and 30% believe that such an attitude is part of national pride (L'Observatoire Cetelem, 2019). Another (iZi data, 2020) survey conducted before the pandemic, showed that 19% of Romanians bought products from small local producers online. While the same survey questions three month later show different results: since the pandemic consumers increased preference for local products - 36% of the total sample said that they bought more often from local producers during the pandemic. Among the motivations of local produce hub customers is that they feel good because they are helping people who are doing a good job (68%), while 57% think local produce is superior to supermarket produce. However, Bruma et al. (2021) summarised that the COVID-19 crisis caused non-significant changes in the behaviour of dairy consumers in short food supply chains. But, at the level of future projections, there are intentions to change the buying behaviour in a positive sense. Food innovations are highly demanded in the country. For example, young people prefer "székely suchi", which is made of traditional local ingredients (andrice), but the appearance and the way of serving resembles the Japanese counterpart. These consumers are influenced by globalisation and the media; they are looking for products that are unknown in the local gastronomy, but could be produced with a little ingenuity. For example, "székely suchi" is made of fast-water trout.

Czech consumers have also moved their demand to food products with higher added value; they place more emphasis on perceived quality, longer durability and special product characteristics (Turčínková and Stávková, 2009). Highlighting the local origin of food products can be their competitive advantage (Šánová, Svobodová, & Laputková, 2017). In Czech Republic women prefer to buy regional products (regional products were analysed as a special small scale farmers' product from Vysočina Region) while younger than 25 old people tend not to pay attention to them (Chalupová et al., 2019).

3.5. Social Media Analysis

Based on the EigenVector Centrality, it is possible to identify the following ten hashtags (see Table 3) as significant across the network.

Table 3: **Identified hashtags**

Hashstag	Eigenvector Centrality	Hashstag	Eigenvector Centrality
#localfood	1.0	#organic	0.8501
#food	0.9622714538802934	#farmersmarket	0.8344
#local	0.9178029976666104	#fresh	0.7787
#foodie	0.9064509654120563	#delicious	0.7703
#eatlocal	0.9050882609731985	#foodporn	0.7604

In the area of specific food, honey (#honey), tomatoes (#tomatoes), craftbeer (#craftbeer) and wine (#wine) can be identified as the most frequent products in communication in connection with local food.

3.5.1. Trend analysis

These static values must be placed in the context of individual trends. As can be seen in the following graphs (see Figures 5, 6, 7) the ratio in the area of communication of the areas #eat-local, #supportlocal and #shoplocal is growing.

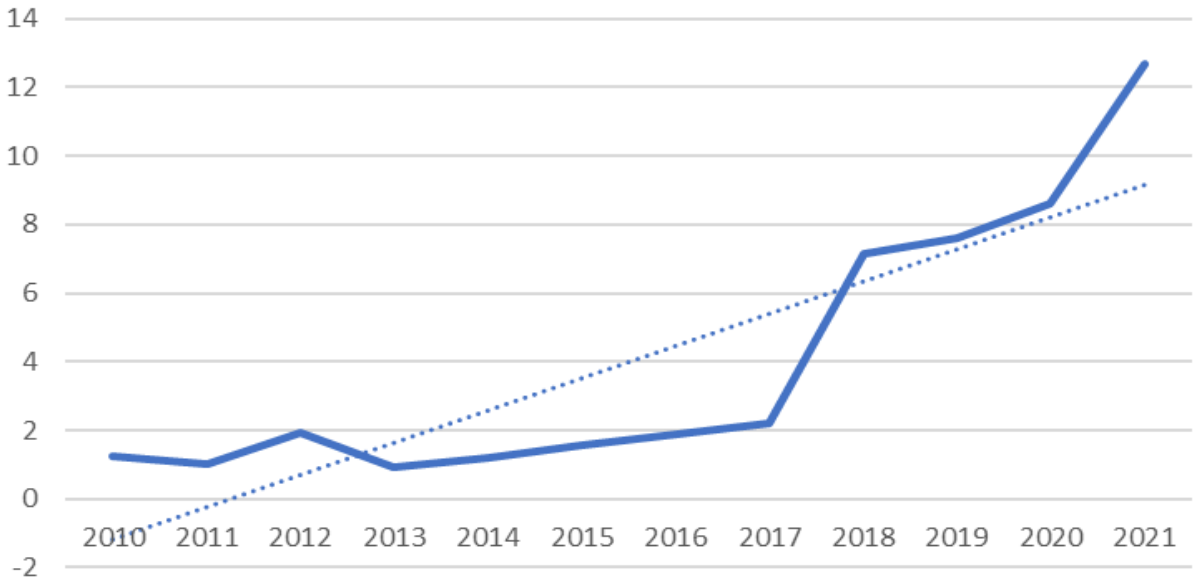

Figure 5: **Hashtag ratio #eatlocal in messages containing #localfood**

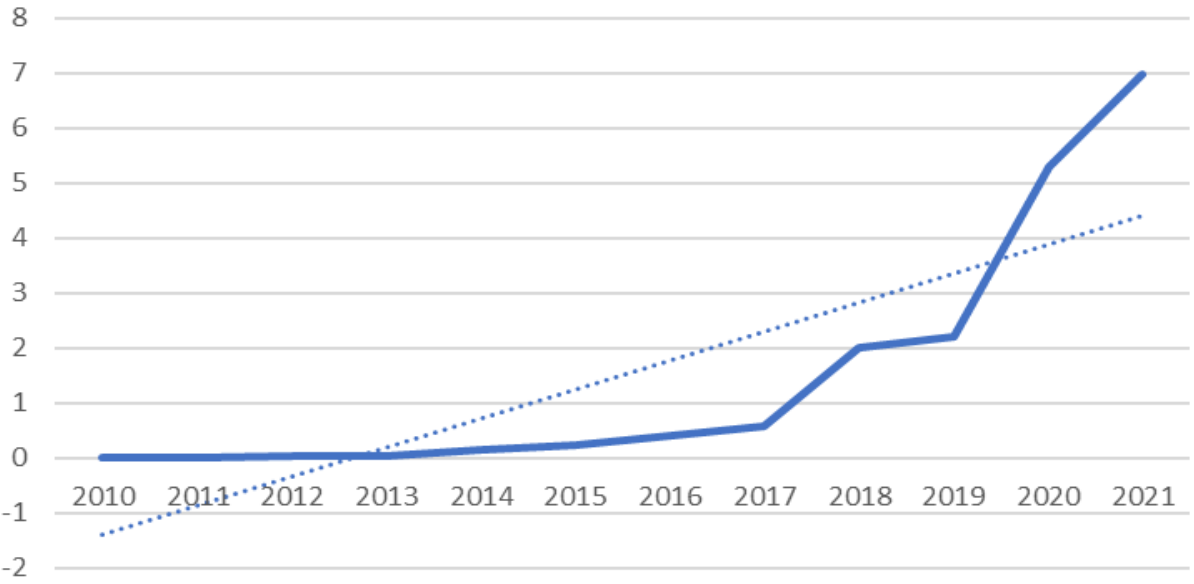

Figure 6: **Hashtag ratio #supportlocal in messages containing #localfood**

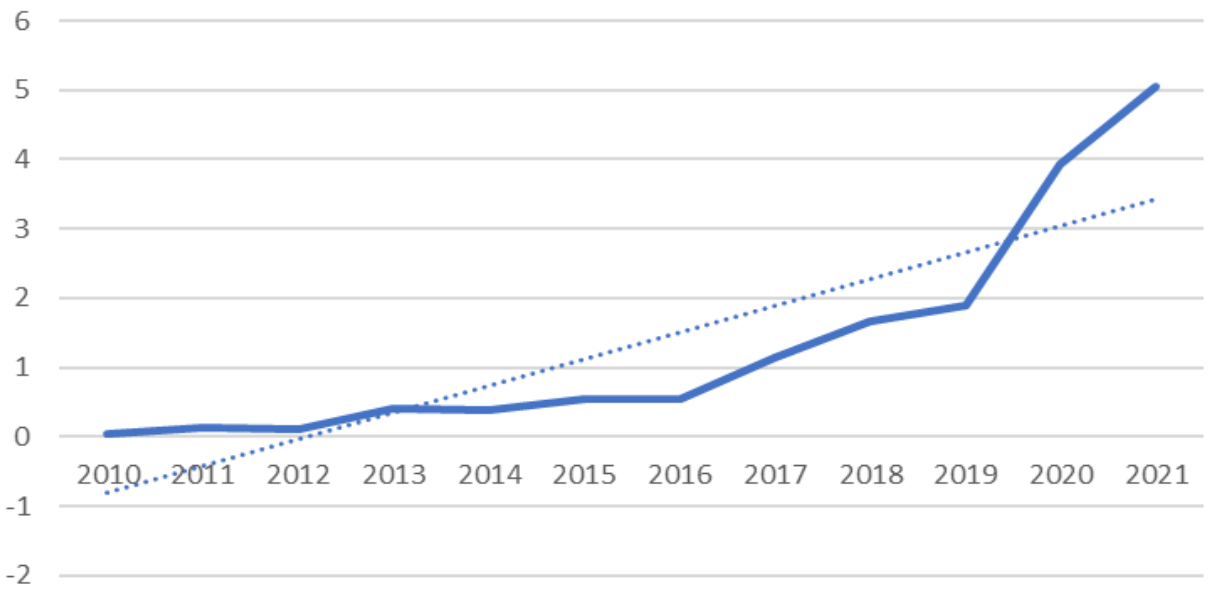

Figure 7: **Hashtag ratio #shoplocal in messages containing #localfood**

It is also important to mention the growing context of sustainability (#sustainability) and community (#community) (see Figure 8.).

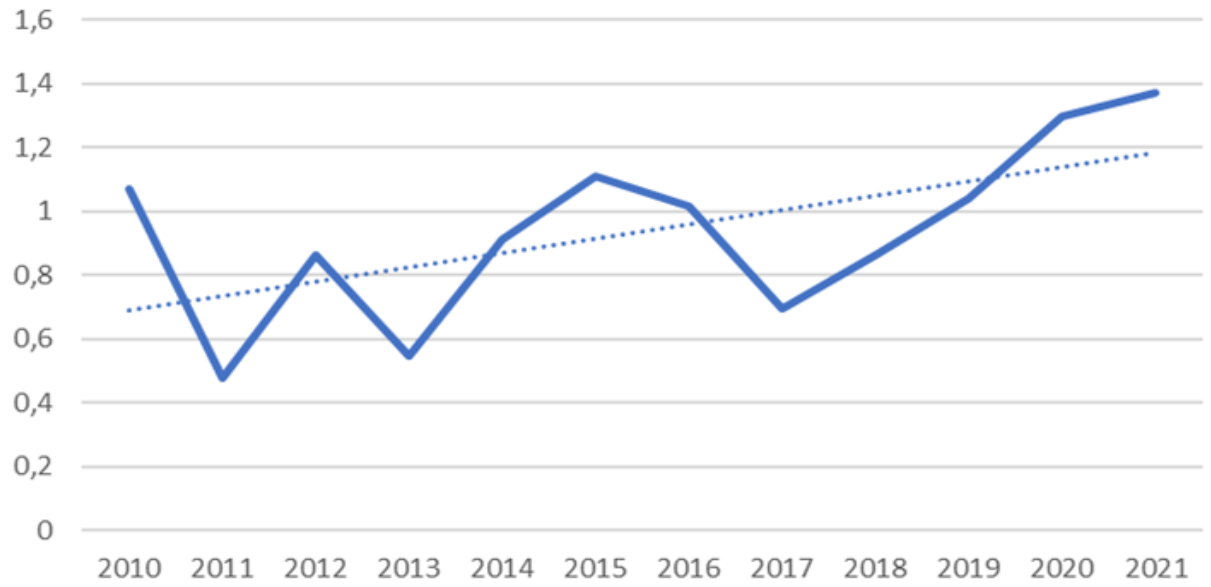

Figure 8: **Hashtag ratio #sustainability in messages containing #localfood**

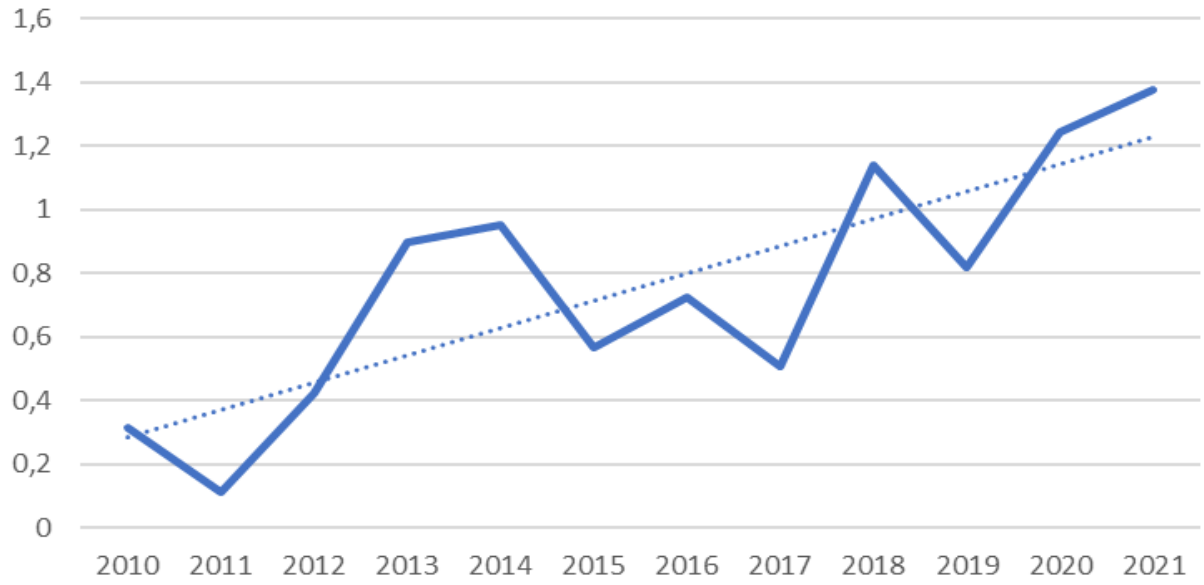

Figure 9: **Hashtag ratio #community in messages containing #localfood**

On the other hand, it is possible to identify the declining communication ratio of farmers' markets (#farmersmarket) and quantity (#quantity) see Figure 10, 11.

The declining hashtag #farmersmarket means that local food is no longer associated only with farmers' markets and people can buy local food products elsewhere. The importance of local food in restaurants is growing, resulting in a reduction in the incidence of this specific hashtag. As for the #quantity hashtag, content analysis of the related reports revealed that only a limited quantity was pointed out by sellers in 2011. Due to the growth of the local food sector, selling local food is not a unique thing any more, thus it is not communicated nowadays.

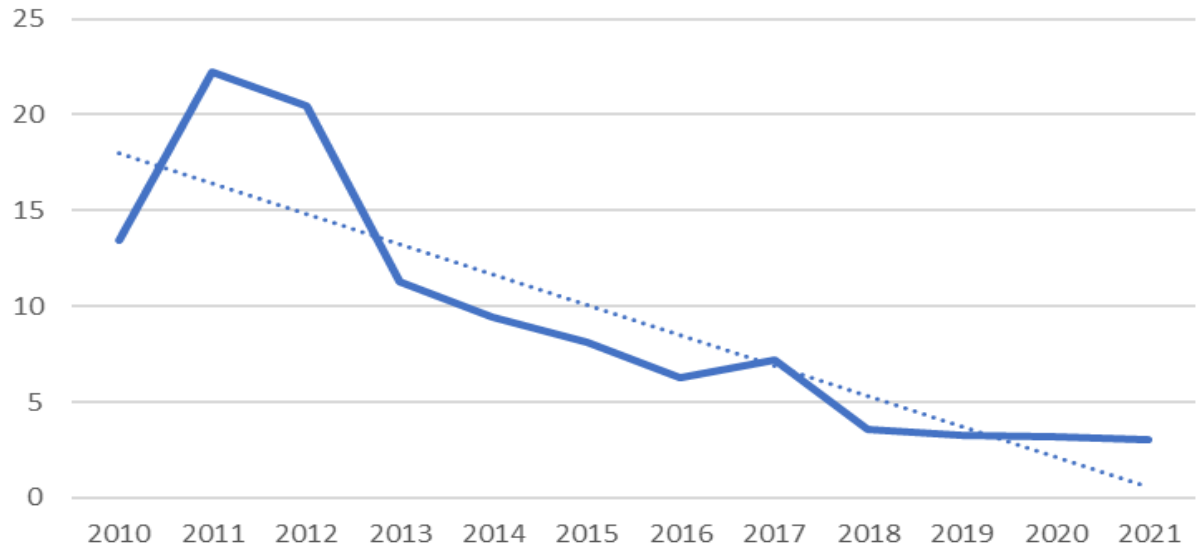

Figure 10: **Hashtag ratio #farmersmarket in messages containing #localfood**

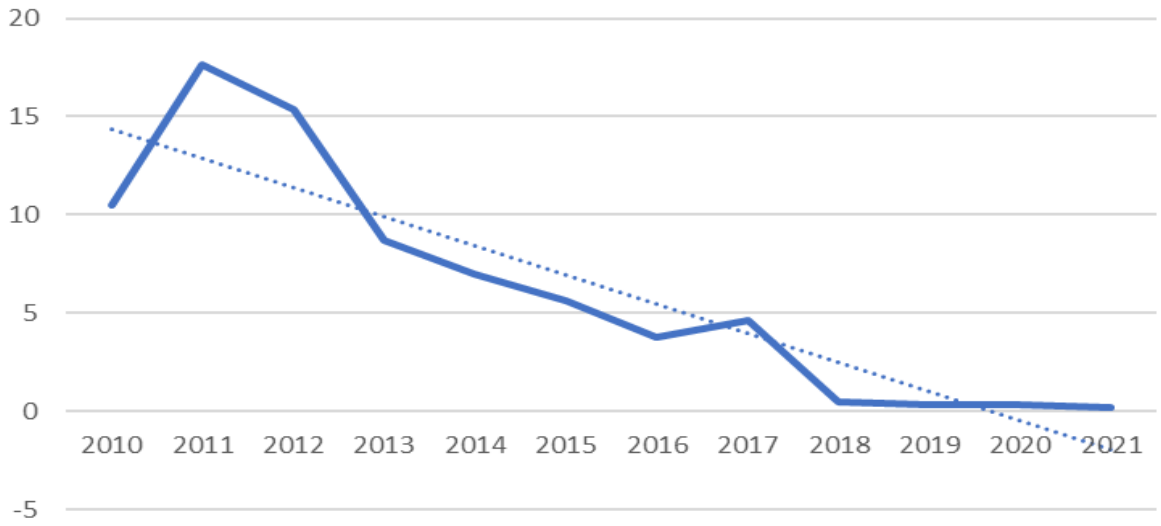

Figure 11: **Hashtag ratio #quantity in messages containing #localfood**

3.5.2. Community analysis

Based on community analysis, 5 communities were extracted. The value of modularity is equal to 0.17, which means that the individual communities are interconnected and not polarised communities.

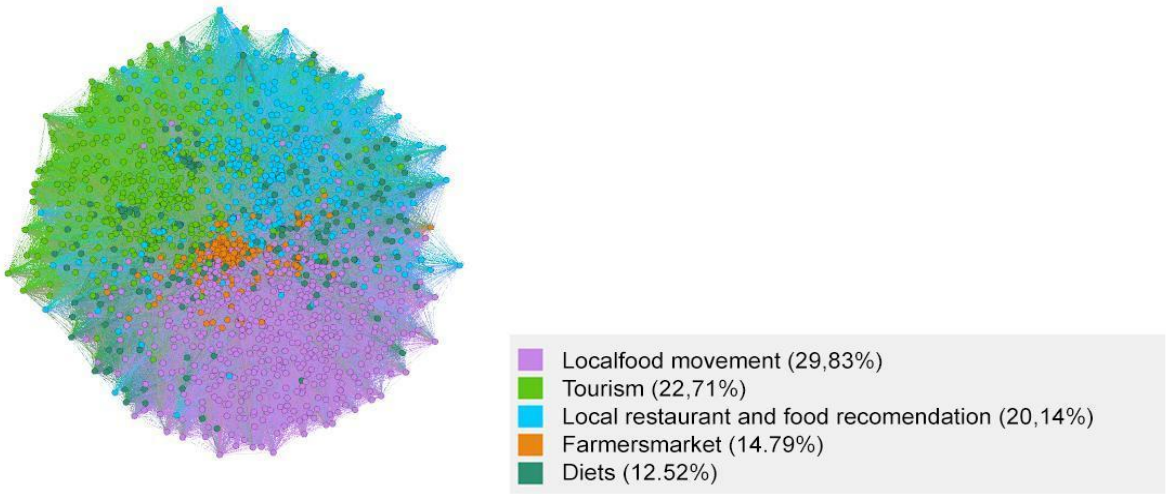

Figure 12: **Community analysis**

The largest community includes the 'Local food movement', which contains hashtags such as #community, #csa (community supported agriculture) see in purple in diagram 1. The second largest community, 'Tourism', is marked with green, which includes the communication of local products from tourists. This is a very important result, which means that local food is very popular with tourists. The third largest community is the 'Local restaurant and food recommendation' area (marked with light blue), which focuses on local products through promotion from local users. Another important finding is that the tourism community includes hahstag #lunch and the local community hashtag #dinner. Although declining, still a significant community is the 'Farmers' market' area (marked with brown), and subsequently the last of the 'Diets' community, which includes users who communicate food properties such as vegan, vegetarian and gluten free (marked with dark green).

This figure proves that local food consumption has a strong relationship with social movements and relationships, which may affect the choices of consumers.

3.6. Limitations of the characterization of the current situation and existing trends

The current study intended to examine the possible development path of local food system to justify our hypothesis that the local food system doesn't equivalent with the niche market anymore in BioEast countries, but we do not deal with the whole food system, because it is not the focus of the study. Thus, a paradigm shift is taking place in food supply chain. The food supply chain now has two pillars. In addition to the conventional (global) food chain, local food chains make up an increasing proportion of food systems. Local food system does not just have a food security role. It also plays an important role in the environmental, social, and economic sustainability of regions. The goals of a circular economy can only be achieved if a balance is struck between global and local food supply systems at regional, country and EU levels.

Consequently, the study committed to analyse the existing research with a particular focus on the geographical outcomes. Most of the limitations concern data availability, especially at larger scales. Data has been found to be not freely available in one or more countries; they are often "random" (e.g. collected by NGOs or non-statistical-focused institutions), and inconsistent, due to definitional problems (e.g. an overlap exists in the databases accounting for conventional and farmers' markets, etc.). Except for data provided by the Central Statistical Agencies, only current data are reported/shared, thus trend evaluation is challenging.

4. Conclusion

When food products are produced, processed and consumed within the region, the region itself benefits. This is the main message of the paradigm of the local food system. The industrialised agriculture and global food system developed successfully regarding the output of volumes of production and profitability but were detrimental to social and ecological values and did not succeed in bringing the food related challenges closer to a solution (Donkers, 2015). These dilemma and social distance from agriculture were recognized in Italy, France, Spain in the beginning of the new millenium and the re-localisation movements started to fleurish.

It was one of the first steps in the global diversification of the food chain, when the production of and demand for organic products increased to such an extent and became an independent policy within agricultural production and food supply. Detailed regulations for the production of organic food and a certification system for organic products have been developed.

A similar process takes place in local production systems. The essential difference is that a much wider range of producers and consumers are part of the new food supply system. Producer and consumer demand for the production of local products and local food systems has been growing steadily in recent decades. Increasing consumer demand for local products is progressively influenced by intermediate actors in short supply chains. Tourism, hospitality and catering are playing an important role in supplying consumers with local products.

As a result of these processes the European Economic and Social Committee (EESC, 2019) put on the table that 15 % of farmers sold half of their production through short supply chains, and four out of five European citizens considered that ‘strengthening the farmer’s role in the food chain’ was important. Short supply chains are gaining ground in the various countries of Europe, but not at the same rate.

Moreover the studied R&I projects (SKIN, SMARTCHAIN, Strength2Food, FOX, SALSA, RURALF) confirmed that there is a small phase delay for the countries that joined the EU after 2004, but similar processes are taking place as in the EU15. The key difference, as the EESC opinion points out, is that the share of short supply chains in the overall food supply chain varies from country to country. A common shortcoming of the studies examining the operation of short supply chains is that in the absence of reliable data it is possible to perform primarily qualitative analysis of food chains.

One of the original objectives of the recent study was to create alternative scenarios and trend analysis for the local food system with a special regard for BIOEAST countries. Nevertheless, unexpected issues emerged with respect to data reliability and data availability that prevented us from identifying trends on a comparative basis. Therefore, our focus was shifted towards the evaluation of existing indices in the light of the scenarios determined by the BIOEAST Foresight Exercise in order to provide suggestions about directions of data collection, and expected efficiency.

Based on the BIOEAST Foresight Scenarios and the expert panel exercise the paradigm shift has been started in the BIOEAST countries. Almost all the scenarios count with the local food system as the embedded part of the holistic food system. It also means that governance should accept its presence and focus on the channel approach to strengthen the position of small and family farms in CEE countries. The improvements of SME’s capacities rely not only on on-farm capabilities, but also on the general enabling economic and institutional environment, both on a regional, national and international level.

The indicator assessment highlighted that the number of organic farmers, the use of alternative channels and the relocalisation of conventional channels such as public catering have a significant effect on the alternative scenarios. It was also concluded that the key drivers of the relocalised, circular economy based scenarios are the number of farmers, number and quality of consumer-producer cooperative initiatives, number of alternative channels, and the consumers' perception of local foods. Furthermore, the results of the social media analysis pointed out that besides the initiatives of the local communities, agrotourism is a very important factor in the development of the local food systems.

It also must be acknowledged that not all the scenarios considered the LFS as a determining factor of the alternative future. In the case of scenario 2 (Linear Bioeconomy) the average knowledge level and preparedness of farmers will improve; however, their economic sustainability is sovereign from the development of LFSs. According to scenario 3 ("Business As Usual") no remarkable change in the relative importance of specific marketing channels is expected. Economic conditions will not let the development of the local food sector, the niche market character of local food remains.

To stimulate the LFS in the BIOEAST countries and to small-scale agriculture and food five recommendations are proposed for the Food systems Thematic SRIA:

Strategic Area 1 (PRODUCTION)

- Analysing and mapping on the knowledge of digitization and technology to improve the preparedness of farmers and other stakeholders of LFS;
- Analysing how the national AKIS may reinforce the knowledge flow of innovative environmentally friendly farming systems, organic production and agroecology;
- Aligning and analysing the applicability of cost effective, small farmer friendly tools, technologies, innovations in the field of bioeconomy to improve the compliance.

Strategic Area 2 (FOOD CHAINS)

- Proposing tailor-made, adaptable regulatory or control solutions, easy-to-use guidelines for decision maker based on the results and policy recommendations of R&D&I projects;
- Promoting special focus and tools on collaborative actions in the CEE countries where there is a strong deficit in trust, joint action both in horizontal and vertical collective actions by Future Horizon Europe calls;
- Observing how to enhance LFS focused advisory service, innovative brokerage for smaller actors implemented to AKIS plan.

Strategic Area 3 (RESEARCH)

- Mapping the available database which can supply reliable data and evidence based results for further decision making processes;
- Exploring the possibilities of the creation of a deeper dialogue with intermediaries who could be relevant stakeholders in data acquisition;
- Observing the possibility of data gathering by agricultural census (the value of the production (in € and UAA) which is sold via SFSC; number and size of farmers who buy via SFSC);
- Examining the opportunities in community based initiatives such as participatory guarantee systems.
- Involving players from the food chain to the researches related to the Farm to Fork Strategy

Strategic Area 4 (CONSUMERS)

- Conducting further representative studies on what consumers perceptions regarding local, organic foods and alternative food chains;
- Promoting social innovative initiatives by flexible eligibility and control criterias;
- Taking advantage of social media analysis as data source and platforms.

5. Recommendations

The study has brought forward very rich information on the status quo and plans for local food system movements in the CEE countries, especially in the observed member states. Considering the uniqueness and respecting the contexts in the different countries and regions, we recommend first of all to invite the BIOEAST members to present the results in a plenary meeting or by organising a separate meeting, dedicated to the future scenarios of the local food system. The aim would be to exchange experiences and plans among the members, to inspire each other and to co-design the future research area together. This will not in the least, lead to more understanding in the current and future food system and to enhance the sustainability of the stakeholders. It must be emphasised that the local food system is not clearly separable from the holistic food system; accordingly most of the recommendations may be perceived in a holistic way.

More specifically we recommend the BIOEAST TWG to focus in the Food systems thematic SRIA on:

Strategic Area 1: Sustainable Food Production (PRODUCTION)

The knowledge of digitization and technology, new trends and channels should be made available to local food system actors by establishing a rural facilitator network or knowledge hubs. From the study results we learned that there are many tools and platforms already for stakeholders of LFS. Interoperability and interconnectivity are still lagging. There should be further analysis and mapping in the countries and regions, which tools address which specific topics and provide which kind of information and how adjacent tools and platforms could be better connected. User-friendliness and facilitation should be the central aim.

More studies pointed out that especially the small farmers and producers of the LFS are open to using innovative environmentally friendly farming systems, local food production has a strong linkage to organic production and agroecology. However the availability of the trends, new technologies is hardly accessible for these farmers. Thus, further analysis is needed on how the national AKIS may reinforce the knowledge flow according to the regional farming systems and their needs. Particularly interesting is the application of cost effective tools for reducing biomass loss and waste which require a special focus from researchers and experts to be able to provide relevant information and to adapt new technologies for smaller actors of the system such as small scale manure management, sustainable using of by-products, food logistics, mobile and common food processing technologies etc. That is why mapping and analysing the applicability of cost effective, small farmer friendly tools is suggested. It is important to highlight that these observations should be noted how these small farming technologies could be implemented in the BIOEast region as the national authority has limited knowledge in these innovative solutions.

Strategic Area 2: Power and information in the food system: strengthen the food environments and vulnerable actors in the food chains (FOOD CHAINS)

Channels are changing which demand prepared and innovative farmers and organisers to provide an attractive offer of local food and joint services. The biggest hindering factor of the innovative solutions are the regulatory gaps and lack of capacities, competencies of small farmers. In the BIOEAST countries there is no additional capacity of the authorities to mentor the local initiatives that is why R&D&I projects shall propose tailor-made, adaptable regulatory or control solutions for decision makers. Further projects shall elaborate those easy-to-use

guidelines which provide relevant and practical information for policy makers in BIOEAST countries to be able to articulate innovative legislative frameworks.

It would be expressly useful to observe how the already accepted and working trading and tax regulations would be adaptable such as the Italian “0 kilometres law”, the French EGALIM law which allow the preference of local products in the short chains. In order to reinforce the implementation of innovative short food chains which have the capacity to buy higher quantities from farmers such as public catering, not just the legislative framework should be undiscriminating but the society must change. Thus, informal cooperation models between farmers, collaboration models for consumers, farmers and intermediaries (like food hub managers, facilitators, chefs) shall be analysed and adapted according to the regional circumstances to create awareness of innovative solutions. The results of BOND (RUR-CSA) project evidenced the benefits of working together with others, i.e., other farmers and organisations within the home country but also from other countries, strengthens the motion of collaboration, therefore the future Horizon Europe calls should have a special focus on collaborative actions in the CEE countries where there is a strong deficit in trust, joint action both in horizontal and vertical collective actions.

A single small-scale producer must be able to cover all the departments of a large food processor (production, material procurement (by-products, raw materials, packaging), HR, marketing, sales logistics, veterinary requirements, food safety, environmental requirements, waste management, storage, preservation, labelling, market research, food trends). Therefore it is highly recommended to enhance LFS focused advisory service for smaller actors implemented to AKIS plan.

For this issue the HORIZON-CL6-2021-GOVERNANCE-01-27: Developing EU advisory networks on consumer-producer chains call aims to elaborate more tailored made tool boxes based on different requirements of regions.

Strategic Area 3: Research, innovation, technology and investments for future sustainable food systems (RESEARCH)

Data is often collected about the LFS initiatives by NGOs or non-statistical-focused institutions, or even enthusiastic individuals, lowering data reliability. In the era of digitalisation it would be important to map the available database which can supply reliable data and evidence based results for further decision making processes. In France, Italy the agricultural census goes into details of the already using supply chains and the sold values in the different channels. Based on the example of the US and French census it would be recommended to gather data in the official agricultural census to follow up the structural changes in LFS. In these census the collected data: the value of the production (in € and UAA) which is sold via SFSC; number and size of farmers who buy via SFSC.

In the BIOEAST countries it is suggested to explore the possibilities of the creation of a deeper dialogue with intermediaries who could be relevant stakeholders in data acquisition. These actors might be ‘digitally wise’ advisors and innovation brokers who facilitate and innovate farming by transforming the farmer’s business in more digitally oriented farming.

Regional food labelling may be an interesting marketing support for small- and medium-scale agricultural and food enterprises (e.g. local farmers) who have a limited budget for their marketing and business investment. That is why it is recommended to study how the community based marketing, community ensured quality management, Participatory Guarantee Systems may be adapted to the BIOEAST value chain's development.

It was recognized that many R&D&I projects aim to elaborate new measures, technologies where local authorities are involved to ensure their applicability (e.g.: mobile slaughterhouse project in Austria, common processing point in France). In spite of the acceptance of local authority the adaptation is not automatic into the practice of other countries.

It is important to involve actors in the food chain in research based on the Farm to fork approach. Thus, for example, preschoolers already need to understand how the chain works, and producers also need to understand their motivations. It can be also stated that aim of research activity is not only data collection but use and promotion of empirical results. It is very important to make.

Strategic Area 4: Promoting sustainable food consumption and the shift to healthy, sustainable diets (CONSUMERS)

Based on the studied consumer behaviour results, further awareness raising actions are required to involve consumers into LFSs in the region. The studies also revealed that there are significant differences between the consumers' perceptions according to the regional customs. Moreover, there are meaningful differences between the purchasers of BIOEAST countries as food production and consumption habits are basically based on family traditions, customs, and educational background. Further research is needed to understand the motivations and attitudes of consumers. Furthermore, beside traditional local products, there is a need for food innovations: health-protective and convenience products are highly demanded. Their price acceptance is expected be higher.

It is important to promote local products in each consumer segment. For example younger people are interested in innovations such as “székely suchi”. These kinds of product developments in LFS require further cooperation between the actors of the local food systems however the specialised subventions for these kinds of social innovation are rarely available. On one hand these kinds of social innovation initiatives mean difficulties for national authorities to handle it, on the other hand innovative brokerage is needed to facilitate common brainstorming and actions. In order to create supporting circumstances and programs (such as EIP AGRI) for social innovative solutions more flexible eligibility criteria are needed. Cooperations between farmers, food producers (e.g.: bakers, butchers) woodworkers, craftsmen, food hubs and many different types of LFS actors require flexible regulatory and supporting framework.

Finally, our studies aimed to point out the importance of social media as a data gathering source and as a platform and networking area of the informal SFSC initiatives. In social and future studies several research fields are founded where social media analysis, data mining is an accepted methodology for scientific research. Moreover, the methodology is relevant in social research and the results are reliable as people answer what they really think. Hence it is recommended to pay more attention to social media analysis and to apply the existing platforms, networks for LFS development. Additionally, there is a need for public-private cooperation in developing digital tools, platforms and strategies for enhancing knowledge flows, since it is the business model of companies to develop end-user/customer relations.

6. Annex

6.1. List of Annexes

Annex 1: **Descriptive statistics of the expert panel**

Gender	Male	1
	Female	6
	Sum	7
Area of work experience	Researcher	4
	Food chain actor	1
	Representative of a non-governmental organisation	2
	Sum	7
Work experience	5-10 years	2
	10-20 years	3
	> 20 years	2
	Sum	7
Farming experience	Yes	3
	No	4
	Sum	7

Annex 2: **The detailed description of the indices identified in section 3.1.4.**

- Number of organic farmers. LFSs and organic food production are closely intertwined. First, they share some important features, such as environmentally beneficial production methods that promote local agro-biodiversity or the intention to reduce the impact of transportation and logistics by selling as locally as possible, etc. Many organic farmers utilise SFSCs (usually organic markets, farmers' markets, CSA initiatives and vegetable box delivery schemes) to distribute their produce. Evidence shows that many local farmers adopt organic techniques (usually without certification) to satisfy the complex demand of their customers (Higgins, Dibden, & Cocklin, 2008).
- Number of local food producers advertising in the online local food directory. The number of directories that list local farmers is increasing. These lists are mostly created and maintained by local non-governmental organisations (NGOs) being involved in rural development. Directories with countrywide relevance are much sparse. The introduction of GDPR resulted in the loss of some functioning directories that had been established before the changes in legislation.
- Number of small-scale producers. Among local food producers, small family enterprises and also individual producers can be differentiated; however, data are available only for the latter: 'small-scale producers' is a taxation category involving individuals only; this could be used as a proxy for the number of all local food producers. Small-scale producers are the most likely to use direct marketing channels, because instead of competing on the global market they aim to capture more added value and increase their profit through SFSCs.
- Number of certification schemes. Certification schemes are used to differentiate local products from their conventionally produced equivalents based on the place of production. Though some authors consider the use of such certificates as a proof that a product has not integrated in the local socio-economic environment (Watts et al., 2005), other studies

suggest that consumers are willing to buy certified products, due to defensive localism (Winter, 2003) and ethnocentric buying behaviour (Chambers et al., 2007). The number of such schemes shows the engagement of farmers towards regionalism. More importantly, it shows the level of activity of intermediaries that have a crucial role in facilitating LFS development (Balázs, 2012). Thus, the number of certification schemes indicates the current level of activity.

- Number of farms producing food for sale. This indicator shows the number of farmers' owned farms (i.e. that are managed by individuals, not corporations) that use agricultural area and produce food for sale. This way farms that are entirely or partially involved in food self-provisioning can be excluded.
- Number of specific SFSCs. The definition of farmers' markets, as well as that of CSA initiatives and food hubs vary according to the local regulations. Furthermore, there might exist some contexts where the differentiation between "new" and traditional forms of specific SFSCs might be challenging in practice (Benedek et al., 2018).

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