

The socio-economic force field of the creation of short food supply chains in Europe

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Summary

It is a clear contradiction that while, on a verbal level, there is a mushrooming of declarations on the importance of a specific form of circular economy and short supply chains in sustainable rural development, these systems hardly exist in the new member states of the European Union (EU). The current article offers a possible explanation for this paradox and suggests some policy measures to enhance the role of these systems. Applying the approach of institutional economics and force field theory, and based on expert estimations from ten EU member states using the MACTOR method, the authors determined the influence-dependence relations between relevant actors and the actor-goal connections in the socio-economic systems relevant to short supply chains in EU member states. It was proven that in the new member states of the EU the considerable cost-efficiency advantages of global supply chains paired with the high level of influence of multinational trading companies are, in most cases, more important factors than sustainable development. The relatively low propensity to pay for local products on the part of the population of new EU member states further decreases possibilities for short supply chain development. The concluding remarks also include suggestions for policy makers.

Keywords

circular economy; food production; institutional economics; MACTOR method; strategic analysis

According to JURGILEVICH [1], the “circular economy regarding the food system implies reducing the amount of waste generated in the food system, the reuse of food, utilization of byproducts and food waste, and nutrient recycling. The measures must be implemented both at the producer and consumer levels, and finally in the food waste and surplus management”. The short food supply chain (SFSC) concept should be considered a particular realization of the circular economy philosophy in the agro-food sector [2]. According to the definition of Regulation (EU) No. 1305/2013 [3], a short supply chain is a supply chain involving a limited number of economic operators, committed to cooperation, local economic develop-

ment, and close geographical and social relations between producers, processors and consumers. It is worth noting that, rather unusually in legal texts, the definition highlights the importance of social relationship between economic entities in the food chain. In this regulation, European Union (EU) has declared that “member states should be able to include in their rural development programmes thematic sub-programmes... (which) should concern, among others... short supply chains...” [3]. Obviously, SFSC is a priority of EU but there are considerable differences among member states from the point of view of the development of SFSC systems [4]. The goal of the current paper is to analyse the causes of these contradictions.

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In the last 50 years, the international trade in food and agricultural products has been increasing at an exponential rate, faster than production itself. This process has been fueled by numerous, interweaving processes, including the emerging importance of international companies [5], trade liberalization [6, 7] and the increasing use of comparative advantages [8]. The current agro-food trade system can be characterized as an extremely complex [9, 10], dynamic [11] web of interactions [12, 13].

The development of short supply chains has attracted considerable attention in the last few decades [14–16] because it is supposed, by a large number of experts [17, 18], opinion leaders [19] and political decision-makers [4], that globalized food trade networks can be characterized by a high level of vulnerability [20, 21], a lack of transparency [22–24] and that they imply a high level of environmental burden [25, 26]. Nevertheless, there are considerable debates on the environmental effect of long supply chains [27–29] and locally produced and consumed products can be seen as an alternative to over-centralized food supply systems [30, 31], which are often based on under-payment of agricultural producers or the abuse of under-priced natural resources [32, 33].

On the other hand, although the sine qua non definition of a short supply chain is the low number of intermediaries, different sources are rather obscure concerning the exact number of these intermediaries. MARSDEN et al. [34] do not offer an upper limit for these organizations [35], describing the number of these organizations as “minimal” or “ideally nil”. CHIFFOLEAU [36] offers a relatively simple categorization of short supply chains:

I. Direct selling:

1. Individual

- a. local trade shows and exhibitions,
- b. selling on the farm,
- c. local markets,
- d. shopping basket packages.

2. Selling via a collective of producers and consumers (Community Supported Agriculture).

3. Associations of agricultural producers

- a. local trade shows and exhibitions,
- b. farmers’ markets,
- c. market basket, consisting of products of agricultural producers,
- d. joint selling point.

II. Short supply chain selling by market middlemen or in the absence of producers at the selling point:

1. Collective

- a. depot or re-seller,

- b. intermediary of the collective of producers,

- c. selling via producers’ cooperatives,

- d. selling to the hotel, restaurant, café (HORECA) sector

2. Individual

- a. via Internet,

- b. to the HORECA sector,

- c. selling to retailers.

The study is structured as follows: the introduction section reviews the current development of food supply chains in general and SFSCs in particular, followed by a description of the relationship between the short supply chain and the circular economy concept. The material and methods section presents the method actors, objectives and force reports (MACTOR) method applied to an analysis of the position of different actors, as well as their strategies and the procedure used to collect expert opinion. The results and discussion section of the paper summarizes the most important results of this study by highlighting the characteristic differences between the member states of the European Union, both the old (generally more developed) members and the new (generally less developed) members. The conclusions section highlights the most important ways to achieve development, focusing on the potential role of economic policy at EU and national levels.

MATERIALS AND METHODS

As has been shown in the introduction section, the socio-economic force field is a decisive factor in the formation and development of SFSCs. The metaphor “socio-economic force field” is widely applied in the description and analysis of the interplay of different social actors [37, 38]. In order to understand the current situation and future development trajectories of SFSCs, as well as to determine the possibilities of the further development of regulatory policy, we have to understand the inherent structure of the interplay of different forces.

The key concept of the model is that actors may influence other actors in terms of their potential to apply pressure on other actors directly or indirectly, in order to affect their behaviour. The validity of this concept is well documented in previous and current literature [39, 40].

The ultimate aim of our research was

1. to determine the basic stakeholders from the point of view of circular economy development,

2. to establish the set of strategies of different stakeholders, concerning SFSCs,
3. to find possible coalitions between stakeholders interested in the practical promotion of the SFSC concept based on the systems of interest.

Selection of model

Based on the typology of social games developed by VAN BENTHEM [41], the further goal of this research was an analysis of a dynamic epistemic-logical social game. In order to achieve this goal, we searched for a methodology which offers a relatively straightforward, easily understandable, interpretable and quantifiable description of actors' mutual positions as well as actor-goal relations, as opposed to a simple verbal description. This should be a method that is flexible and does not require the application of mathematical models containing speculative presuppositions.

There are only a few models and methods in the literature for the analysis of social forces [42], such as games, e.g. dynamic network analysis (DANA) [43], the Allas model [44] and the multi-issue actor strategy analysis model (MASAM) by BENDAHAN et al. [45], but these are not supported by a wide-ranging experience of application and references. After due consideration, we chose the MACTOR method of GODET [46] because this well-tested method has been widely used for the analysis of complex socio-economic problems [47].

This analysis is based on three basic pillars: the institutional economics approach, the concept of strategic planning [48–50] and principle-agent theory [51]. In the opinion of GODET [52], the so-called “French school of strategy (école française de stratégie)” considers the different social systems as a multi-actor game, in which different groups of participants (the actors) are present,

and take part with the goal of making their specific interests prevail. This approach has been widely applied in different fields of the analysis of social choices and decision-making processes [53, 54].

The effect of the influence of one actor (A) on another (B) can be expressed as a sum of the direct and indirect influences of actor A on actor B. The algorithm calculates the influence-dependence relations between different actors on the basis of their direct and independent mutual influences. In the next step, the goals of different actors are evaluated, taking into consideration the mobilizing force of actors. The results of the analysis were evaluated and visualized by correspondence analysis. This multivariate method is appropriate for visualizing the relations between actors and goals [55].

Protocol of interview

In the first step of our investigation, face-to-face unstructured expert interviews were conducted to determine the potential actors and their sets of goals. The platform used for this process was the Tech.food project [56]. The goal of data collection was to gather expert-estimations on the relative power (influence) of different actors and the attitude of actors towards different strategic aims. The estimation of the intensity of actor-actor as well as actor-goal relationships was made in the framework of expert interviews. The protocol of the interviews is presented in Tab. 1. We considered the researchers who had taken part in different European debates on the place and role of short supply chains to be experts. The interviews were conducted between 2012 and 2017 in the framework of the two largest professional exhibitions of the European food industry: Salon International de l'Alimentation (SIAL, Paris, France, held in 2010, 2012 and 2016), and Allgemeine Nahrungsmittelausstellung (ANUGA, Cologne, Germany, held in 2009) as well as at the Food Industrial Expo in Budapest (Foodapest, Budapest, Hungary; held in 2015) and in the South-Eastern Europe Transnational Cooperation Programme (Tech_food, 2009–2012).

Selection of participants

We applied multiple criteria in the process of selecting the participants in our research. These were as follows:

1. Informed consent. The rejection rate in the interviews was rather low: just 15 potential respondents declined to participate. We asked the reasons for declining. Four of them stated that they do not consider themselves competent in these problems, while five said that their

Tab. 1. Protocol of interview with experts.

<p>Researcher: You certainly agree with us that the level of development of short food supply chains (SFSCs) in your country is a result of different stakeholders. In our previous studies we have collected the most important ones. Please, evaluate the direct possibility of the influence of one stakeholder on another by filling out the table, on a 0–4 scale.</p> <p>The order of pairs have been determined by the random-number generator of Excel. To avoid any systematic error the order of pairs has been re-grouped after each ten interviews.</p>
<p>Researcher: We have collected a set of goals, which can be important to at least one actor (stakeholder). In the following table, please evaluate the position (attitude) of the different actors towards the different goals on a –4... 0... +4 scale.</p>

participation in the interview would be in conflict with their position (two of them were managers of international food trade companies, one was a manager of an international retail trade firm, two other participants were middle-level public servants in governmental administration). Finally, six respondents declined to co-operate due to a lack of time. All of the interviews were conducted on a strictly anonymous basis.

2. Competence. We invited specialists to the interviews

- a. who based on their experience and/or position had a fairly holistic view of processes in the food chain, and
- b. who were considered by their immediate social environment to be experts.

All of the respondents were, informally, evaluated by at least two researchers (in practice by participants in the current study) based on the competences they demonstrated in various discussions on different aspects of SFSC.

3. A holistic approach. In the process of selecting interview partners we preferred specialists who, based on their experience and/or position in the local food chain, were able to contribute

to a general picture of the relations in SFSC, not just to consider one part of the food chain.

From the point of view of the geographical distribution of respondents, among the interview partners were the representatives of founding member states of EU (France, Italy), respondents from an old member state which joined EU later (Austria) and respondents of new member states (Romania, Hungary). The countries of affiliation of respondents well reflected the diversity in economic development of EU with regard to the average gross domestic product per capita measured in purchasing power parity. This indicator is, for example, 128% in Austria and 58% in Romania [57]. The geographical structure of the distribution of respondents did not represent EU as a whole because the analysis focused on southern member states, reflecting the fact that regional products are mainly produced in Southern and Eastern member states of EU.

The most important socio-economic indicators of the respondents are summarized in Tab. 2. It should be emphasised that, with this type of analysis, we cannot follow the well-established logic of survey-type opinion research methods because

1. representativeness as a basic postulate of this

Tab. 2. Basic characteristics of the respondents enrolled in the study.

	HU	RO	SL	HR	IT	AU	FR	PT	EE	SK
Gender										
Women	4	4	2	4	6	2	6	2	2	4
Men	8	8	1	2	4	0	6	1	4	6
Type of qualification										
Agriculture	6	1	1	4	2	2	6	1	0	4
Other natural science (e.g. chemistry, biochemistry)	2	2	0	0	1	0	1	2	2	4
Engineering	0	6	1	1	4	0	1	0	0	2
Economics	4	2	1	1	2	0	1	0	4	0
Social sciences (e.g. political science, law)	0	1	0	0	0	0	3	0	0	0
Professional background										
Higher education	8	6	1	2	4	1	0	0	0	4
Scientific research	4	1	1	2	2	0	6	3	0	2
Agricultural production	0	2	1	0	0	1	0	0	0	2
Food trade	2	2	0	0	0	0	3	0	6	0
Policy analysis, legislation, politics	1	4	0	0	4	2	0	0	0	2
Professional experience after graduation										
0–5 years	5	3	0	0	4	2	5	2	2	4
5–20 years	3	6	1	4	4	0	4	1	4	4
> 20 years	4	3	2	2	2	0	3	0	0	2

HU – Hungary, RO – Romania, SL – Slovenia, HR – Croatia, IT – Italy, AU – Austria, FR – France, PT – Portugal, EE – Estonia, SK – Slovakia.

type of research is not applicable since it is impossible to define the “population”, and
2. the length of the interviews does not allow us to have a high enough number of respondents to carry out a statistical analysis of the results.

At the same time, this research concept seemed to be useful for the analysis of the actors involved in SFSC, as well as their goals and what is at stake regarding the potential benefits of current SFSCs. Notwithstanding the limitations, we tried to establish a relatively well-balanced sample of respondents focusing on gender equality, diversity of qualification and professional background.

The literature definitely supports the application of relatively small sample sizes (in a number of cases this means fewer than 30) because this method can be considered a semi-quantitative one, which focuses on the quality of the respondents and their opinions.

With the design of the panel of respondents, our aim was not to achieve representativeness because, as a consequence of the wide and diverse sets of stakeholders, this would be impossible. The high proportion of experts working in higher education and academic research offered a favourable opportunity to obtain information from experts with a broad overview and a perspective on the area analyzed.

RESULTS AND DISCUSSION

In the first step, we determined the set of relevant actors and their goals. It is important to highlight that these sets were the same for both groups of countries. In the case of some interviews with experts from old EU member states, it was mentioned that the consumer protection organizations should be taken into consideration as separate actors. However, finally it was decided that these consumer protection organizations are specific forms of the expression of the will of their members. The list of actors and their strategic goals are presented in Tab. 3.

Altogether 10 actors and 6 goals were identified. Arguably, their number could be increased, but this would jeopardise the operability of the research. At the beginning of our investigation it became clear that there are considerable differences between the situation in the old member states of the European Union (OMSEU) and the new member states (NMSEU) joining EU in or after 2004. In this way, we created two different groups of EU member states.

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Tab. 3. Relevant actors and their strategic goals in the establishment of the short food supply chain.

	Abbreviation
Actors	
National governments	GOV
Local governments	MUNICIP
Consumers	CONS
Agricultural producers	AGRPR
Rural population	RURALPOP
Multinational food processing companies	MULTIPROC
Multinational food trade companies	MULTITRADE
Local food processors	LOCALPROC
Local food traders	LOCALTRADE
European Union	EU
Goals	
Sustainable development	SUSTDEV
Rural development	RURDEV
Food safety	FOODSAF
Increasing product choice	PRODCH
Cheap food	CHEAP
Cost cutting by building up global food supply chains	LOGI

actors on each other are summarized in Tab. 4. The influencing actor was given in the corresponding row, the influenced in the column. The attitudes of the different actors towards the goals were relatively similar in both groups of member states. Tab. 5 shows these relations between the actors for NMSEU. To save space, the actor-actor relations for OMSEU are not presented in the separate table because the only difference was that in OMSEU the low price of food (CHEAP) received much lower values from different actors.

The influence-dependence matrices determined on the basis of direct and indirect influences are depicted in Fig. 1.

The correspondence analysis between actors and goals (Fig. 2) for the NMSEU group highlights a close relationship between sustainable and rural development, and the agricultural producers, EU and the municipalities. The concept of “cheap products” is close to consumers as socio-economic actors. Put in another way, in relatively lesser developed countries, low price is one of the most important characteristic features of products. These results are in line with previously published data [58, 59]. This is one of the most important cornerstones of the strategy of multinational companies, which try to utilize the cost advances of their global logistical supply chains [60, 61].

There are considerable differences in the bargaining power of SFSCs in old and new member

Tab. 4. Matrix summarizing the influence-dependence relations of different actors.

Actor	OMSEU	NMSEU	Actor	OMSEU	NMSEU	Actor	OMSEU	NMSEU
National governments			Rural population			Local food traders		
GOV	0	0	GOV	2	2	GOV	3	3
MUNICIP	1	2	MUNICIP	2	3	MUNICIP	2	2
CONS	1	3	CONS	0	0	CONS	1	2
AGRPR	1	3	AGRPR	0	2	AGRPR	1	2
RURALPOP	1	3	RURALPOP	0	0	RURALPOP	2	3
MULTIPROC	3	2	MULTIPROC	1	1	MULTIPROC	0	0
MULTITRADE	3	2	MULTITRADE	0	0	MULTITRADE	3	2
LOCALPROC	1	2	LOCALPROC	0	1	LOCALPROC	0	1
LOCALTRADE	1	2	LOCALTRADE	0	0	LOCALTRADE	0	0
EU	3	3	EU	2	2	EU	2	2
Local governments			Multinational food processing comp.			European Union		
GOV	3	2	GOV	1	2	GOV	1	3
MUNICIP	0	0	MUNICIP	0	2	MUNICIP	0	2
CONS	1	2	CONS	0	2	CONS	0	2
AGRPR	1	3	AGRPR	0	1	AGRPR	0	2
RURALPOP	2	3	RURALPOP	0	2	RURALPOP	0	2
MULTIPROC	3	1	MULTIPROC	0	0	MULTIPROC	3	1
MULTITRADE	3	1	MULTITRADE	2	1	MULTITRADE	3	1
LOCALPROC	1	3	LOCALPROC	0	0	LOCALPROC	0	1
LOCALTRADE	1	3	LOCALTRADE	0	0	LOCALTRADE	0	1
EU	2	2	EU	1	2	EU	0	0
Consumers			Multinational food trade companies					
GOV	2	2	GOV	1	2			
MUNICIP	0	0	MUNICIP	0	2			
CONS	0	0	CONS	0	2			
AGRPR	0	1	AGRPR	0	1			
RURALPOP	0	1	RURALPOP	0	2			
MULTIPROC	3	1	MULTIPROC	1	1			
MULTITRADE	3	1	MULTITRADE	0	0			
LOCALPROC	1	1	LOCALPROC	0	0			
LOCALTRADE	0	2	LOCALTRADE	0	0			
EU	2	2	EU	1	2			
Agricultural producers			Local food processors					
GOV	3	2	GOV	3	3			
MUNICIP	1	1	MUNICIP	2	2			
CONS	1	1	CONS	1	2			
AGRPR	0	0	AGRPR	2	2			
RURALPOP	0	1	RURALPOP	2	3			
MULTIPROC	3	1	MULTIPROC	0	0			
MULTITRADE	0	0	MULTITRADE	3	0			
LOCALPROC	0	0	LOCALPROC	0	0			
LOCALTRADE	0	1	LOCALTRADE	0	2			
EU	3	2	EU	2	2			

OMSEU – old member states, NMSEU – new member states, GOV – national governments, MUNICIPAL – local governments, CONS – consumers, AGRPR – agricultural producers, RURALPOP – rural population, MULTIPROC – multinational food processing companies, MULTITRADE – multinational food trade companies, LOCALPROC – local food processors, LOCALTRADE – local food traders, EU – European Union.

Interpretation of scale-values: (0) – no direct influence, (1) – actor can eliminate the tactical steps of actor B, (2) – actor A can jeopardise/eliminate the projects of actor B, (3) – actor A can jeopardise/eliminate the strategic goals of actor B, (4) – actor A can substantially influence/dominate actor B.

Tab. 5. Actor-goal matrix in the new member states.

Actor	Goal					
	SUSTDEV	RURDEV	FOODSAF	PRODCH	CHEAP	LOGI
National governments	3	3	4	2	1	0
Local governments	3	4	3	1	0	0
Consumers	1	1	4	4	2	0
Agricultural producers	1	3	3	0	0	0
Rural population	2	4	4	3	4	0
Multinational food processing companies	0	0	4	2	0	4
Multinational food trade companies	0	0	4	3	3	4
Local food processors	1	4	4	4	0	0
Local food traders	1	4	4	4	1	0
European Union	4	4	4	3	1	0

SUSTDEV – sustainable development, RURDEV – rural development, FOODSAF – food safety, PRODCH – increasing product choice, CHEAP – cheap food, LOGI – cost cutting by building up global food supply chains.

Interpretation of the scale values: (-4) – the objective is against the vital interest/jeopardizes the existence of the actor, (-3) – the objective jeopardizes the strategic mission of actors, (-2) – the objective jeopardizes the tactical goals of the actors, (-1) – the objective does not match or is slightly different from the operative goals of the actor, (0) – the actor’s attitude towards the goal is neutral, (1) – the objective is in line with the operative goals of the actor, (2) – the objective is in line with the tactical goals of the actor, (3) – the objective considerably supports the strategic goals of the actor, (4) – the objective is a vital interest of the actor.

states of EU. The influence-dependence matrices in OMSEU highlight a considerable level of influence of agricultural producers on the political arena. Interestingly, multinational companies have a relatively lower level of influence and a higher level of dependence. National governments and municipalities have a high level of authority. These results are in line with the literature [62]. On the contrary, in NMSEU local actors in general, and local food processors and local food traders in particular, have a low level of influence and a high dependence.

The perceived influence of the European Union is much higher in NMSEU than in OMSEU.

CONCLUSIONS

Under current conditions, and without considerable changes in the regulatory framework, it is hard to expect the development of SFSCs in NMSEU. From this it follows that there is an urgent need for change in the current regulatory system. This should be built on three pillars:

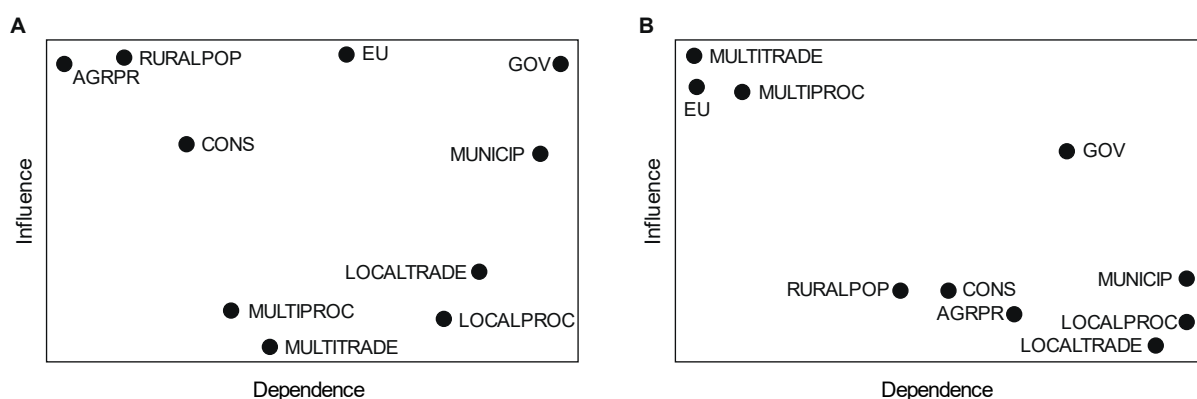


Fig. 1. The influence-dependence matrix in old and new member states of the European Union.

A – old member states, B – new member states.

GOV – national governments, MUNICIPAL – local governments, CONS – consumers, AGRPR – agricultural producers, RURALPOP – rural population, MULTIPROC – multinational food processing companies, MULTITRADE – multinational food trade companies, LOCALPROC – local food processors, LOCALTRADE – local food traders, EU – European Union.

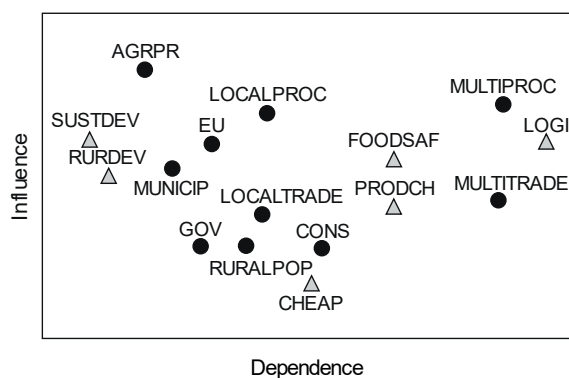


Fig. 2. Results of correspondence analysis in the new member states of the European Union.

Actors: GOV – national governments, MUNICIPAL – local governments, CONS – consumers, AGRPR – agricultural producers, RURALPOP – rural population, MULTIPROC – multinational food processing companies, MULTITRADE – multinational food trade companies, LOCALPROC – local food processors, LOCALTRADE – local food traders, EU – European Union.

Goals: SUSTDEV – sustainable development, RURDEV – rural development, FOODSAF – food safety, PRODCH – increasing product choice, CHEAP – cheap food, LOGI – cost cutting by building up global food supply chains.

1. Coordinated support for SFSCs by economic policy measures. In the last few decades, NMSEUs have tried to enhance their attractiveness to foreign direct investors by following a relatively liberal competition policy [63]. A policy line designed to defend the interests of small and medium-sized local producers would be highly desirable. This should embrace:

- a. competition policy (sanctioning in a more stringent way any abuses by large-scale food retail enterprises of their economic superiority),
 - b. well-targeted financial support for local food processors (in contrast to current practice, this support should focus on well-founded, complex economic analyses of food processing enterprises incorporating the factors of uncertainty into the calculations), and
 - c. promotion of local producers' cooperatives.
2. Support for the upgrade of food safety systems in SFSCs. Obviously, the enhancement of food safety can be considered a common denominator of the different actors. Local food producers, in most cases, do not have the necessary financial resources to establish internationally recognized food safety certification systems, which is why these efforts should be promoted and supported by the member states. If this goal can be achieved, there is a favourable possibility for local food producers to become suppliers to multinational trade enterprises.
3. Education and encouragement of local pro-

ducers in the wide-ranging application of the latest methods of info-communication technologies. The proliferation of internet-based commerce will open new perspectives for the actors of SFSCs, but their preparedness leaves room for improvement. Consequently, national governments should promote computer-literacy and different methods of internet-based marketing activities among agricultural and food producers because, in this way, the present, long chains can be bypassed.

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