

## PROCESS MATURITY OF SHORT FOOD SUPPLY CHAINS

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### Abstract

The paper aimed to analyse the process maturity of short food supply chains. Process orientation has been recognized as a basic concept of the chains functioning. Based on developed Model of Process Maturity of Short Food Supply Chains, which was used to analyse 35 short food supply chains, it was found that the shorter the chain is and the less people are involved in it, the higher maturity of

processes could be observed that is govern by the institution of trust. The researchers identified also the shortage gap and overgrowth gap in the process maturity, which influence the sustainable extension of the short food supply chains.

**Key words:** short food supply chains, process orientation, process maturity

**Jel Code:** L11; O43; Q13

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### Introduction

The principal question of economy how to allocate goods received nowadays significant meanings the food products are being concerned. The development of production, distribution and consumption of food has let to creation of several models. Due to the globalisation processes the mainstream model has been named as a global food chain and characterised by large diversification actors and processes that taken together, mostly in the international framework of geographical, cultural or technological scopes, create a value chain through which food from the place of production is moved to the place of consumption. There are also other models, by contrast, named as alternative, that brake down with the (Surak et al. 2008, Deep and Dani 2009), scope of globalisation and focus more on local or regional characteristics of the chains (Galli and Brunori, 2013, Marsden at al. 2000, Mount 2011). Both models are in the continuous process of adaptation to the changing conditions of growth. As indicated by Galli and Brunori (2013) these changes have an innovative character and aims to re-organize the food supply chain in order to re-connect producers and consumers and re-locate agricultural and food production. Additionally they aims also to re-scale the food supply chain in order to increase the sustainability and multifunctionality of agriculture and food production as well as to reduce risks from market volatility and maximize the welfare as well as increase the competitiveness (Maciejczak and Zakharov 2011)

Some authors identify these changes as technology-centered, arguing that innovations are connected to rapid development and accessibility to technologies that make a significant changes in traceability, distribution efficiency, quality assurance or market information management (Woods et al. 2013). Indeed, in XX century, as it is shown i.e. by Knasefy et al. (2008), food system share undergone significant modernisation and mechanisation due to new

technologies. But this led to the rise of monopolistic power of large-scale food processors and retailers trying to control most parts of lengthening and globalising food supply chains. A major consequence of such developments has been the increasing disconnection between farming and food and thus between farmers, the traditional producers of food products, and final consumers. In response there is observed unprecedented critical scrutiny surrounding the nature and development of mainstream contemporary food systems. It is reflected in increasing societal concerns over the environmental and food safety, food health or fair distribution of profits. In the context of the discussions on the competitiveness of the food sector also any disturbances in the operation of the food supply chain can have serious economic and social impacts not only on farmers, but also consumers and the society as a whole. Price developments in recent years both at farm gate and consumer prices have clearly demonstrated the imbalances of power in the chain. This is the single most relevant aspect that is addressed in the most of food supply chains. The sheer difference in economic size between farmers and retailers makes it clear that the power is imbalanced towards the end links of the chain which started to dictate rules. The main causes of these imbalances can be put down to an increased globalisation and to a process of concentration, especially in the retail sector. The main consequences of these imbalances are relentless downward pressure on farm-gate prices. Farmers are not able to cover their production costs let alone have available funds to invest in farming, thus leading to the abandonment of their activity and major lack of investment in innovation (Mikkola 2008).

Thus, nowadays the technological changes seems not to be the leading drivers of change as they were considered in the past. It is clear therefore that some authors consider social factors as the drivers of changes (Tregera et al. 1998). The other one paid attention to the environmental concerns (Parrot et al. 2002). Both approaches however have been criticised as too narrow by the large movement of advocates of the sustainable growth. They follow the assumption that the food system, as a part of larger economic system, needs to develop synergistically in four spheres such as economy, social, environmental and institutional (Ilbery and Maye 2005). From their point of view food systems needs to ensure economic vitality, social responsibility, environment protection and conservation as well as institutional governance.

All these concepts are trying to present the changes in the food systems from several perspectives from macro scales such as environmental or social to micro scales such as single producer or single consumer, and thus lose from their eyeshot the elements of the system, which should be strengthened in order to ensure the expected innovative growth. What are these elements?

The emergence of innovative re-organization of food systems, both global and alternative ones raises a need for analysing them from other perspective than currently used functional. This is to see the food industry not through the single factors that influence the changes or single elements that construct the chains, even though they are considered in the perspective of the system, but through the synergy which is generated as an added value from linkages by which the elements of the chains are connected. This is achieved by the natural and rational optics of process orientation of the chain.

Many authors [i.e. Porter 1985, Davenport and Short, 1990, Hammer 1996, Hammer 1999, Lockamy and Mc Cormak 2004] at the turn of the centuries advocated to process re-orientation of the businesses and the chains they are tied into, regardless horizontal or vertical integration. In the food industry this has been achieved mainly in the large global food chains,

which achieved to manage synergies and added values coming from different forms of integration (Maciejczak 2012) .

The re-orientation process did not take place however in case of alternative food chains. Both researchers and industry professionals do not see and do not analyse and manage alternative food chains from the process oriented perspective. Which is due to the fact that the alternative food chains are relatively short and their impact is local or regional. However, by the fact that their importance is growing it is advisable to look more closely at the process orientation of the organization of these chains.

The paper aims to present the process maturity of alternative food supply chains on the example of short food supply chains (SFSCSs). In the current literature are analysed many different aspects of SFSCSs, i.e. organisation, practices, economic performance, sustainability both by single authors (Kirwan 2004, Rittkets et al. 2006, Tregear 2011) and large research projects, i.e. FODDLINKS, FAAN, IMPACT, SUPPLIERS or KeyQuest From these analysis new research areas are being identified asking questions about the social links renewal that SFSCs could induce, strategic decisions on what size fits best the operation, both economically and socially, skills and knowledge of the main SFSCSs actors needed, consumers' involvement in terms of their motives, perception, willingness to pay or directly engage, recognition, possibilities to reduce distribution costs, models of cooperation, impacts of different governance systems, the potential of public procurement, the use of territorial and quality branding, or an investigation of the controversial issue of their environmental impacts (Aubry and Chiffolleau, 2009, Galli and Brunori, 2013, Santini and Gomez y Paloma, 2013, Follet, 2009). The process orientation and process maturity of SFSCSs have not been undertaken yet.

### **The development of Short Food Supply Chains**

Food supply chain has been in the centre of academic, business and public scrutiny in the past years. In recent years there has been a renewed interest and a significant growth SFSCSs recognised as an alternative to the conventional food supply chains which allow primary producers and consumers to connect in new and more direct ways (Moroney et al. 2013). As summarised by Galli and Brunori (2013) the very concept of SFSCSs emerged at the turn of the century in the context of the broader debate on alternative and sustainable food chains and networks. It stood in the contrast to the prevailing trend in the agro-food system of the development of 'global value chains' dominated by retailers and characterised by unequal distribution of power between the different actors, long distance trade and industrialised food. SFSCS were considered as a strategy to improve the resilience of the family farms with the support of concerned consumers, local communities and civil society organisations (Hinrichs 2000, Hinrichs and Allen 2008).

The literature review of the definition of SFSCSs shows many different approaches to understand this concept. Galli and Brunori (2013) stressed out that the ideology of SFSCSs is that they are highly value-added and meaningful for their participants. The principal idea based on direct or the closest possible relationship between the producer and the consumer which involves construction of knowledge, value and meaning about the product and its provenance, production and consumption, the producer and the consumer themselves, rather than solely an exchange of a product. In general, SFSCSs are perceived as re-establishing authenticity in production and consumption. Nowadays meaning of SFSCS differs across various researchers, social groups, institutional settings and regional contexts. It involves

certain characteristics of SFSCSs and values associated to them (Kebir and Torre 2012). The criteria of definition in most cases relay on number of actors involved in the chain, physical distance, social distance, forms of governance, ways of information exchange, but also the ideas of cultural identity and food heritage are embedded. Marsden et al (2000) use the concept of SFSCSs as an “umbrella” term, and propose that SFSCSs should show four defining characteristics, in order to go beyond the conventional and classical definitions of short food chain and, in particular the issue of distance definition:

1. the capacity to re-socialize or re-spatialize food, thereby allowing consumers to make value-judgements about the relative desirability of foods on the basis of their own knowledge, culture, experience or perceived imaginary.
2. The redefinition of the relationships between producer and consumers showing clear signals as to the origin of food.
3. The development of new relationships for new types of supply and demand with new criteria that link price with quality criteria and the construction of quality. Usually, this food is defined by the place and the farm where it has been produced, and serve to enhance the image of the farm and the territory as a source of quality foods.
4. Emphasis on the relationship between producer and consumer to construct value and meaning, rather than solely the type of product itself, and all these are summarized in the ability to engender some form of connection between the consumer and the food producer.

The two basic criteria needed to define SFSCSs are physical and social proximity. As "short" indicates, in SFSCS these distances are reduced in comparison to conventional food chains. However, due to regional and cultural diversity of food systems there is no universal definition possible that would define the optimal physical distance of SFSCSs. Therefore in practice their metrical and physical boundary interpretations vary. Nevertheless, geographical proximity and location matter, as “short” is first of all perceived as something that is comparatively close physically and/or located and grown in a certain region or a locality.

Social distance (proximity) in formal terms finds expression as the number of intermediaries between producer and consumer. In SFSCSs, this number equals zero or very few (often one, but no more than two). In the latter case, intermediaries have to connect, rather than disconnect producers with consumers. It is important to highlight that social proximity implies the capacity of the chain to establish a channel of communication between producers and consumers, that give producers the possibility to control information given to final consumers and to receive feedback from them, regarding not only the name of the producer, food quality features or farming practices but also the ethical and social values of the process. Then, the consumer can make connections and associations with the society and territory involved (Marsden et al., 2000).

Reduced distances have implications on the organisation of food supply chains. The developed mutual commitment and trust between producers and consumers often substitute or reduce the need for formal confirmation of certain qualities materialised in forms of certificates and labels (Lamine, 2005). SFSCSs represent also an alternative type of governance and organisation of food chains. Many of them are bottom-up initiatives in which producers and consumers, who are often passive and subordinated participants in conventional global chains, become influential and active actors as owners of these chains who exert power and control in them. The role of territory evokes the embeddedness of SFSCSs in local territorial resources and its contribution to territorial development.

In Rural Development Programmes 2014-2020 the European Commission integrated short supply chains in its regulation. According to article 2 “m” of the Regulation (EU) No. 1305/2013 “*short supply chain means a supply chain involving a limited number of economic operators, committed to co-operation, local economic development, and close geographical and social relations between producers, processors and consumers*”. Two aspects become clear after careful analysis of this definition, these are: process orientation and value added focus. Process orientation is being expressed by description of the elements of the chain involved in its functioning, namely producers, processors and consumers. But, what is more important the Commission is also defining the type of the linkages that they should be tied up, namely co-operation, social relationship and economic development. The later linkages describe the value added through which the development might be ensure. In these definition proximity (geographical and social) seems not to play leading role, as its aim is to narrow the area of the SFSCS impact.

There are many different examples of SFSCS. They were described by many case studies. As an examples there could mention these when farmer sales product directly to consumer (i.e. direct purchase from farm by consumers, box schemes, roadside sale, farmers’ markets, food foraging, pick your own shemes, etc.) or indirectly (i.e. consumer cooperatives, , internet sales, restaurants that directly purchase products from farmers, shops owned by farmers, etc.). Hence numerous of examples could be identified also several classification and typologies of SFSCS have been identified. Marsden et al, 2000 and Renting et al, 2003 agreed to three main types of short food chains on the basis of the number of intermediaries, physical distance and organisational arrangements:

1. Face-to-face SFSCSs in which a consumer purchases a product directly from the producer/processor on a face-to-face basis and authenticity and trust are mediated through personal interaction (e.g. on-farm sales, farm shops, farmers’ markets).
2. Proximate SFSCSs which extend reach beyond direct interaction and are essentially delivering products which are produced and retailed within the specific region (or place) of production. Consumers are made aware of the ‘local’ nature of the product at retail level (e.g. consumers’ cooperatives, community supported agriculture).
3. Spatially extended SFSCSs where value and meaning laden information about the place of production and producers is transferred to consumers who are outside the region of production itself and who may have no personal experience of that region (e.g. certification labels, restaurants, public food procurement to catering services for institutions).

Other authors, i.e. Chaffotte and Chiffolleau (2007) distinguished between individual and collective, direct and indirect (with one intermediary) SFSCSs. Peters (2012) have identified three types of SFSCSs on the basis of their individual or collective organisation and initiators (producers and consumers): Direct sales by individuals, Collective direct sales, Partnerships of producers and consumers. Interesting classification is described in the report edited by Santini and Gomez y Paloma (2013) whom argue that it is possible to differentiate between ‘traditional’ and ‘neotraditional’ SFSCSs. The former are farm-based, in rural locations, usually operated on-farm by family businesses and using traditional and artisan production methods. The latter consist of more complex collaborative networks, are often off-farm (delivery schemes in particular), located in urban or peri-urban areas and foreground strong social and ethical values. The authors suggest that they may be more subject to a non-profit approach. Both models can be equally innovative and dynamic chains and many individual cases combine characteristics of both of them in a ‘hybrid’ manner.

Today SFSCS are increasingly taken into consideration by rural and food policies as a driver of change towards sustainability both in agro-food system and rural areas. They are recognized as systems that have economic, social and cultural as well as environmental benefits for farmers, consumers and rural areas in general. There is waste body of analysis that aimed to analyse the sustainability impact of SFSCSs. There are evidences that with regard to economic viability the model of SFSCS increases the income of farmers and the consumption of fresh and relatively unprocessed food, brings consumers and farmers closer, , helps to strengthen rural-urban linkages (particularly in the case of peri-urban agriculture as well as reduces economic uncertainties that result from varying production and sales (Ilberya et al. 2004). Other authors identify trust and fairness as well as flexibility, cultural heritage conservation and information exchange, building social capital of communities as major strengths of SFSCSs with regard to social impact (Renting et al. 2012). The most discussed area on which there is no clear consensus about the impact of SFSCS is environment dimension of sustainability. Some authors that environmentally friendly practices such as short transportation distances thus reduction of CO2 emission from transport, environmentally friendly production and processing practices, responsible use of packages de facto are in favour of a positive impact (Plassmann and Edwards-Jones, 2009). Other authors argue that these environmentally sound practices do not show benefits especially in longer terms (Williams et al. 2006). It needs to be pointed out that although the issue is broadly elaborated there are no relevant and reliable evidences that clearly could assess the environmental impact of SFSCSs yet. A systematic review of existing literature has also identify lack of analysis concerning institutional governance of SFSCSs, both with relation to internal and external institutions that would contribute to the description of SFSCSs impact on sustainability in broader sense. In many case studies (Santini & Gomez y Paloma 2013 or Karner 2010) these institutions are mentioned (i.e. rules of sale, promotion mechanisms, information exchange measures, support measures) but so far have not been analysed in a systemic way.

## **Methodology**

Research literature has extensively discussed the potential impacts of SFSCSs. They analyses several case studies, but there are not so many examples of comparative approaches across geographical context or between types of short chains. As stressed in the IPTS JRS report edited by Santini & Gomez y Paloma (2013), whom did such analysis this is due to the difficulties of collecting comparable data on micro enterprises and initiatives. Thus, having in mind the paradigm of process orientation and value added focus there has been developed a research framework that led to development of the model through which the process maturity of SFSCSs could be described and analysed.

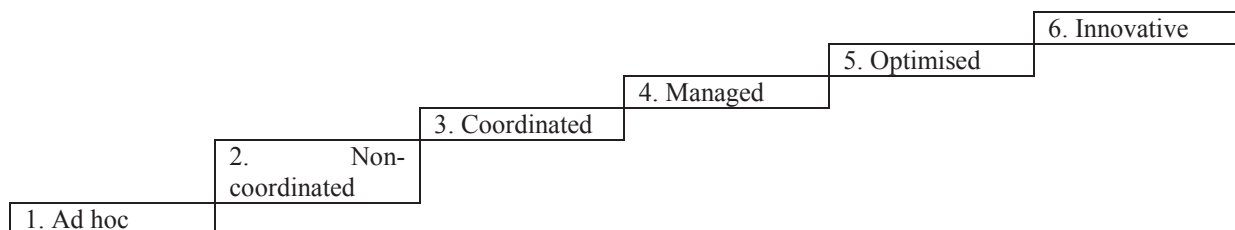
The processes are core tasks of any organization design. Among the various approaches that support business process management, maturity models receive increasing attention (Röglinger et al. 2012; Bucher and Winter, 2010, de Bruin et al., 2005). This is in line with the general popularity of maturity models across a wide range of application domains, the expected increase in adoption by industry and the growing academic interest in such models. Maturity models typically include a sequence of levels (or stages) that form an anticipated, desired, or logical path from an initial state to maturity (Buhl et al., 2011). An organization's current maturity level represents its capabilities as regards a specific class of objects and application domain (Rosemann and de Bruin, 2005). Maturity models are used to assess as-is situations, to guide improvement initiatives, and to control progress. As identified by Smith and Fingar (2004) two types of maturity models can be identified: process maturity models and process management maturity models. The former refer to the condition of processes in

general or distinct process types, the latter address a company’s management capabilities. The popularity and significance of maturity models leads to the question of how advanced different organisations are in their processes development.

As summarised by Rosseman and de Bruin (2005) maturity as a measure to evaluate the capabilities of an organisation in regards to a certain discipline has become popular since the Capability Maturity Model (CMM) has been proposed by the Software Engineering Institute at Carnegie Mellon University. Whilst the original CMM has a specific focus on the evaluation of software development processes, this model has been varied and extended in a number of approaches. In example Maciejczak (2012) used CMM model to assess the maturity of food industry companies. Valadares de Oliveira et.al (2011), Lockamy and McCormack (2004) and Szymczak (2013) used this model to measure the maturity of processes of the whole supply chain. In the literature there are also identified other approaches to measure and assess processes maturity of both companies and chains, as an examples could be mention model proposed by Hammer (2007).

In general the development of process maturity models is based on the phenomenological approach to assess the organisation’s perception of its maturity, using objective measures as a guideline with the main focus on the value added orientation (Bucher and Winter, 2010, Buhl et al. 2011, Rosemann et al. 2006, Van Looy et al. 2013, Van Looy et al. 2011). These measures could be identified in many different ways, with the Delphi technique as most commonly used (de Bruinand Rosemann, 2007, de Bruin et al. 2005, Van Looy et al. 2011, Van Looy et al. 2014. The model itself consists of several stages, levels through which the maturity is expresses, from most simple processes organisation to the most sophisticated processes’ optimisation and innovation.

In order to identify appropriate measures to assess process maturity of short supply chain there was identified a focus group of 18 experts, from which 6 were scholars (2 engaged in process management research, 2 in food supply chain management research and 2 in agricultural economics research), 6 short supply chain operators (3 farmers, 3 intermediaries), 4 consumers that use SFSCS and 2 officials (one from regional and one from central level). They were selected based on their declaration of knowledge about SFSCS. In October 2013 all received a short on line introduction to the process management and process maturity as well as reports with available in literature case studies of SFSCSs. In the period October – December 2013 there were executed 4 sessions through which the experts have identified from initial 38 processes the final 6 core processes that constitute the functioning of the short food supply chain. These are: logistics, communication, coordination, organisation, supervision, development. Based on these processes there were identified 6 stages of SFSCS maturity: ad hoc, non-coordinated, coordinated, managed, optimised, innovative. The picture 1 presents the levels of process maturity of short food supply chains.



**Graph 1. Process maturity of short food supply chains.**

Sources: own research

Based on the description of development of selected 6 processes and levels of short food supply chains maturity there was developed the matrix in which maturity levels were characterised and described. Table 1 describes the Model of Process Maturity of Short Food Supply Chains. The initial model was verified in between session 3 and 4 of the Delphi technique through execution of 5 feasibility case-studies of SFSCS. These was the innovation introduced to the Delphi technique in order to ensure the applicability of its results. Based on these case studies exact characteristics of maturity of the processes were defined.

**Table 1. The Model of Process Maturity of Short Food Supply Chains**

Processes	Levels of maturity					
	1	2	3	4	5	6
	Ad-hoc	Non-coordinated	Coordinated	Managed	Optimised	Innovative
<b>Logistics</b>	Sale in undetermined location, non regular, any assortment	Sale in undetermined location, regular, any assortment	Sale in a fixed location, regular, any assortment	Sale in a fixed location, regular, assortment that was in accordance with the needs identified	Sales in a fixed location, regular of specified assortment of quantity, quality and packaging reported by customers	Distribution channels are subject to review and change as necessary
<b>Communication</b>	Lack of information about the possibility to buy	Any information about the possibility of buy is provided	Established channels and forms of communication	Feedback information about the needs of customers	Feedback information about the needs of particular customers	Shaping the needs of customers
<b>Coordination</b>	Lack of the need of coordination	Lack of coordination	There is a coordinating body	There are standards of coordination	There are standards of coordination with regard to particular customers	Coordinating bodies and standards are subject to review and change as necessary
<b>Organisation</b>	Lack of responsibilities defined	Identified responsibilities	Non formal organisational structure that is variable	There is formal organisational structure	Identified strategy of development	Outsourcing
<b>Supervision</b>	Lack of any supervision	Defined (formal and informal) verification criteria	Informal internal supervision	Formal internal supervision	External supervision	The conclusions of supervision are used to generate changes
<b>Development</b>	No needs to make changes	Needs to make changes are identified but the changes are not implemented	Implementation ad hoc of corrective actions	Planning and implementing of improvement changes	Innovation (product, process, marketing, organization)	User Driven Innovation

Sources: own research

It has been assumed that the more sophisticated processes the more mature processes in SFSCS are. The grey cells in the table 1 express compulsory characteristics of processes development that needs to be achieved in order to obtain given stage of maturity. For the 1<sup>st</sup> level of maturity – ad hoc, only the logistic process is needed to be initiated, whilst for the 6<sup>th</sup> level of maturity – innovative, all 6 core processes should be full blown.



The developed model of process maturity of short food supply chains has been used to assess the maturity of selected chains that were identified in the selected localisation. This localisation has been identified based on the criteria of peri-urban character of the area. The chains were selected based on the type according to Peters (2012): direct sales by individuals, collective direct sales, and partnerships of producers and consumers, with two compulsory requirements that they should function more than one year and based on certified organic food.

There was selected Bemowo district which is one of 17 districts of Warsaw municipality. The district is situated in the Northwest area of the city. Bemowo is placed near Kampinos National Park, surrounded with rural areas specialised in fresh fruits and vegetable production and processing, but it also boasts good transport links with the city centre and the country through direct access to the speed-way belt gridding the city. The Bemowo district occupies an area of 25 square kilometres, where lives ca. 100.000 inhabitants.

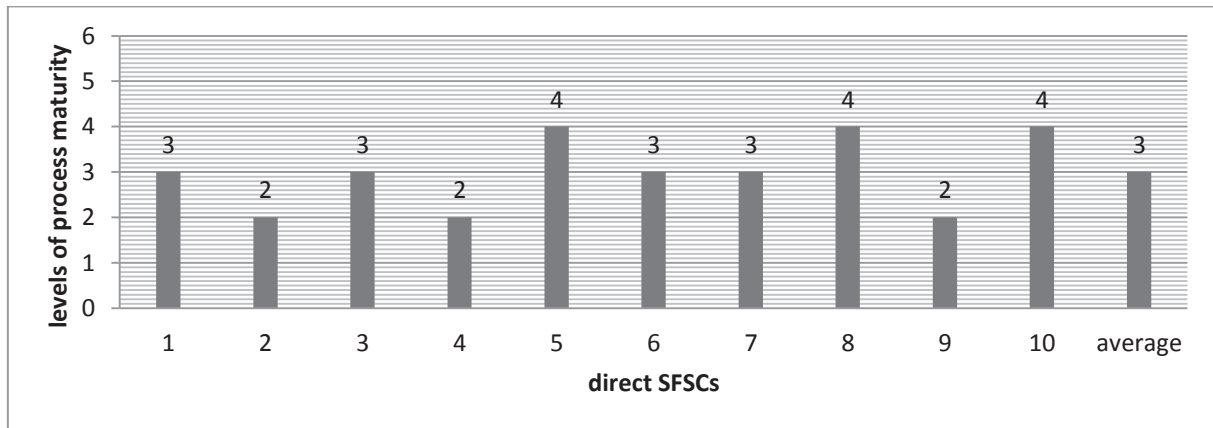
For the research purposes there was selected the sample of the following 35 chains. In the category direct sales by individuals there were 4 consumers purchasing food directly from the organic farm and 6 organic farmers delivering boxes to consumers. In the category collective direct sales there were 15 organic farmers selling their products on the open market, 4 shops with organic food and 2 restaurants that procure food directly from organic farmers. And in the category of partnerships of producers and consumers there were 4 informal food cooperatives. In the period March-June 2014 in total 96 individuals directly involved in the analysed SFSCs (farmers, intermediaries, consumers) were asked to assess the maturity of the chains' processes through structured descriptive interviews. The opinions were verified through in depth evidence based observations.

## **Results and discussion**

The researches gave the opportunity to identify overall process maturity of short supply chains operating in one locations in Poland by utilising developed model of process maturity. The model allowed also to assess development of core processes that design the chain and provide add value. Additionally by using selected typology of SFSCs there was also an opportunity to identify differences between different types of the chains.

As the general conclusion from the analysis of 35 selected SFSCs there could be stated that on average they are on very low maturity level, as the mean equals to 2. That means that overall the processes are not much coordinated and specifically only logistics and communication on low level are taking place. The situation however becomes more diversified and interesting when taken into account different types of analysed SFSCs.

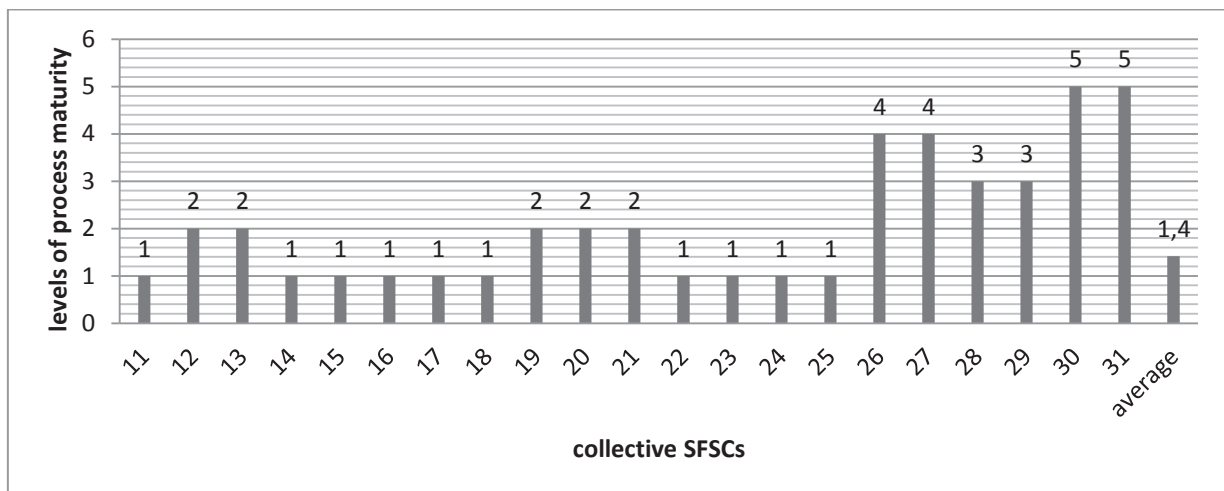
As it could be taken from the graph no. 2 overall maturity of direct sale type of SFSCs equals to 3, which means that these chains on average are coordinated and at least processes such logistics, communication and coordination are well developed. Half of the analysed chains have overall maturity of processes on the 3<sup>rd</sup> level, while 3 of them higher reaching 4<sup>th</sup> level as well as 3 chains have lower process maturity being on 2<sup>nd</sup> level.



**Graph 2. Process maturity of direct sale type of short food supply chains.**

Sources: own research

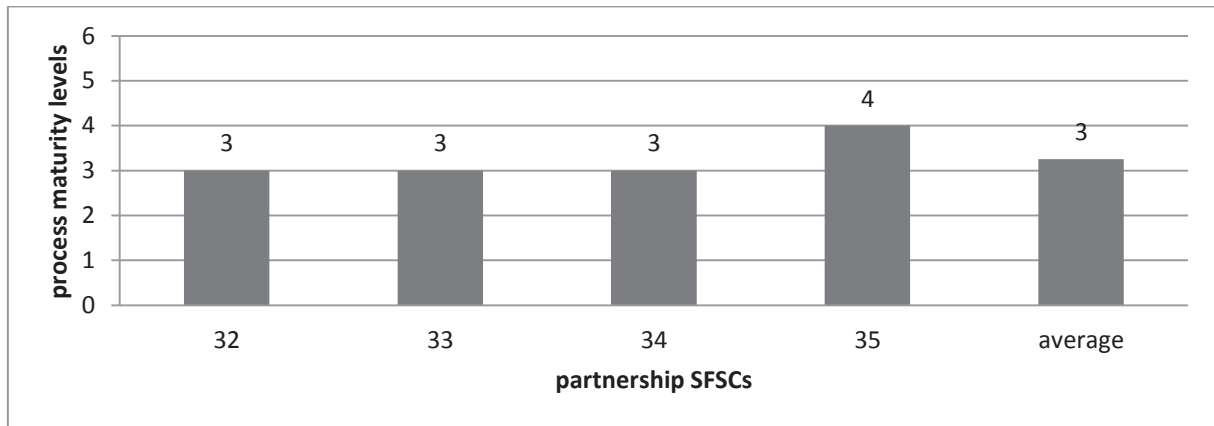
There are several case studies that describe collective sale type of short food supply chains as more developed than direct sale type. This has been however denied when process maturity was taken into account. As it is shown from the graph no 3 the average process maturity of analysed collective sale SFSCS did not reach 2<sup>nd</sup> level. The analysis indicated that 10 chains out of 20 have developed only logistics processes, while underdevelopment of other, thus their maturity is on 1<sup>st</sup> level. There are 4 chains which overall process maturity is on the 4<sup>th</sup> and 5<sup>th</sup> level. The underdeveloped chains are mostly chains that based on direct sale of food by farmers at the local markets, while the well-developed chains are shops, restaurants and canteens.



**Graph 3. Process maturity of collective sale type of short food supply chains.**

Sources: own research

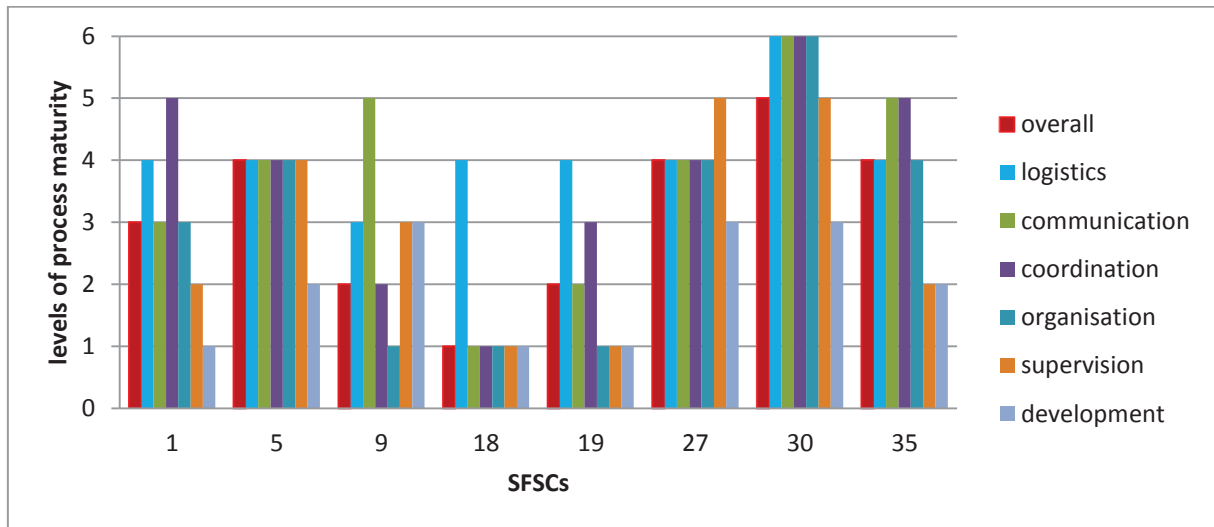
The analysis of graph no. 4 indicates that the partnership SFSCs which are informal cooperatives functioning at local settlements are on average well developed and their process maturity has been assessed on 3 level. This result is obtained mostly due to the fact that the partnership a part from good logistics and communication requires also well managed coordination, as the chain involves many actors on both demand and supply side.



**Graph 4. Process maturity of partnership sale type of short food supply chains.**

Sources: own research

More in depth analysis of processes that build the added value of the of the short food supply chains and were considered as core one for their process orientation shows interesting results with regard to the process maturity. On the graph no 5 there were presented selected chains that represents all three types of SFSCs taken into consideration in this research. They were presented with regard to the assessment of the maturity of their core processes. As it is assumed in the process maturity model construction in order to reach certain level of the maturity different processes need to be mature minimum on exact level.



**Graph 5. The maturity of selected processes of selected short food supply chains.**

Sources: own research

The analysis show however that in the group of processes that build up process orientation there are some that are significantly underdeveloped below the overall maturity level and thus form constrain for further growth. This become visible when one analyse chain no. 5, which overall is on the 4<sup>th</sup> maturity level, most processes are also at the 4 level, only the processes of development are developed on 2<sup>nd</sup> level. Similar situation could be identified in case of chain no. 9 when underdevelopment of organizational processes unable classification on higher level then 2<sup>nd</sup>. There exist also another example when chain no 30. In several processes

reached 6th, the highest level of maturity but its overall maturity is downsized by low growth of development process. This situation could be characterised as shortage gap in the development of process maturity of SFSCs. There exist selected processes that due to low level of their development make it impossible to reach high level of overall process maturity and drive the growth of the chain.

On other hand there could be identify processes that are on higher level of development than the overall process maturity of the chain. This is shown in case of chains no. 19 or 27 on the graph no. 5, where logistics in first case and supervision in second one are better developed than all other analysed processes. These processes could be recognized as factors affecting the functioning of the chain in two ways. They might pull the development of other processes like in case of chain no. 19, where logistics processes' development force better communication or coordination. But also, they would be bottlenecks that constrain the progress, like in case of the chain 27, where developed surveillance would block other processes, especially innovative one. This constrains could be named as overgrowth gaps.

### **Conclusions**

Base on the conducted researches based both on in depth literature review and field studies there could be drawn several conclusions with regard to the process maturity of short food supply chains.

It could be argued that in the substantial body of literature there were no researches that aimed to analyse the short food supply chains from the perspective of process orientation, although processes are recognized as a basic concept of the chain functioning. This is probably due to the fact that, as they are named, these chains are alternative to large global food supply chain and are short, consisting of two or three actors. Nonetheless the shortage of the chain it is based on the processes, although one recognize them or not, and as such might be and should be an issue of academic reflection. This has been proved by the development of larger food chains, that the look from the perspective of process maturity would be insightful also for practical reasons.

The Model of Process Maturity of Short Food Supply Chains has been developed with the phenomenological approach to assess the organisation's perception of its maturity, thus might be a case of critics due to the selection of processes or their characteristics as limited for certain region. Countering allegations it could be argued that the analysis of available case studies have shown that regardless the geographic location of the SFSCs, due to their shortages expressed by the number of actors and general purpose of deliver with added value food from field to fork these chain are built from the same type of processes identified in the model. It does not mean that the model could not be adjusted to specific conditions and exact cases, thus should be considered also as a generic tool. Conducted researches have proved that the model could be a useful tool to analyse short food supply chains from process orientation point of view.

The evaluation based on the Model of Process Maturity of Short Food Supply Chains of 35 different chains from Poland have shown that the shorter the chain is and the less people are involved in it the higher maturity of processes could be observed. This is connected to personal liability that is associated to the engagement in the chain. People are feeling more responsible when they interact face to face. This liability could be recognized not only as a

social factor or connected to appropriate behaviour but also as an economic institution that governs the chain and through is contributing to sustainable growth.

The researchers identified also the shortage gap and overgrowth gap in the process maturity, which influence the sustainable extension of the short food supply chains. It should be stated therefore that uneven development of processes that build process orientation of the chain could be significant constrain for its growth and securing of high level of value lading.

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