SMARTCHAIN

SMART SOLUTIONS IN SHORT FOOD SUPPLY CHAINS

Deliverable 7.3

Best practice guide for the implementation of innovative solutions in SFSCs

Work Package 7

AZTI

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Executive Summary

The central aim of SMARTCHAIN is to foster and accelerate the shift towards collaborative short food supply chains (SFSCs) and, by means of specific actions and recommendations, to introduce new robust business models and innovative practical solutions that enhance competitiveness and sustainability of the European agri-food system. Using bottom-up, demand-driven research, the SMARTCHAIN consortium (43 partners from 11 European countries) undertakes a multi-perspective analysis of 18 case studies (from 9 project partner countries) and the state of the art of SFSCs in terms of technological, regulatory, social, economic and environmental factors, assesses the linkages and interactions among all stakeholders involved in SFSCs and identifies the key parameters that influence sustainable food production and rural development among different regions in Europe.

Specifically, the main objective of WP 7 (Business and Policy Recommendations) is to generate a collection of tools as well as business and policy recommendations to implement innovative solutions in SFSCs, primarily improving the competitiveness and sustainability of SFSCs and making them smarter and more equitable, inclusive, and sustainable. One of these tools is a **best practice guide for the implementation of innovative solutions in SFSCs** (T7.1.2), the subject of this deliverable.

The guide has taken as inputs the successful innovation examples compiled in the inventory, the results of the 12 ongoing successful innovations selected in the project (D7.1: Inventory of successful cases of the application of innovation in SFSCs) and the findings and recommendations obtained in WP 2 (Technological and non-technological innovations), WP 3 (Social innovation), WP 4 (Food-related consumer aspects), and WP 5 (Integrative sustainability assessment). The country-regional effect, especially associated to economic, environmental, legal-governance and socio-cultural indicators, and the role of the different stakeholders of the value chain have been highlighted throughout the text where necessary. Knowledge transfer recommendations were also included, not only to provide advice to SFSCs but also to improve the communication and interaction between short supply chains and the stakeholders (e.g., research and technology providers).

Specifically, this **best practice guide** (Annex I) includes:

a) The **meaning and key aspects of SFSCs**.
b) An overall description of **the SFSC context in Europe** (general characteristics of SFSCs from a business perspective, types of SFSCs, regulation context, typical bottlenecks and successful factors of the SFSCs, etc).
c) The **definition and types of innovation** (including the **general characteristics of successful innovations** and the **role of the stakeholders** in the innovation process).
d) **Examples of successful innovation**.
e) **General recommendations for implementing innovation.**
f) **A step-by-step guide to help the practitioner on the road to innovation**, maximising the probability of successful implementation (includes 6 steps with over 300 questions and more than 60 recommendations).
g) A tool for using **innovation for redesigning SFSCs to face off SARS-CoV-2 pandemic**.

This guide is also a tool for **identifying opportunities and strategies** to enable successful regional technological, non-technological and social innovations. Basically, it is designed to help SFSCs in the practical **implementation of technological, non-technological and social innovative solutions**. For ease of understanding and for dissemination purposes, **an infographic version of the guide** has also been prepared, with key information only (Annex II).

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1. Introduction

The aim of the SMARTCHAIN project is to foster and accelerate the shift towards collaborative SFSCs and to introduce new business models and innovative practical solutions that enhance the competitiveness and sustainability of the agri-food system in Europe.

The main objective of the WP 7 (Business and policy recommendations) is to generate a collection of tools as well as business and policy recommendations to implement innovative solutions in SFSCs, (1) improving the competitiveness and sustainability of short food supply chains by making them smarter and more equitable, inclusive and sustainable, (2) contributing to the framework necessary to boost the creation of new business opportunities and new SFSCs in the EU and (3) fostering collaboration among SFSC stakeholders (farmers, food producers, consumers, research and technology providers, policy makers, etc).

The specific objectives of this WP are the following:

1) Creation of tools (successful cases' inventory, best practice guide) to support the practical implementation of innovative solutions in short supply chains (T7.1);
2) Development of reference exploitation models in SFSCs based on the innovative solutions detected (T7.2);
3) Creation of a best practice guide for the application of reference exploitation models, improving business performance in SFSCs and helping farmers, food producers and regions to capitalise on their distinctive territorial capital to foster sustainable growth and the development in rural areas (T7.3);
4) Identification of legal and policy recommendations and strategies to overcome regulatory barriers (T7.4).

This deliverable provides the best practice guide for implementing innovation in SFSCs (Specific objective 1), created in the T7.1.2 "Best practice guide for the implementation of innovative solutions". This task was led by AZTI, with the participation of CBHU, OS, IAMB, UNITO and UOB. The resulting best practice guide is a **public document**, useful for all SFSC stakeholders interested in improving their competitiveness and sustainability based on innovation implementation, making them smarter, fairer, and more inclusive. It will be freely available on the Innovation Platform WP 6.

2. General framework and content

In the last two decades, alternative food supply initiatives and networks have blossomed across Europe. Such experiences began in countries where problems associated to (1) industrialisation of agricultural processes, (2) continued abandonment of the countryside and (3) problems farmers faced when accessing prevalent sales channels emerged for the first time. Such initiatives (i.e., farmers' markets, farm shops, community supported agriculture, online shops) meant to reconnect producers and consumers have been labelled 'short food supply chains' (SFSCs). Since SFSCs respond to several needs and opportunities, for both of farmers and consumers, their promotion is one of the aims of the Common Agricultural Policy of the European Commission (EC) for localisation and re-localisation of agri-food systems to improve the competitiveness of farmers and producers.

Despite their continuous development and the support of governments and authorities (from European to local level), SFSCs have faced difficulties that prevent or limit their success and progress. Some of these challenges can be resolved by applying **innovative solutions** already on the market, which could be tailored to meet the SFSCs' scale. However, small farmers and producers associated to SFSCs often do not have the resources (money, time, personal and knowledge) to find, apply, and adapt such innovations and, finally, to resolve

those problems by themselves. Closing these gaps would actively contribute to transforming the SFSC into a concrete and sustainable alternative to the globalised food system.

In this context, the EU project **SMARTCHAIN** aims to foster and accelerate the shift towards collaborative SFSCs and, through specific actions and recommendations, to introduce innovative practical solutions that enhance the competitiveness and sustainability of the European agri-food system. One of these specific actions is the current deliverable, a **best practice guide to help small farmers and producers involved in SFSCs to implement innovative solutions**.

To prepare the guide, the successful innovation examples compiled in the inventory, the results of the 12 ongoing successful innovations selected in the project (D7.1: Inventory of successful cases of the application of innovation in SFSCs) and the findings and recommendations obtained in WP 2 (Technological and non-technological innovations), WP 3 (Social innovation), WP 4 (Food-related consumer aspects), and WP 5 (Integrative sustainability assessment) were taken as inputs. The 18 SMARTCHAIN case studies were also examined from a business and innovation standpoint, collecting answers to more than 40 questions (including economic data from 2015-2018). Although 18 is a low number to capture the diversity of the European SFSC ecosystem, the dedicated selection of representative widespread short chains including all types of SFSC initiatives (cooperatives, individual direct sales, etc), the quality of the collected data and the lack of similar studies justify the suitability and relevance of the work carried out.

Based on the **SMARTCHAIN's multi-actor approach**, to prepare this deliverable a team of 17 experts from 6 European institutions (AZTI, Campden BRI Hungary, the Mediterranean Agronomic Institute of Bari, Organic Services, the University of Belgrade and the University of Torino) from Germany, Hungary, Italy, Serbia and Spain were involved. Furthermore, 9 experts from AMPED, EUFIC, KIS, ISEKI, the University of Hohenheim and the University of Crete (Austria, Belgium, Germany, Greece, Hungary and the Netherlands) revised this guide and contributed their knowledge.

The **best practice guide for the implementation of innovative solutions in SFSCs** (provided in the Annex I) includes:

a) The **meaning and key aspects of SFSCs**.
b) An overall description of **the SFSC context in Europe** (general characteristics, types, regulation context, typical bottlenecks and successful factors of the SFSCs, etc).
c) The **definition and types of innovation** (including the **general characteristics of successful innovations** and the **role of the stakeholders** in the innovation's process).
d) **Examples of successful innovation**.
e) **General recommendations to implement innovation.**
f) **A step-by-step guide to help the practitioner on the road to innovation**, maximising the probability of successful implementation (including 6 steps). This tool makes SFSC companies think in depth about their business (problems, needs, competitive advantages) and facilitates the identification and implementation of innovations.
g) A tool for using **innovation for redesigning SFSCs to face off SARS-CoV-2 pandemic**.

This deliverable was **basically designed to help SFSCs practitioners**, also providing the necessary context. The country-regional effect, especially associated to economic, environmental, legal-governance and socio-cultural indicators, and the role of the different stakeholders were highlighted throughout the text where necessary. Knowledge transfer recommendations were also included, not only to provide advice to SFSCs but also to improve the communication and interaction between farmers and stakeholders (e.g., research and technology providers). This best practice guide may also **facilitate the identification of opportunities and strategies** to enable successful regional technological, non-technological and social innovations. For ease of understanding and for dissemination purposes, an infographic version of the guide has also been prepared, with key information only (Annex II).

3. Main findings

The main inputs provided in the guide are: (1) general characteristics of SFSCs in Europe (based on SMARTCHAIN case studies), (2) general characteristics of a successful innovation, (3) 6 general best practices for implementing innovation and (4) a step-by-step path to innovation (for more details, please see Annex I).

General characteristics of SFSCs in Europe

Organisational and economic characteristics

- SMEs, typically micro and small enterprises
- Turnover: < €10 m (normally €0.1-0.5 m)
- Profit: 5-15% of turnover
- Employees: 79 on average (most < 50 people)
- Working effort: 1,990 h/year/person
- 73% receive or have received funds (grants, loans, tax reduction) from governments

Key partners

- 27% of their strategic partnerships and agreements are with associations.
- 76% share resources with other farmers and producers.
- 50% have a relationship with other SFSC initiatives.
- 50% have a relationship with social and cultural associations.
- 76% have a strong connection with public authorities, administrations, and governments.

General characteristics of the market and customers

- Sales at provincial-regional level (1,000-10,000 km^2).
- Customers mainly in urban areas (70% of the total).
- 76% employ at least 4 sales channels.
- The main sales channels are speciality retailers, own shops, door-to-door deliveries (by phone, email, website), local markets and restaurants.
- The most significant marketing and communication tools are websites and social media.
- 75% of cases have noted an increase in competition in the last 3 years (2016-2018).
- 56% of farmers and producers have 'price' competitors.
- 77% have 'value' competitors.

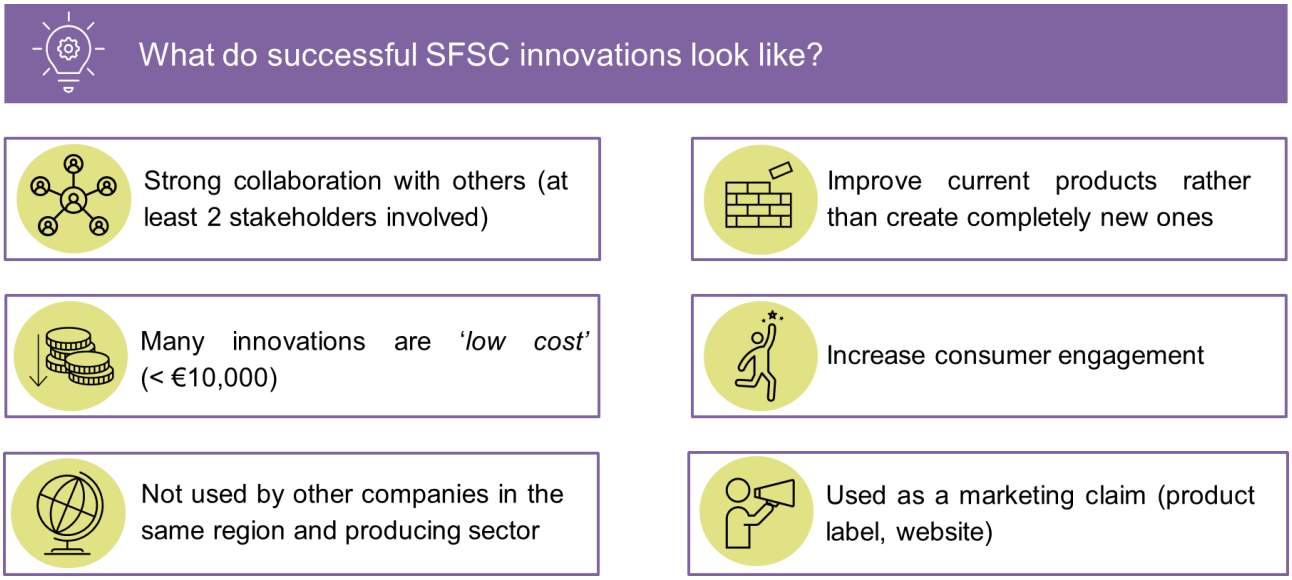
General characteristics of the foods produced

- They mainly deliver raw products (56%) rather than processed food.
- The most common foods are vegetables and fruit.
- > 50% of them commercialise organic food.
- 64% use quality labels/seals (mainly EU organic food, Protected Geographical Indication (PGI) and national/regional ones regulated by national/regional authorities).
- 82% indicate at least one marketing claim in their labels.
- The most used marketing claims are associated to the clean label concept (no additives, natural, free of chemicals) and to the local and traditional characteristics of the respective food (local product, traditional product, food produced in the region).

Cost structure

- The most significant expenditure item is materials (57% of average total cost), followed by labour (19%) and building, infrastructure and machinery (10%).
- 50% of the case studies invest in marketing (2% of average total cost), 27% in quality labels (< 1% of average total cost) and only 9% in research and development (<1% of average total cost).

General characteristics of a successful innovation



The involvement of stakeholders is essential for innovation to be successfully implemented and sustainable. In average, **at least 2 stakeholders** were involved in the studied innovations of SMARTCHAIN. Stakeholder cooperation facilitates innovation in SFSCs in at least two ways: it reduces the costs of implementing innovations that promote value creation in the supply chain, and it provides relevant know-how for the implementation.

An innovation is not necessarily be associated to a high cost and an entirely new idea. **Innovative actions can have a relatively low cost and be new just for the organisation that implement them**. Indeed, a large part of the innovations in SFSCs derive from the **inclusion of innovations successfully implemented in other fields or other geographical areas**. An example of this is the rapid development of digital technologies, widely used businesses with a more complex organisational structure and in technological applications; they provide a range of new enabling functions and solutions which can be adapted to SFSCs. According to the SMARTCHAIN results, more than 90% of innovations in SFSCs are used by others in other countries or in other regions (of the home country).

Innovation sometimes consists of refining or improving processes or products (incremental innovation); sometimes the change is major, disruptive, and may completely reshape or redefine the way something is done (radical innovation). Incremental innovations tend to be dismissed and much greater value is put on (potentially) breakthrough innovations. However, innovations that may not be technologically significant enough to attract global attention can still be very important from an economic standpoint. Indeed, according to SAMARTCHAIN, **two thirds of the innovations applied in SFSCs are incremental**.

As explored in SMARTCHAIN, consumers generally have little understanding of SFSCs. In some countries, SFSCs have significant problems connecting with consumers. As in any business, the way to long-term sustainability is finding the right customers who value the product and are willing to pay. Thus, a relevant number of the innovations studied in SMARTCHAIN improve **consumer engagement**, for example, by facilitating purchases, improving the connection with them, promoting social events or involving them in the production process. Consumer-related innovations are commonly associated to successful SFSC initiatives: **in successful SFSCs, consumers are often at the heart of the business**.

Finally, innovation applied successfully is commonly used as a **marketing claim** by the organisation. This means that SFSC initiatives use the applied innovation as a marketing tool: highlighting it on the label and/or

on the website, using it as a key part of the respective value proposition and employing it as a sales argument when talking with restaurants, specialty retailers or catering services.

6 general best practices for implementing innovation

Collaboration is key. Stakeholders are commonly involved in the innovative solutions successfully applied in SFSCs. SFSC initiatives are characterised by a low number of employees and low human, technical and economic resources. If an SFSC initiative aims to resolve any problem or improve performance through innovation, a clear recommendation is to contact the stakeholders that have the required knowledge/experience/resource that is not present in the organisation. The process is easier when the SFSC initiative has built up a multidisciplinary network of contacts since it was established.

Sometimes **innovations with 'low cost' can make the difference**. SFSC practitioners commonly associate innovation with a ground-breaking and 'high-cost' solution. However, innovation is not always related to such a solution: the problem can sometimes be easily resolved by applying a simple innovation with a relative low cost. Furthermore, considering the commonly low financial resources of SFSC initiatives, the application of a high-cost innovation can be very difficult. It may completely revolutionise the way of producing or selling and provide a clear competitive advantage, but the risk of failure can be very high. Thus, in the SFSC context it is usually better to move the focus to 'low-cost' innovation, resolving problems and improving products and services step by step. It is less risky and the SFSC practitioners can learn during the process: **innovation must be considered as a continuous process**.

Seek innovations that work in organisations from other regions, countries or sectors. If a problem has already been resolved there is no need to waste time developing a completely new solution. There are problems that are common to the companies from other sectors, regions or countries. Investigating how they deal with these common problems can be a good and quick way to find an innovative solution or obtain inspiration. Of course, if the applied solution is industrially protected by a patent or a similar method, it is first necessary to contact the owner to apply for a use permit or patent licence. Related to the first recommendation (collaboration is key), a good network of contacts from different regions of the country, or even from other countries, can be a catalyst to accelerate the process.

Prioritise innovations that really add value to your products and services, **innovations than can differentiate your company from your competitors**. Independently of production sector, a company always has different problems or points for improvement, which can be resolved by different innovative solutions. Sometimes, those problems/points of improvement may be associated to organisational or internal topics not directly linked to food quality or how sales are made. Due to the SFSCs' low resources, it is recommended that priority be given to the application of innovations which can be directly associated to improvements in food quality, sales price, value proposition and the relationship with consumers and/or which can be positively valued by customers. They can clearly differentiate the organisation from the competition.

Think of the consumers. Consumers are often neglected by small food companies. SFSC farmers and producers are normally centred on what they are experts in: to produce the best possible products in the best possible way. Thus, they normally think of innovation in terms of reducing production costs or improving food quality. However, as in all types of business, the customers, the consumers, must be the cornerstone. There are numerous examples of companies that produced the best products in their respective sectors but fell into crisis or even disappeared because they neglected the consumer relationship and marketing. A successful company pays attention to the consumers of its products and listens to them. Thus, a good recommendation for SFSC initiatives is to invest in innovations that improve the relationship with their consumers, enable the production of foods that are truly aligned with their necessities and facilitate consumer purchasing. **The closer the relationship with consumers**, **the easier it will be for them to value your products** over those of your competitors (even if they are more expensive) and **the easier it will be for them to become regular buyers** (an essential factor).

Take advantage of innovation for marketing. It is recommended that innovation be used as a marketing claim: it should be a crucial topic in the communication strategy of the SFSC initiative. In the 21st century, consumers have more shopping options than ever before, so it is essential to engage them using all available tools. **What is not communicated does not exist**. If a company does not communicate its innovations, how will the customer be able to value them? We live in an era in which the internet and social media have revolutionised social and business communication. Communicating and connecting with consumers has never been easier. A good recommendation is to communicate through **the company website and social media** that an innovation has been implemented, trying to indicate how it can be useful/interesting for consumers (new sales channel, new way of connecting with them, new format, new recipe, new packaging, increase shelf life, etc) and how it differentiates the company from the competition (the only company that applies it in the region, the first company that sells its products in the region through this sales channel, etc). Furthermore, **the products' packaging and labelling can also be used for communicating and marketing**: the key innovative features should also be highlighted here.

A step-by-step path to innovation

Based on SMARTCHAIN results, a methodology based on **a step-by-step path has been created to innovate in SFSCs**. The know-how of the authors, the bibliography, and the lessons learnt from the SMARTCHAIN case studies were also used as a source of information.

The idea of this methodology is **to guide and help the internal work that should be done by the farmer or small producer on the road to innovation**. It basically consists of 6 steps:

1) **Know your SFSC initiative;**
2) **Know your surroundings and your clients;**
3) **Identify your bottlenecks and success factors;**
4) **Seek and identify innovative solutions;**
5) **Select the innovative solution based on cost-benefit analysis;**
6) **Implement the innovative solution and go to market.**

Each step usually groups a set of questions (to be answered by the SFSC practitioner) and recommendations for taking each step (and preparing for the next ones) in the best way possible. In total, **more than 300 questions and more than 60 recommendations are provided**. These questions and recommendations aim to cover and highlight the most important **regional/local effects**, especially those associated to economic, environmental, legal-governance and socio-cultural indicators, and **the role of the different stakeholders** of the value chain. In step 4 (seek and identify innovative solutions), **knowledge transfer recommendations** have been included not only to provide advice to SFSCs but also to try to improve communication and interaction between SFSC practitioners and stakeholders (e.g. research and technology providers).

Innovation is always associated to a non-negligible risk of error, especially in the long term. The sustainability of the competitive advantage provided by an innovation is conditioned by multiple factors (consistency with the company's long-term objectives, expense forecasts, tolerance of failure, favourability of the situation, professionalised human team with permanent training, market trends, competitors' behaviour, supporting stakeholders, etc). Following the SMARTCHAIN step-by-step path will not assure that the innovation will be 100% successful in the short and long terms, though it will **increase the probability of fruitful innovation**, assuring that it is aligned with the problems, needs, markets, regional/local environment and business model of each SFSC practitioner.

Annex I

Best practice guide for the implementation of innovative solutions in SFSCs

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Abbreviations

AIDA	Awareness, Interest, Desire and Action
AFN	Alternative Food Networks
ARPU	Average Revenue Per User
ARR	Annual Returning Revenue
B2B	Business to Business
B2B2C	Business to Business to Consumers
B2C	Business to Consumers
COVID-19	Coronavirus Disease 2019
CSA	Community Supported Agriculture
EAFRD	European Agricultural Fund for Rural Development
EC	European Commission
ERDF	European Regional Development Fund
EU	European Union
Eurostat	European Statistical Office
F2F	Farm to Fork
GMO	Genetically Modified Organism
HACCP	Hazard Analysis Critical Control Points
HoReCa	Hotels, Restaurants, Catering
ICT	Information and Communications Technology
IPTS	Institute for Prospective Technological Studies
KPI	Key Performance Indicator
MRR	Monthly Returning Revenue
OECD	Organisation for Economic Co-operation and Development
PDO	Protected Designation of Origin
PGI	Protected Geographical Indication
R&D	Research & Development
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SFSC	Short Food Supply Chain
SIAT	Social Innovation Assessment Template
SMART	Specific, Measurable, Achievable, Realistic, and Timely
SME	Small-Medium Enterprise
SWOT	Strengths, Weaknesses, Opportunities and Threats
TSG	Traditional Speciality Guaranteed
UNIDO	United Nations Industrial Development Organisation
UTPD	Unfair Trading Practices Directive

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The authors are also grateful for the continued commitment of the managers of the 9 SMARTCHAIN Innovation Hubs. Without their intermediary work with the case studies, including the translation of documents, questionnaires and answers, this guide would not have been possible.

Background and objective of the guide

In recent centuries, and particularly since the second half of the 19th century, the agri-food system has been strongly driven by the paradigm of globalisation. It has accordingly evolved from a production and trade system primarily based on almost disconnected local economies to an interconnected and integrated global trade system. In an increasingly specialised and complex world, intermediaries, large corporations, and above all long food supply chains play a lead role. Indeed, today most of the EU population buys food from large supermarket chains. This has led not only to a loss of the connection between consumers and primary producers (consumers cannot track the food to a recognised producer or area) but also to concerns about transparency, environmental policy, workers' rights, rural development and food ethics, among others. Lastly, in the current agri-food sector characterised by long chains, small farmers, cooperatives, and other producers have little regular bargaining power and are left with a limited margin to stay competitive.

In the last two decades, alternative food supply initiatives and networks have blossomed across Europe and North America (Cicatiello, et al., 2015; Holloway and Kneafsey, 2004). Such experiences began in countries where problems associated to (1) industrialisation of agricultural processes, (2) continued abandonment of the countryside and (3) problems farmers faced when accessing prevalent sales channels emerged for the first time. Such initiatives (i.e., farmers' markets, farm shops, community supported agriculture, online shops) meant to reconnect producers and consumers have been labelled 'short food supply chains' (SFSCs). Often operating in urban and peri-urban settings, SFSCs respond to an increasing desire of urban consumers to access secure, high-quality and sustainable food, and to producers' need to capture a higher percentage of the added value. Since SFSCs respond to several needs and opportunities, for both of farmers and consumers, their promotion is one of the aims of the Common Agricultural Policy of the European Commission (EC) for localisation and re-localisation of food and agricultural systems to improve the competitiveness of farmers and small producers (Kneafsety et al., 2013). SFSCs may act as a driver of change and a model to increase transparency, trust, equity, and growth throughout the agri-food chain.

SFSCs enable experimenting with new forms of cooperation, sales, and marketing, which can be modulated with respect to the interests of producers and consumers and thereby have positive impacts for the local community, by shifting the centre of activity to the territory, quality of production and consumption processes as well as promoting a rural development model based on multifunctionality and sustainability. SFSCs are thus part of a virtuous local development cycle that involves or includes rural tourism, educational activities, market exploitation of typical products, onsite processing of agricultural products and other multiple opportunities linked to the productive, ecological, landscape, cultural, environmental and social function of agriculture and to diversification of activities as well as sources of income.

Despite their continuous development and the support of governments and authorities (from European to local level), SFSCs have faced difficulties that prevent or limit their success and progress. Some of these challenges can be resolved by applying **innovative solutions** already on the market, which could be tailored to meet the SFSCs' scale. However, small farmers and producers associated to SFSCs often do not have the resources (money, time, personal and knowledge) to find, apply, and adapt such innovations and, finally, to resolve those problems by themselves. Closing these gaps would actively contribute to transforming the SFSC into a concrete and sustainable alternative to the globalised food system.

In this context, the EU project **SMARTCHAIN** (https://www.smartchain-h2020.eu/) was launched in 2018 involving 43 partners from 9 EU and 2 associated countries, including key stakeholders from the realm of SFSCs as actors in the project. The aim of this collaborative and multi-actor project is to foster and accelerate the shift towards collaborative SFSCs and, through specific actions and recommendations, to introduce innovative practical solutions that enhance the competitiveness and sustainability of the European agri-food system. One of these specific actions is the current document, a **best practice guide to help small farmers and producers involved in SFSCs to implement innovative solutions**.

Primarily based on SMARTCHAIN findings, this guide presents relevant information, **successful cases of the innovation implementation in SFSCs**, a **specific set of recommendations** and **a methodology to facilitate not only the identification of problems and needs but also the search for and application of innovative solutions**. To carry out this work, a team of 17 experts from 6 European institutions (AZTI, Campden BRI Hungary, the Mediterranean Agronomic Institute of Bari, Organic Services, the University of Belgrade and the University of Torino) from Germany, Hungary, Italy, Serbia and Spain were involved. Furthermore, based on the SMARTCHAIN's multi-actor approach, 9 experts from AMPED, EUFIC, KIS, ISEKI, the University of Hohenheim and the University of Crete (Austria, Belgium, Germany, Greece, Hungary, and The Netherlands) revised this guide.

1. What is a short food supply chain?

1.1 Definition

Although the terminology SFSC itself is quite descriptive, it requires **further explanations as to what being 'short' entails**. There is currently no single official and universal conception of SFSCs (Chiffoleau and Dourian, 2020). There are currently various definitions, some of which are summarised below, concluding with a definition that has been agreed upon by the SMARTCHAIN project members.

One of the first definitions of SFSC was made by Marsden et al. (2000), who actually defined three different types of SFSCs:

a) face-to-face purchases with personal interaction (direct or even via the internet);
b) spatial proximity – where products are produced and sold within their own region of production while local consumers are made aware of the regional nature of the product at the point of sale;
c) spatially extended – where relevant information about the place of production and those producing the food is communicated to consumers outside of the region of production itself.

For Marsden et al. (2000), an SFSC is not defined by the number of times a product is handled or the distance over which it is ultimately transported. Instead, it is defined by the fact that the product reaches the consumer embedded with enough information to enable him to make connections and associations with the place of production, the values of the people involved, and the production methods employed. The international grassroot organisation Slow Food (2013) determined that within an SFSC, producers and end consumers realise that they share the same goals, which can be achieved by creating new opportunities that strengthen local food networks. Producers can thus regain an active role in the food systems, minimising the number of steps involved, the distance food travels and potential food losses. According to Regulation (EU) 1305/2013 (European Commission, 2013), SFSCs involve a limited number of economic operators, committed to co-operation, local economic development and close geographical and social relations between producers, processors and consumers. More recently, Chiffoleau et al. (2016) examined various aspects of SFSCs (Figure 1). The authors differentiated between direct selling and selling through a maximum of one intermediary.

Basically grounded on the definitions of Regulation (EU) No 1305/2013 (European Commission, 2013) and Chiffoleau et al. (2016), the **SMARCTHAIN partners agreed on an internal working definition**:

"Short food supply chains (SFSCs) are co-operative systems that include very few intermediaries, increasing sustainability, transparency, social relations and fairer prices for farmers and consumers. Such supply chains usually involve local producers working together to promote local food which, in many cases, only travels a short distance, so farmers and consumers can communicate with each other."

The SMARTCHAIN definition is interpreted in such a way, that a local food manufacturer who is a part of a local community is counted as the last step of food production in the SFSC and not as an intermediary.

Figure 1. Example of the diversity of SFSCs. Adapted from Chiffoleau et al. (2016).

1.2 Key aspects

SFSCs entail many **social, economic, and environmental benefits** (Table 1) and thereby address both major goals by the European Union[1] and many of the Sustainable Development Goals of the United Nations[2]. On a European level, SFSCs especially work in favour of two top-priority concepts of the European Commission for 2019-2024: "A European Green Deal"[3] and "An Economy that works for the people"[4].

Many SFSCs that already exist today are based on organic production. Organic production worldwide is regulated by authorities and private standard-setters, and all parties of organic supply chains are certified by independent certification bodies. This creates much-needed trust for organic consumers, who are usually very interested in where their food comes from and how it was produced. Since organic products sell for higher prices than conventional ones, sales strategies often require a higher level of transparency and greater communication efforts which effectively convey the added value. This works especially well within SFSCs and for many years has revived direct marketing strategies for organic products. The result is a wide variety of local business models, many of them cooperative. The relationship of trust between consumers and producers is crucial for guaranteeing food authenticity and integrity in many SFSCs. Despite that, it is important to point out that any food supply chain, whether short or long, organic or conventional, should be backed up by anti-fraud systems and regulations which go beyond mere marketing level and offer credible proof of product integrity and authenticity.

[1] Goals and values of the EU. https://europa.eu/european-union/about-eu/eu-in-brief_en#goals-and-values-of-the-eu
[2] Sustainable Development Goals of the the United Nations. https://sdgs.un.org/goals
[3] European Comission. Priorities 2019-2024. A European Green Deal. Striving to be the first climate-neutral continent. https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en
[4] European Comission. Priorities 2019-2024. An economy that works for people. Working for social fairness and prosperity. https://ec.europa.eu/info/strategy/priorities-2019-2024/economy-works-people_en

Table 1. Main social, economic, and environmental benefits of SFSCs, considering goals and priorities of the European Commission and the United Nations[1,2].

Social benefits
• Enable relationships and cooperation between local farmers, producers, and consumers to thrive. • Strengthen trust and cohesion within local communities, thereby stimulating social progress. • Create jobs in rural areas and reinforce local food sovereignty; SFSCs improve the well-being of local citizens of all ages. • By reducing the number of the participants of the supply chains to as few as possible, they enable fairer prices for farmers and consumers.
Economic benefits
• Ensure sustainable, balanced economic growth with price stability and the creation of jobs in rural areas. • Include only a few local intermediaries; SFSCs are more resilient to international crises such as SARS-CoV-2 pandemic (no international trade, no long transport). • Allow for fast innovations that thrive through uncomplicated community-based initiatives. • Reduce transport costs and keep the value chain local. • Strengthen micro, small and medium-sized enterprises, thereby opposing the oligopolies of the food system (e.g. the existence of a small number of buyers-wholesalers and large number of farmers).
Environmental benefits
• Avoid long supply chains in which goods travel for long distances; SFSCs can reduce CO^2 emissions due to transport, storage, cooling, and packaging. • Increase the bonds between local consumers and producers; SFSCs have the potential to raise the local population's awareness about more sustainable food production practices. Local people may consequently vote for a greener, more sustainable policies.

2. Short food supply chain in Europe: an overview

2.1 What are SMARTCHAIN short food supply chain initiatives like?

In the SMARTCHAIN project **18 different case studies from 9 different European countries** (France, Germany, Greece, Hungary, Italy, the Netherlands, Serbia, Spain and Switzerland) were examined from a business standpoint, collecting answers to more than 40 questions (including economic data from 2015-2018). Although 18 is a low number to capture the diversity of the European SFSC ecosystem, the dedicated selection of representative widespread short chains including all types of SFSC initiatives (cooperatives, individual direct sales, etc), the quality of the collected data and the lack of similar studies justify the suitability and relevance of the work carried out.[5] The information gathered was grouped and analysed regarding 5 different aspects: (1) organisational and economical characteristics, (2) key partners, (3) general characteristics of the market and customers, (4) general characteristics of the foods produced, and (5) cost structure. Table 2 shows the main results of this analysis. Due to the low number of cases studies, the information presented should be treated with caution. As a summary of this work, Figure 2 shows the 7 most common and relevant characteristics of the studied SFSCs.

[5] According to "Short Food Supply Chains and Local Food Systems. A state of play of their socio-economic characteristics", there is limited economic data on SFSCs. https://publications.jrc.ec.europa.eu/repository/handle/JRC80420

Table 2. Main findings of the analysis of business-related information from the 18 SMARTCHAIN case studies (period analysed: 2015-2018).

Organisational and economic characteristics
• SMEs, typically micro and small enterprises • Turnover: < €10 m (normally €0.1-0.5 m) • Profit: 5-15% of turnover • Employees: 79 on average (most < 50 people) • Working effort: 1,990 h/year/person • 73% receive or have received funds (grants, loans, tax reduction) from governments
Key partners
• 27% of their strategic partnerships and agreements are with associations. • 76% share resources with other farmers and producers. • 50% have a relationship with other SFSC initiatives. • 50% have a relationship with social and cultural associations. • 76% have a strong connection with public authorities, administrations, and governments.
General characteristics of the market and customers
• Sales at provincial-regional level (1,000-10,000 km^2). • Customers mainly in urban areas (70% of the total). • 76% employ at least 4 sales channels. • The main sales channels are speciality retailers, own shops, door-to-door deliveries (by phone, email, website), local markets and restaurants. • The most significant marketing and communication tools are websites and social media. • 75% of cases have noted an increase in competition in the last 3 years (2016-2018). • 56% of farmers and producers have 'price' competitors. • 77% have 'value' competitors.
General characteristics of the foods produced
• They mainly deliver raw products (56%) rather than processed food. • The most common foods are vegetables and fruit. • > 50% of them commercialise organic food. • 64% use quality labels/seals (mainly EU organic food, Protected Geographical Indication (PGI) and national/regional ones regulated by national/regional authorities). • 82% indicate at least one marketing claim in their labels. • The most used marketing claims are associated to the clean label concept (no additives, natural, free of chemicals) and to the local and traditional characteristics of the respective food (local product, traditional product, food produced in the region).
Cost structure
• The most significant expenditure item is materials (57% of average total cost), followed by labour (19%) and building, infrastructure and machinery (10%). • 50% of the case studies invest in marketing (2% of average total cost), 27% in quality labels (< 1% of average total cost) and only 9% in research and development (<1% of average total cost).

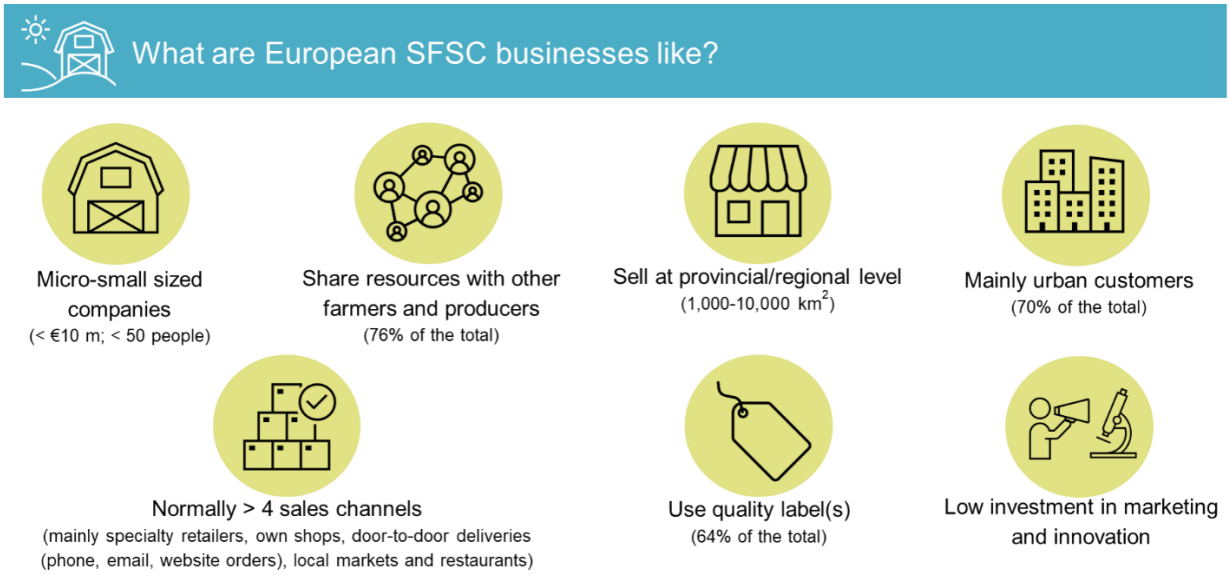


Figure 2. General characteristics of the European SFSC initiatives studied in SMARTCHAIN (18 case studies).

Organisational and economic characteristics

The SFSC environment is complex and very rich in all aspects, including those associated to company organisation. Some companies produce and/or process foods with a high level of internal organisation (fully equipped financial and marketing departments) and business professionalism (accounting software, long-term business strategy); they use SFSCs, although their main business field involves the conventional long chain (food supplied by large retailers). Also to be found are very small enterprises basically comprising a single farmer (one-man orchestra) or a small group of them; they only use SFSCs and try to compete against long chains in a hostile environment. Between those extremes, all kinds of transitional business categories can be discerned, including community-supported agriculture, farmer cooperatives, and small food processors.

From a business size perspective, **SFSC initiatives are usually micro** (turnover ≤ €2 m; workers <10) **and small enterprises** (≤ €10 m; < 50)[6]. Most of SMARCTHAIN case studies thus have turnover of less than €10 m (usually ranging between €0.1 m and €0.5 m) and employ less than 50 people (1,990 h/year/worker). The profit of these food companies (turnover minus expenses) corresponds to 5-15% of the turnover.

SFSCs are usually supported by governments, administrations, and municipalities as a key strategy for promoting rural development. For example, irrespective of regardless the SMARTCHAIN grant, 73% of the project case studies receive or have received direct (grants, loans) or indirect (tax reductions) financial support from governments and administrations. The source of these funds is mainly national (52%), regional (20%) and European (12%). However, it should be noted that a large part of the national and regional funding probably comes from the EU by, among others, the European Regional Development Fund (ERDF).

Key partners

Collaboration is essential in SFSCs. The 18 cases analysed have a median of 2 signed or other formal strategic partnerships and agreements (collaborations, alliances, joint-venture initiatives): 27% of those

[6] Small and medium-sized enterprises (SMEs) definition based on EU recommendation 2003/361 (https://ec.europa.eu/growth/smes/sme-definition_en)

partnerships are associations, 24% are buyers and 18% are suppliers. It can therefore be inferred that **SFSC initiatives put at least as much effort into working with others** (27% of the agreements) **as they do into signing agreements with buyers** (24% of the agreements).

Beyond the formal agreements, **SFSCs are collaborative and open initiatives,** and are rooted in their surrounding social framework. Thus, 94% of them have relationships with other farmers and small producers, and 76% even share resources among them (machinery, storage facilities, etc). In addition to their participation in SMARTCHAIN, approximately 50% of the examined SFSCs have relationships with other projects and initiatives associated to SFSCs. Furthermore, 50% of them have relationships with social, cultural, and environmental associations and initiatives situated in their regions. They are not directly related to the SFSCs themselves but are indirectly empowering some aspects of SFSCs (local food, local tourism, traditional habits and practices, social events, protecting the environment, etc).

With respect to public authorities, administrations and governments, 76% of the cases have a strong connection with these. Overall, 77% of the connections are with local (42%) and regional (35%) public authorities, while only 23% with national ones. Hence, the local and regional aspect of SFSCs is also represented in their **relationship with public authorities and governments**.

In conclusion, **the community component and strong social and local roots are clearly a differentiating feature** which must always to be considered to truly understand SFSCs.

General characteristics of the market and customers

Only 30% of the European SFSC users are in rural areas. This is not surprising, since according to Eurostat only 27.8% of Europeans live in rural areas (thinly populated areas) (Eurostat, 2015). Thus, **SFSC users are mainly located in urban areas** (cities and surrounding areas), although **SFSC initiatives are commonly located outside cities**. From a geographical standpoint, SFSC initiatives act at **the provincial/regional level (1,000-10,000 km^2)**. In SMARTCHAIN, 52% of the organisations operate only at the province-regional level, 44% at national level and only 4% export some products to international markets.

With resect of sales channels, the situation in SFSCs is more complex that in conventional long food supply chains. In the latter, sales are mainly made through only one channel: the conventional large retailers (offline or online). However, in SFSCs various sales channels can be found (physical shop, cooperative shop, online shop, in-farm sales, online marketplace, door-to-door deliveries (phone, email, website orders), local markets, specialty retailers, consumer groups, restaurants, pick-your-own, community-supported agriculture (CSA), fairs and events, etc). The SMARCTHAIN findings indicate that 76% of SFSC initiatives **use at least 4 sales channels**. The most used ones are specialty retailers, own shops, door-to-door deliveries (phone, email, website), local markets and restaurants. These five are also the most important ones in terms of sales. While **the most expensive sales channels are online shops sand the door-to-door deliveries** (high sales but with 'high' effort, due to numerous small orders); **the least expensive ones are specialty retailers and restaurants** (high sales with 'low' effort, due to constant and similar large orders over time).

The most used and significant marketing and communication tools are **companies' websites and social media**. Apart from those two, the role of paper advertising (printed material, flyers, brochures, advertisements in a local newspaper), word-of-mouth (farmers' social network), attendance of fairs/events and the organisation of promotional events is not negligible. At least 3 different marketing and communication tools are usually applied at the same time to maximise impact.

Competition is a hard topic for SFSC initiatives, not only with conventional long food supply chains but also with other SFSCs. Indeed, 75% of the cases noted an increase in competition in the last

3 years (2016-2018). It has been seen that 56% of farmers and producers have 'price' competitors, while 77% have 'value' competitors.

General characteristics of the foods produced

The 18 SFSCs analysed mainly deliver **raw products** (56%) rather than processed food. In order of importance, the most common foods are vegetables, fruits, dairy products and, finally, meat. More than 50% evidently commercialise organic food (32% produce exclusively organic food).

In 64% of the cases **quality labels/seals are used**. Those most used are **EU organic food, Protected Geographical Indication (PGI) and national/regional ones** regulated by national/regional authorities. Usually 2 labels are applied, combining an EU organic label and a national/regional label.

It was observed that 82% of the cases studied apply at least one marketing claim on their labels to highlight their main values. In order of importance, those most used are associated to the **clean label concept** (no additives, natural, free of chemicals, non-GMO) and to **local and traditional characteristics** of the foods (local product, traditional product, food produced in the region, family recipe). Claims associated to **environmental and social sustainability** are also typically used (environment friendly, chemical-free production, low carbon footprint, social claim, free-range, compostable packaging, children's education).

Cost structure

According to information collected from the 18 SFSC initiatives of the SMARTCHIAN project, **the most significant expenditure item is materials** (57% of total average cost), followed by labour (19%) and building infrastructure and machinery (10%). Specifically, 50% of the case studies invest in marketing (2% of average total cost), 27% in quality labels (< 1% of average total cost) and 9% in research and development (<1% of average total cost). From this analysis it can be inferred that once current costs associated to food production and sales are covered, **SFSC initiatives invest primarily in marketing. In case they have additional resources, they then invest them in quality labels and research and development** to improve their products' values and differentiate them from the competition.

2.2 Main types of initiatives

In most cases, the great diversity of forms, motivations and practices of shortened supply chains arise in response to dissatisfaction with an industrial distribution system which in many respects has disappointed the expectations of consumers and producers (Holloway and Kneafsey, 2004; Raffaelli et. al., 2009; Sonnino and Marsden, 2006). The main objective of SFSCs is thus the common interest in **closer relationships between consumers and food supply chain actors**[7].

Numerous studies have investigated in the northern European and North American contexts the most widespread forms of short supply chain: direct sales on farm, farmers' markets, weekly deliveries to households, collection of products on the field by consumers ('pick-your-own'), e-commerce and different ways of association between producers and consumers, from the most intense forms that provide a real sharing of business risk to the 'softer' ones that provide for the adoption of livestock.

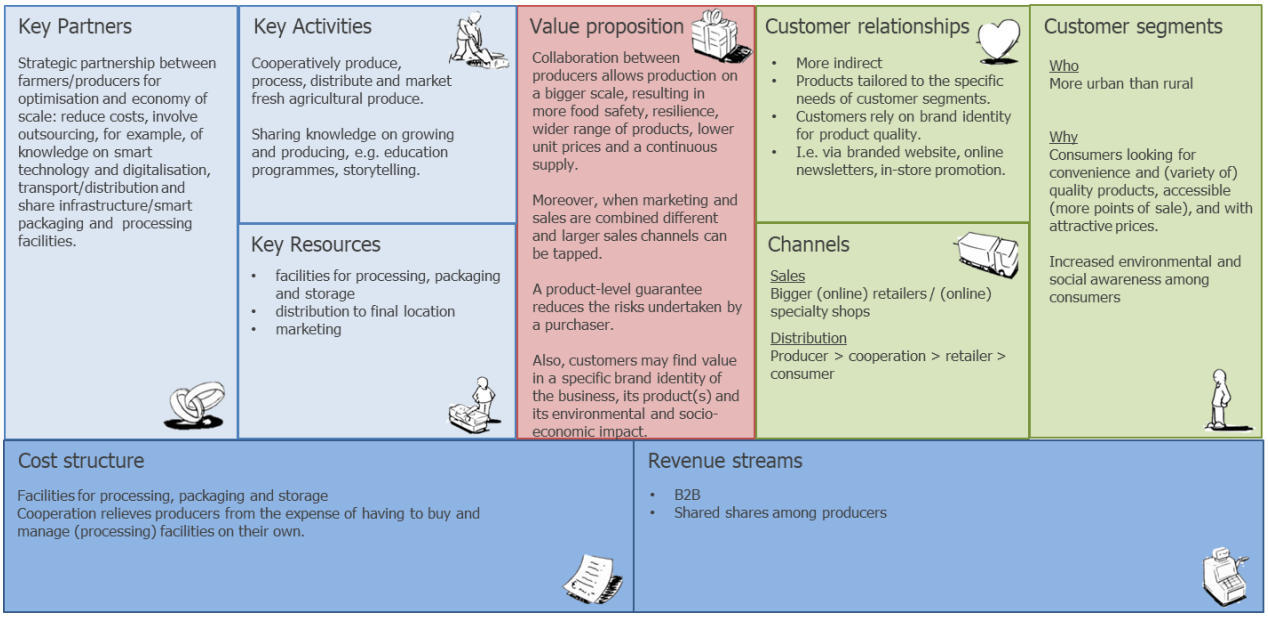
[7] Foodlinks FP7 project. https://www.foodlinkscommunity.net/

SFSCs can be divided into two overarching types: 'traditional' and 'neo-traditional' and 'modern'. Moreover, a recent report by the United Nations Industrial Development Organisation (UNIDO, 2020) proposed six broad types of SFSCs: on-farm selling, farmers' markets, farmers' shops and box schemes, consumer-driven initiatives, public (collective) procurement, and hotels, restaurants, and catering. These six categories do not capture the huge diversity of existing SFSCs but do help highlight two types of SFSCs that are significantly more present in current literature: farmers' markets and consumer-driven initiatives (especially community-supported agriculture). On-farm selling would therefore be considered traditional SFSCs, box schemes and consumer-driven initiatives would be considered more modern forms of SFSCs. Farmers' markets are considered 'neo-traditional' in some countries, and 'modern' in others.

In the SMARTCHAIN project 5 general SFSC archetypes have been establish: **cooperative of producers, individual producers, community supported agriculture, online and offline marketplace, and promotion of on-farm selling**[8]. They were characterised using a business canvas model (Osterwalder and Pigneurr, 2010). Their main characteristics are detailed below.

Cooperative of producers

A cooperative of producers allows its members, who produce the same or similar products, to cooperatively produce, process, distribute, market and sell the products. Typically, this model is chosen when production and processing are relatively expensive and can be hard for and individual to afford (high cost means high sale price, making it difficult to compete in the global market). Also, when marketing and sales are combined, it is possible to develop more and different sales channels.

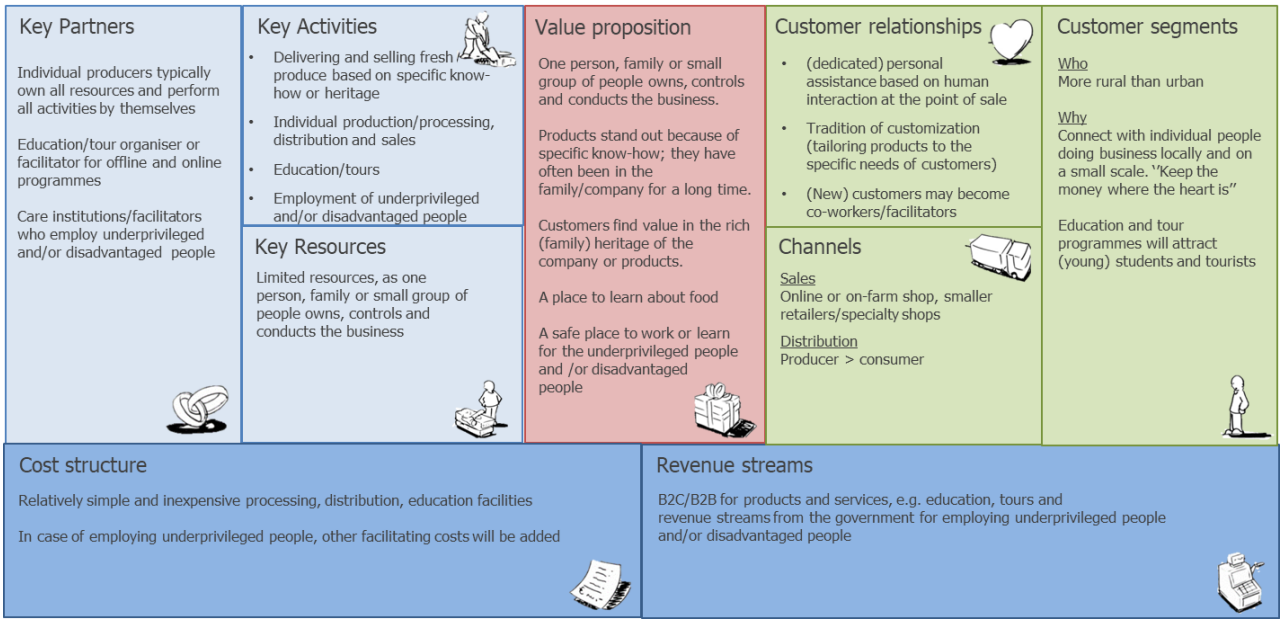


Individual producers

Many farms operate as individually owned businesses, probably the oldest and most common form. One person, family or small group of people owns, controls and conducts the business. Individual producers

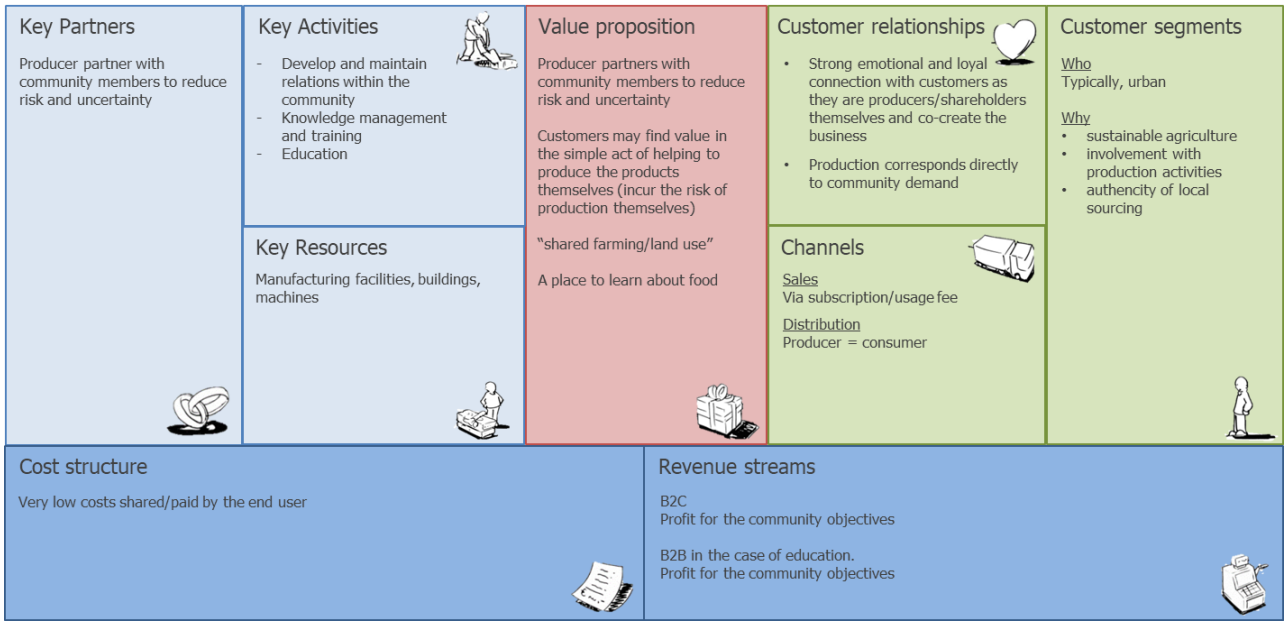
[8] For detailed models, please refer to Deliverable 7.2 of the SMARTCHAIN project.

typically have a rich (family) heritage; relatively simple (inexpensive) processing or distribution is required. Sales channels are typically an online or onsite farm shop.



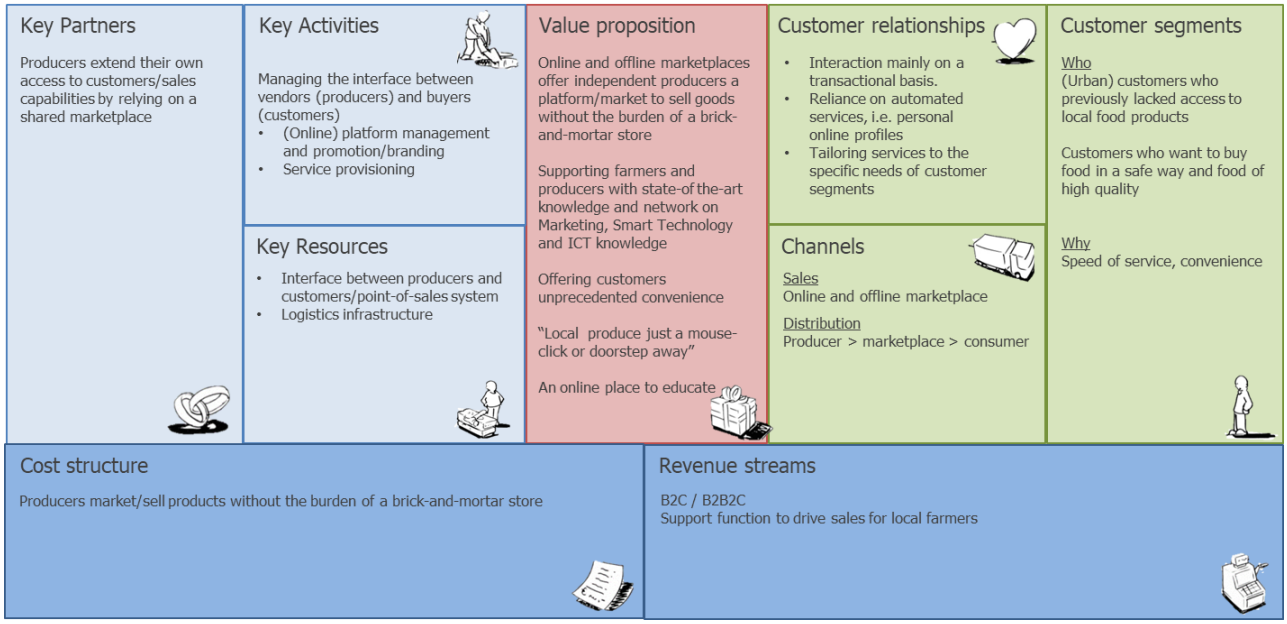
Community-supported agriculture

The community-supported agriculture (CSA) model has been in place at many farms for some time. It is practiced by a relatively low number of farms but in recent years has gained traction. The traditional model placed substantial emphasis on sustainable agriculture, shared production risk, consumer involvement with production activities and authenticity due to local sourcing. Over the years, different types of CSA have evolved: the subscription model (subscription-based contract for a defined quantity of produce from the land), the shareholder model (buy shares and produce from the land) and the community model (invest and operate farm/land and share produce with the community).



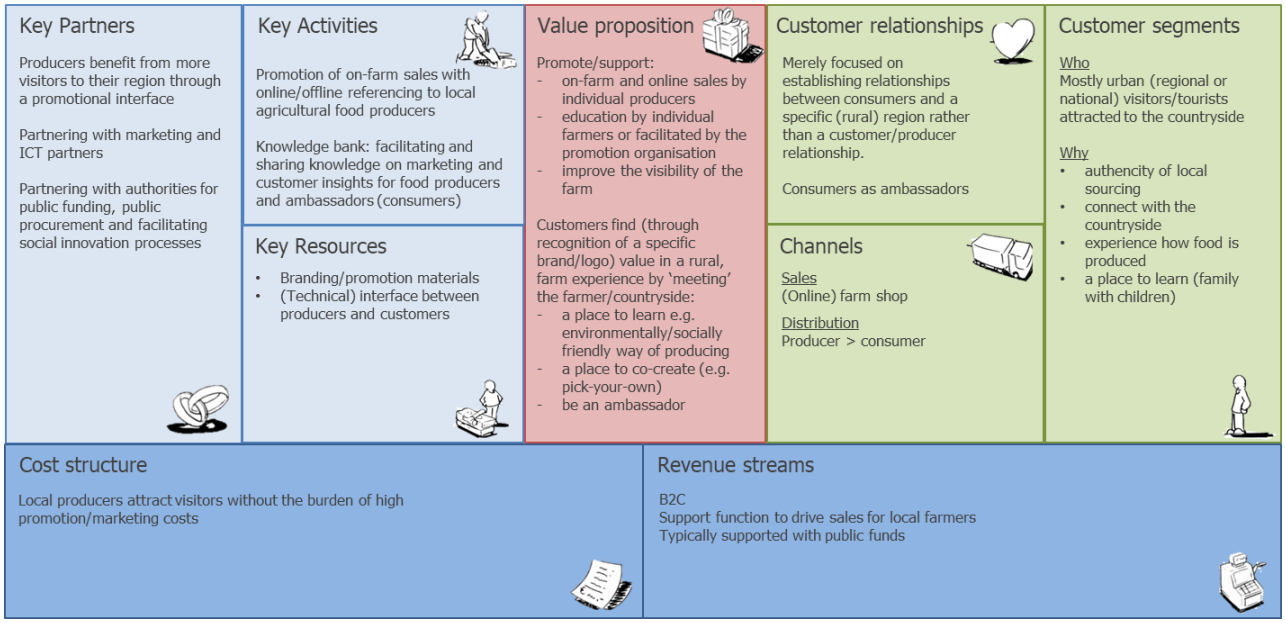
Online and offline marketplace

Online retail continues to grow rapidly, especially during the SARS-CoV-2 pandemic, although online marketplaces in fresh food are still significantly behind general retail. However, some promising traction for SFSCs has been observed. The online benefits of selling local products 24/7 to an increasing group of potential customers who buy online are evident. Marketplaces offer producers a platform to sell goods without the burden of a brick store.



Promotion of on-farm selling

This model has the primary aim to promote/support on-farm (and online) sales of individual producers and to improve the farm's visibility. It is conducted at local as well as at regional and national level. These organisations are typically supported by public funds.



2.3 Consumer profile and respective expectations

Consumers must be considered the cornerstone of SFSCs. The success of any food initiative is always about offering consumers the products they need in the way that they need. In the SMARTCHAIN approach, the attitudes and expectations the consumers regarding SFSC foods were studied[9]. The main results are summarised in this section.

Consumers are generally aware of the **impact of food production**; there is more awareness about environmental issues than about social impact, which is still low. It was suggested that the reasons are that the environmental impact is universally accepted and has a direct cause and effect relationship while social impact can vary greatly. It may thus be hard for consumers to receive clear and consistent messages about the social impact. Consumers also appeared to have a simplified version of the stories they have heard. Very few make the extra effort to search for the details behind them. Generally, **from them the easier the concept is to understand, the greater their awareness**.

Consumers generally have little understanding about SFSCs. They usually link it to the concept of local food. This concept of local is associated to region or nation, rather than geographical distance, which is relative and depends on where the consumer lives. It can be perceived as meaning food from one's own country, region or even village. They **associate local to product origin**, though there are some differences regarding the aspect concerned: for some, it applies to the origin of the main ingredient; others believe that the place of processing defines whether a product is local or not; for others, it is enough if the products sold are not produced elsewhere.

Some consumers identify the concept of local with direct connection to the producer, with small-scale production or with traditional specialities.

There is usually **a positive attitude regarding local food**, even though consumers are sometimes confused about what exactly is the benefit of it. They are unaware that local does not necessarily mean more natural or environmentally friendly. They associate it to concepts such as organic or 0 KM (food that travels zero km between production and consumption), etc.

Consumers would like to have the same services from SFSCs as what they receive from long chains. This expectation is becoming more realistic, yet consumers would still like to have a **wide variety of products at a single selling point**, presented in the same way as in supermarkets, supplied all year round and with comparable prices. Buying from an SFSC implies a limited range of products from a specific place, such as a farm or collection point, and this may be considered an obstacle.

Another issue is that **consumers perceive products from long chains as being more reliable because they have been controlled and certified at checkpoints**. The limited information in SFSCs presents an obstacle, particularly for the hospitality industry (hotels, restaurants, etc) who are legally bound to comply with food safety standards. Having a direct connection to the producer can increase trust, although in some cases this is not enough to develop the same confidence in hygiene and food safety standards that are taken for granted in the longer food chains. Moreover, some consumers are also concerned about product authenticity/origin. **Specific SFSC regulations and certifications can help address such issues**.

Even though the demand for SFSC products is increasing, it is still a **niche market**. More research is needed to estimate how the demand is being met. It was suggested that **in some countries and for some products and regions, the demand exceeds the supply**. But **in some countries such as Greece, Hungary and Spain, most consumers do not want to pay more to buy from an SFSC than from the supermarket, although this can vary depending on the type of product.**

[9] For more details, please refer to Deliverable 4.2 of the SMARTCHAIN project.

Consumer demand is driven by the market offering and it is higher in more populated and tourist areas. Having more points of sale is expected to increase consumer demand. Also, offering something different plays an important role: there is more interest in **regional specialties and quality 'gourmet' products**. **The consumer is willing to pay more for organic products and for those with better taste, quality, and health benefits**, particularly if associated to awards/certification, as well as when they know that the farmer's livelihood is improved through the SFSC. **Knowing who the producer is, and the story behind their product, help win consumers' trust**.

Consumers' motivation to buy SFSC products is driven by concern about the environment and health, preference for traditional products and willingness to support the local community. Buying from a SFSC require more time, money, and effort and thus most consumers do not buy from SFSCs, even though they may intend to do so. **Consumers with more time and money are more likely to purchase SFSC products**. Also, it appears that **consumers with higher socio-economic status are more open to SFSCs**.

There is variability among the countries studied. However, the estimated number of **consumers who regularly purchase local food was between 1% and 10%.** The main groups of consumers who buy SFSC products are **people who believe in SFSCs** (a very small group); **middle-class families with young children** who have financial means and are concerned about health and the environment; and **elderly people** who like to buy traditional products and have the habit/time to buy directly from producers. Another group seeking SFSC products comprises **tourists** looking for high-quality products to take back home.

To increase consumer purchases of SFSCs, the **marketing and communication strategies** should indicate the social impact of food production at local level to increase the sense of personal relevance for consumers. It should also address consumer expectations regarding the food range and seasonality of the products.

Governments at all levels play an important role in communication. Nevertheless, producers should be able to conduct their own market research and identify the relevant target groups, as different products in different regions attract different consumers. Consumers concern about transparency should be met by providing information about the origin, production, and processing methods; others will be more engaged by using a storytelling approach emphasising how produces overcome obstacles to reach their goal.

2.4 Differences among countries and regions

The territorial dimension of food production and consumption is at the centre of rediscovery which, although in different forms, concerns both northern and continental realities, as well as those of Mediterranean Europe, besides touching on the processes of rural development.

Indeed, **SFSCs have followed different courses in developed countries**. In Mediterranean European countries (France, Italy, Spain, Greece, Portugal, etc), 'neo-traditional' farmers' markets developed in the 1980s alongside traditional open-air markets, mixing producers directly selling their products and reselling other products with retailers selling products in short and/or long chains. In Anglo-Saxon countries (UK, USA, Canada), farmers' markets appeared earlier, in the 1970s, but are still considered 'modern' as there was no tradition of open-air markets in those countries. Inspired by the *teikei* system invented in Japan in the 1960s, community-supported agriculture (CSA) emerged in the 1970s in North America and later in Mediterranean countries, and on both continents embodied a form of resistance against the industrial food system and is hence often referred to as an 'alternative food network' (AFN). In Eastern European countries (Hungary, Poland, Czech Republic, etc), farmers' markets and CSA emerged alongside already-present non–market-based food self-provisioning practices (here including home gardens and community gardens), which still play a fundamental socio-economic role at individual and community levels. In Scandinavian countries, the literature

has otherwise documented the emergence of a culinary 'specialty food' movement relying on local supply networks, thus implicitly embedding SFSCs.

In general, there is little evidence of quantitative data on the different forms of short chains. The information we have collected is from case studies and specific survey linked to projects. In almost every country, the approach to knowledge about SFSCs was mainly through specific surveys in local contexts.

In some countries such as Italy or Spain, e-commerce and catalogue sales are not widespread. Only packageable and non-perishable products with constant quality and low frequency of purchase, such as oil, wine or jams, are normally found in these sales channels. The other most common forms of the short supply chain occur in a local context, where one can choose, evaluate and buy typical products, fresh, ripe and seasonal, maintaining unaltered organoleptic and nutritional properties, at lower costs than via traditional channels (Baldi et al., 2019; Hunt, 2007; Knickel and Renting, 2000; Taylor et al., 2005): from direct sales on-farm to farmers' markets; from weekly deliveries on subscription to households ('box schemes') to sales through solidarity buying groups and organised distribution groups; from harvesting products directly from the fields ('pick-your-own') to raw milk distributors; from supplies to the HoReCa (hotels, restaurants, catering) circuit to consumer cooperatives up to new ways of association between producers and consumers (CSA).

In research conducted by the European Commission (EC) in 2013[10], a database was compiled on 84 case studies across Europe. It emerged that there is a large variety of types of SFSCs throughout the EU and nearly each type is present in every part of the EU. In general, the impression is that collective schemes supplying public institutions seem less developed than other types of schemes and that **CSAs** (as well as 'neo-traditional' schemes) **are less present in new member states and Mediterranean areas than in north-western Europe** (UK, France, Belgium in particular). **The 'traditional' on-farm schemes are more represented in Mediterranean countries and in new member states**, where off-farm 'traditional' types such as farmers' markets are also dominant.

Concerning the **economics of the schemes**, the EC survey points out that many schemes operate with membership fees for producers and/or consumers and with public support from EU rural development schemes and national or regional extra subsidies. There is more information on the size and structure of SFSCs: it seems that there are, on the one hand, many small schemes (with less than 10 producers involved and less than 10 employees and/or volunteer workers) and, on the other hand, a few large schemes involving many farmers (over 100) and employees, particularly present in the north-western Europe. The SMARTCHAIN sample once again confirms this trend: the average number of **members (farmers and employees**) for the entire sample is 79 (see section 2.1). But if we consider only **northern European countries** (Germany, the Netherlands and Switzerland), **the average number of members rises to 100**; when considering only **Mediterranean European countries** (France, Greece, Italy, and Spain), **it decreases to 8**.

Most of the schemes implement full or partial **organic farming** practices. However, **certified organic farming is less present in the examples identified in the new member states than in the rest of Europe**. In the SMARTCHAIN case studies sample, 62% of the organisations operating only as SFSCs practice **organic production, more in the Mediterranean countries** (75%) **than in the Northern European ones** (63%).

The main **objectives claimed by schemes** concern social values, principally ensuring quality products for consumers (fresh, tasty) and direct contact between the producer and the consumer (trust, social capital). Environmental values come second (sustainable development, environmentally sound practices, carbon footprint), followed by economic ones (value added for farmers, support for the local economy). **Motivations**

[10]The Institute for Prospective Technological Studies, (IPTS) commissioned a research project titled "Short Food Supply Chains and Local Food Systems – a state of play of their socio-economic characteristics", the aim being to provide a full discussion of the aims, objectives, approach, results, and conclusions of the study.

are more diversified in north-western Europe than in new member states and Mediterranean countries where the 'quality' theme seems more dominant. In the SMARTCHAIN project, the analysis of the extent of social innovation of the organisations included in the project, using the innovative SIAT (Social Innovation Assessment Template) tool, made clear a rather positive value of the **socio-cultural dimension** (community involvement and activation, new relationships with local actors, participation of local producers in production and /or processing, etc), **higher for northern European countries than Mediterranean ones**, as well as of the **environmental dimension** (selection of suppliers based on environmental criteria, eco-friendly packaging, circular economy initiatives, energy used from renewable sources, etc)[11].

2.5 Legislation and regulation

The diverse legal frameworks applied at EU level fails to consider SFSCs systematically and coherently. **Insufficient structural attention to the SFSCs in the legal framework therefore causes policy gaps and bureaucratic overload**. While the outcome of the post-2020 Common Agricultural Policy is unclear, the initial policy positions seem to indicate that support for SFSCs will remain within the realm of Member States and not be subject to streamlined policy efforts at EU level within that framework. Recent policy developments at EU level do not strongly emphasise the role of SFSCs in a food systems transition.

In May 2020 the European Commission published the new Farm to Fork (F2F) Strategy, whose objective is a major sustainability overhaul of the EU food system[12]. This projected reform arguably has some shortcomings as it outlines "convincing ad-hoc changes" but fails to address a systemic transformation; this is especially illustrated by the mismatch between strategy's ambitious text and the limited scope of the concrete legal actions proposed. This is also true for SFSCs. The F2F Strategy only endorses short, regional and/or short supply chains as a way to create a more resilient food system and to reduce dependence on long-haul transportation but remains silent as to how this would be achieved. The commitment to SMEs, by contrast, is more explicit, with a commitment to foster "tailored solutions to help SME food processors and small retail and food service operators to develop new skills and business models, while avoiding additional administrative and cost burdens." The F2F Strategy, however, does foresee legislative initiatives to enhance cooperation of primary producers to support their position in the food chain and non-legislative initiatives to improve transparency. This may benefit those SFSCs that are primary producers incidentally but is not related to their status as SFSCs. Overall, so far, the F2F Strategy is a missed opportunity to strengthen the SFSC category in the EU food system.

Regulatory barriers for SFSCs

Regulation at EU level is complicated, not transparent, and not tailored to SFSCs. The constant changes and evolutions of legislations and regulatory requirements are fairly confusing and difficult to understand by SFSCs, especially in the field of labelling and nutrition and health claims. **Most SFSCs have experienced a certain amount of difficulties in meeting regulatory requirements** that apply to the implementation of legislation, traceability, authenticity, food transparency, nutrition and health claims, labelling requirements, etc. They find the regulations complex and therefore time-consuming and do not have internal capacities and the resources to deal with them. Obtaining knowledge about what needs to be implemented and ascertaining a definite list of specific legislations that must be implemented is a challenge for most small food producers and farmers. **There are constant changes and evolutions which are confusing to small producers/processors**. It is challenging for SFSCs to keep up with the governments' legislation and changes

[11] For detailed analysis of SIAT application results, please refer to Deliverable 3.6 of the SMARTCHAIN project.
[12] Farm to Fork (F2F) strategy of the European Commission (https://ec.europa.eu/food/horizontal-topics/farm-fork-strategy_es)

to current laws. There is an absence of regular communication about changes and their explanation, and there is no free advisory system or a central information platform that should serve small food supply chains in most countries analysed in SMARTCHAIN.

There is a certain gap in the implementation of EU regulations at national level, which implies that some EU member states do not adequately implement the measures prescribed by EU regulations. This gap is even more evident for non-EU members. The implementation of regulations between countries is not harmonised.

SFSCs face unfair trading practices and there are no consequences for retailers. Specifically, they face late payments and long billing periods for food products, which have a particularly negative effect on perishable products. Payment terms in regulations do not apply to short chains.

There is a lack of knowledge about how to implement HACCP standards. Although they are designed primarily for agri-industrial processes and are quite complex, they allow flexible interpretation to lighten the burden for producers of traditional foods. However, the flexible interpretation has only be used to a limited extent due to the lack of understanding and implementation by the SFSCs and some of the national/local food control authorities.

SFSCs face high taxation rates. In most of the countries, tax law does not recognise SFSCs and is not sufficiently adapted to small producers and farmers.

Although there are a large number of outstanding issues, **there are also good upcoming regulations that should improve the current trading position of SFSCs**.

A new EU Directive: Tackling unfair trading practices in the food supply chain

The EU has recognised the problem of unfair trading practices in the agri-food chain and is currently working to develop an effective tool to prevent the weaker bargaining position of small and medium-sized farmers from being exploited by larger operators, such as major processors and retailers. One upcoming legislative change is the unfair trading practices directive (UTPD) (Directive (EU) 2019/633), which will apply as from 2021[13].

Indeed, **some of the most common unfair trading practices will be banned across the EU**. These include, among others, **late payments for perishable products, last-minute order cancellations, unilateral changes to contracts, refusal to enter a written contract and returning unsold or wasted products**. In the first case, for example, the member states will have to ensure that a buyer is prohibited from paying a supplier for perishable products later than 30 calendar days after receipt of the supplier's invoice or later than 30 calendar days after the date of delivery of the perishable products, whichever is later. When describing the businesses that merit protection, the UTPD relies on the relative economic relationship between the supplier and the buyer as measured by turnover; for example, suppliers which have an annual turnover not exceeding €2 m to buyers which have an annual turnover of more than €2 m.

This directive covers micro enterprises, small and medium-sized enterprises and mid-range enterprises that have annual turnover under €350 m in the food supply chain, in so far as they sell food products to buyers who are not small and medium-sized. Strikingly, and for the first time, it **ensures a standard level of protection across all EU countries**; at present, there is notable diversity in the treatment of unfair trading practices in individual member states. About 20 member states have specific rules, while the rest have either none or merely ineffective specific protection against such practices. The directive will consequently help

[13] Directive (EU) 2019/633 of the European Parliament and of the Council of 17 April 2019 on unfair trading practices in business-to-business relationships in the agricultural and food supply chain (https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX:32019L0633)

reduce the occurrence of unfair trading practices in the food supply chain by securing a minimum common standard of protection across the whole EU.

SFSCs and local markets in the context of rural development programmes

Regulation (EU) 1305/2013[14] establishes the basis for the **provision of support for full development of short supply chains and local markets**, including support for their establishment and promotion. More specifically, article 35.2 (d) stipulates that support shall be granted in order to promote horizontal and vertical co-operation among supply chain actors for the establishment and development of short supply chains and local markets. Likewise, article 35.2 (e) sets out that support shall be granted for promotion activities in a local context relating to the development of short supply chains and local markets.

The specific sub-measure (M16.4) within this regulation exclusively targets supply chains that are 'short' and markets which are 'local'. Rural development programmes identify two main objectives for this sub-measure. The first aim concerns the creation, reorganisation and strengthening of local markets and short supply chains through horizontal and vertical co-operation. The second aim concerns promoting short supply chains, local markets and, in general, more local products. Interestingly, some rural development programmes have chosen to promote co-operation among farmers directly selling to consumers. In the region of the Balearic Islands in Spain, for example, sub-measure M16.4 will support co-operation among farmers who directly sell their own as well as other farmers' products. Notably, no less than 66 different rural development programmes (e.g. 15 out of 28 in France) had planned to support actions belonging to M16.4. However, it is questionable to what extent the different member states and/or regions implemented the sub-measure. In Greece, for example, even though initial plans were meant to support the establishment of farmers' markets in the context of the nationwide rural development programme, policy officials decided not to apply M16.4 at all.

Good examples at national level

If adequately supported, **SFSCs can represent significant policy tools, as catalysts for broader processes of change in attitudes and practices around food**. In that regard, a newly adopted law on agriculture and food in France directly support SFSCs by ensuring that minimum supplies to catering establishments must be delivered by small farmers. To develop SFSCs, the new law on agriculture and food in France puts a focus on catering establishments. It states that products sourced from organic agriculture, quality labelled products and short supply chains must make up 50% of the supplies to catering establishments by 2022. This only concerns catering establishments managed by public authorities, though a number of elected representatives have called for a similar objective for private-sector catering establishments, which account for a substantial share of the market.

Hungarian policy-makers seem willing to answer the call put out by actors in the originally bottom-up local food movement. The New Agricultural and Rural Development Strategy 2020 created a new vision for sustainable local agri-food systems and promoted relocalisation as **a policy tool for reconnecting producers with consumers, towns and the surrounding countryside**. Exemptions and flexibility rules have been successfully introduced, favouring SFSCs developed by small-scale family farmers and small food-enterprises. In the Hungarian Rural Development Programme a thematic sub-programme on the development of SFSCs was launched, to contribute to implementation of the Multiannual Financial Framework 2014-2020 of the European Union.

[14] Regulation (EU) 1305/2013 of the European Parliament and of the Council of 17 December 2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD) (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32013R1305)

A good example of **tax relief for small agricultural producers** can be identified in Hungary. For example, according to the Personal Tax Act, small-scale agricultural producers that do not use itemised expense accounting can choose a 10% expense ratio which may be no more than 100,000 forints. On the other hand, when they choose itemised expense accounting, they may claim 40% of the revenues from such activities. Agricultural smallholders may choose flat-rate taxation. 15% of the revenue from small-scale production is referred to as income, whereas 6% of the revenue is referred to as income from the sale of live animals or animal products. Small-scale agricultural producers with revenue of less than 600,000 forints annually from such activities will not be required to consider income from such revenue, it is exempt from taxation. Producers with revenue of less than 600,000 forints will not pay tax when rural guest table service takes place in accordance with the agricultural and rural development. They are referred to as small-scale agricultural producers.

A Rural Development Minister Decree in Hungary (74/2012. VII. 25)[15] is a good example of **support in labelling issues for small producers and consumers**. It enables the use of signs/labels on products sold in Hungary, indicating the origin, higher quality or the fact of non-industrial production. Such products (Hungarian products, domestic products, domestically-processed products, handmade products) can be easily distinguished from others by consumers. These indications help market the products produced by small producers. There are also some facilities for small producers/processors under EU labelling law. Foods packaged on the sales premises at the consumer's request or pre-packaged for direct sale are exempt from certain labelling requirements, notably the inclusion of mandatory food information directly on the package.

Adaptation of hygiene rules has been identified in Hungary. The Rural Development Minister Decree in Hungary on food-security conditions for sales at local farmers' markets determines simplified hygiene rules for those local farmers' markets, which do not require operational approval but can be legally run by announcing the date and time of the planned activity.

2.6 Typical bottlenecks of SFSCs

In the operation of SFSCs, problems connected to bottlenecks can be identified. If they are bypassed or eliminated by appropriate control and support measures, the SFSCs' performance can be improved. Typical bottlenecks of SFSCs were identified in the SMARTCHAIN project through analysis of the 18 case studies, a review of the state of the art from literature and the experience of the experts involved[16]. The typical bottlenecks were collected for individual stages of SFSCs and SFSCs as a whole (see Appendix A). They are associated to **human capital** (number of employees and their knowledge), **financial resources** (marketing budget), **large distribution competitors**, **climate change**, **worldwide crises**, **limited product volumes**, **bargaining position vis-à-vis retailers** and **bureaucracy**. The main confluent points are described below.

Marketing concepts

One of the most important bottlenecks is **the lack of understanding of the importance of the differentiation of products and services from the conventional chains**, using the 'value-for-money' concept. SFSCs often produce niche products that require special marketing knowledge and market research.

[15] Decree No. 74 of 2012 (VII. 25.) of the Ministry of Rural Development on the use of certain voluntary distinctive signs on food (http://www.fao.org/faolex/results/details/en/c/LEX-FAOC124314)
[16] For more details, please refer to Deliverables 2.2 and 2.3 of the SMARTCHAIN project.

SFSC organisations and individual producers frequently use inefficient marketing and communication tools, and they cannot reach consumers continuously and effectively.

In many cases, **SFSC organisations have a very limited marketing budget**. However, weak marketing activities are not only associated to the lack of financial resources but also to **limited knowledge about targeted consumer groups**.

Product integrity, authenticity, and transparency

Due to the low adaptability to changing demand, there is a **lack of ability to provide product integrity/authenticity/transparency information for consumers and third parties involved in the SFSC** (restaurants, specialty retailers, catering services, etc). Producers and consumers alike are not aware of the real costs of food or about economic realities and mutual ambitions. **The higher price for local products can be accepted by the consumers only if their added value comes from a reliable, local source which can be demonstrated**. If the SFSC producers are unable to effectively communicate the authenticity and transparency of their products, consumers will therefore not admit the higher price and subsequently purchase from supermarkets that offer lower prices.

Food chain management and networking to enhance cooperation

The **lack of knowledge about the principles of food chain management** is the main reason for the difficulty of meeting continually changing consumer needs and demands. **The lack of cooperation between members and the low level of networking** are barriers to the effective functioning of an SFSC. Without the joint use of financial resources, it is difficult to finance the high costs of production, transport, marketing and investment in production/storage systems. In sum, SFSC members are not familiar with the techniques by which they could combine their resources, capabilities, and skills, even although those techniques are available for the application of mutually beneficial innovative solutions.

The **generation gap** must be mentioned as well, since it is directly linked to the innovativeness, limited ambitious mentality, lack of open-mindedness and new ideas.

Business model

The **lack of knowledge about business modelling** or the malfunction of the model is identified as a bottleneck. The lack of skills in developing a commonly agreed philosophy makes the decision-making (all members must agree on each decision) complicated and slows it down.

There is still little knowledge and experience regarding how to manage and develop human resources. There is a lack of professional staff for designing and operating a business model for a specific case. The lack of business models for recruitment and human resources management also presents great problems for SFSCs. Competent application of the business models can serve as a tool for the improvement of competitiveness.

Policy environment

The **policy environment is a general problem and barrier for SFSCs**. The shortcomings of rural development policy are due to the fact that **in many cases it does not operate as a support system for SFSC actors** that would help their economic and social development. The main reason for this is that SFSC producers are the smallest members, whose main activity is other than agriculture. **The eligibility criteria**

and pre-financing (and co-financing) are the main barriers. The lack of available public funding for SFSCs (EU and national level) means barriers to investments and the use of innovative methods.

Legal requirements and labelling

The lack of specific legislation for SFSCs is a real problem for all the actors. Moreover, the different national interpretations of relevant EU legislation have a negative impact. The regulations on food hygiene and labelling associated to specific traditional food products (products considered authentic, traditional) are very complex.

Operating certified food quality systems (PDO, PGI, traditional speciality guaranteed (TSG), etc) **is very costly for small-scale producers**. In some countries, the lack of national regulations on quality requirements and the required processing technologies for traditional food hinders the production of local products.

The new innovative short channels (CSA, online delivery system, drive system, etc) **are not recognised by local or national authorities**. The very detailed rules cannot keep up with new practices. Farmers and producers are unable to meet the requirements of these regulations without the help of national and EU institutions or consultants.

Bottlenecks in the production chain

FARMING AND PRIMARY PRODUCTION

Due to the lack of expertise in production of the raw material and the lack of people who are experts in agricultural production, **SFSCs find it hard to achieve a good quality of raw materials**. The producers' lack of knowledge about new farming methods and technologies makes it difficult to find the appropriate innovative solution for the above-mentioned problems.

The **unpredictability of weather** is also a bottleneck to be considered since makes it impossible to predict the quantity and quality of production for a given year. In many cases, farmers have noticed that solutions meant to help avoid weather's influence on production (resistance against drought, frost, hail, etc) are **expensive and not available for small farmers**.

Many of the products of SFSCs are **perishable goods**. Effective post-harvest technologies such as refrigeration, drying and simple preservation techniques are used on a limited basis in some countries.

PROCESSING AND PACKAGING

The producers' lack of knowledge about processing technologies makes it hard to identify the precise technological problems and subsequently the potential solutions for them. Most innovative processing and packaging solutions must be adapted to the individual companies/producers, for which the necessary human and/or technical background and financial resources are not available.

STORAGE, TRANSPORT AND SALES

The quality and safety of products are endangered if the **cold chain from farm to consumer is not properly assured**. In the case of home delivery, the use of transport vehicles supported by logistics software is required, which makes it expensive. Several kinds of bottlenecks can be identified concerning sales in SFSCs.

Farmers and producers have limited knowledge about the demand for new and even traditional products. Due to seasonality, the volume and quality of products vary. The supply therefore does not always match consumer needs and expectations. **SFSC farmers usually do not have enough knowledge about the different sales techniques** by which they can easily access consumers.

Some producers recognise the opportunities in niche products, but they are hindered by a lack of knowledge on how to identify and **reach the particular consumer groups** that are potential customers of those niche products.

CONSUMERS

A typical bottleneck is that **consumers do not have reliable information about local products and local production**. When they purchase goods, they compare the prices of products from SFSCs to those from conventional long chains. It is difficult for consumers to accept the higher prices of local products as proportional to higher value if they are not properly informed about the additional benefits of the local products. Furthermore, in several cases, **the lack of product diversity results in a lack of choice** that also means a bottleneck for SFSC actors.

2.7 Typical success factors of SFSCs

In the context of SMARTCHAIN, the success factors of the SFSC case studies were studied[10] (see Appendix B). The typical ones concern **product attributes** (high quality, local, organic, sustainable), **transparency** (between consumers and other members) and the focus on local products associated to **reduced food safety and health risks compared to products from conventional chains**. That became particularly important by the time of the **SARS-CoV-2 pandemic**. The main confluent points are described below.

Marketing concepts

A sound, **well-designed marketing concept is a significant success factor**. For 10 cases, different good practices could be identified. The key factor is the "**strong profile on social media and transparency**". Moreover, it is very important to enable "**easy and fair communication with consumers (website and social media)**".

A **common brand** of producers promoting healthy and sustainable eating habits is also a success factor. In line with the above, there are various ways to reach the consumer: e-commerce, direct communication between farmers and consumers, online sales and tailor-made services. As a result of a long-term strategy "good marketing position at local and international level" can be achieved.

A new marketing concept can be achieved through **the involvement of other areas such as agri-tourism and cuisine.** Newly involved sectors, through their communication activity, can promote the short-chain organisation.

Product integrity, authenticity, and transparency

Ensuring product integrity/authenticity/transparency is one of the most important success factors for SFSCs (in 14 case studies). The key elements in **gaining consumer confidence are authentic, local, traditional and 'specific quality' products**. Also, **sustainable production and organic production** must be considered as important criteria.

Food chain management and networking for enhancing cooperation

Food chain management and networking are key elements among success factors. One group of success factors includes **good practices for cooperation between producers and other SFSCs actors** (the employment of disabled and handicapped people, common marketing (logo, website, presence in events, etc) and sales, fair income for farmers, etc). The other group of success factors includes **good practices on how to collaborate and communicate with consumers** (solidary participation of producers and consumers sharing economic responsibility, the producers are well known in the local community, consumers gain access to spaces of experience and education as well as shared learning and innovation, etc).

Policy environment

An appropriate policy promoted by national, regional, and local authorities must also be considered a success factor. For example, the availability of **public funding (grants, zero-interest loans) to support innovation and infrastructure investment on SFSCs** can make a difference (especially for the launch of new initiatives where the economic risk is high).

Success factors in the production chain

FARMING AND PRIMARY PRODUCTION

The **high-quality local product** is a success factor for 8 case studies. Fresh and natural products are of great value to consumers. Moreover, sustainable production and animal welfare are key messages to environmentally conscious consumers. Traditional local products are thus success factors for farmers and producers in SFSCs.

TRANSPORT, PROCESSING AND PACKAGING

Sustainable production, packaging, and delivery were identified as a success factor in 2 case studies. It seems that **sustainable production** could be an important criterion in SFSCs, distinguishing local products from conventional foods.

SALES

Sales is a success factor when the SFSC actors can find **a way to reach consumers effectively and continuously**. Innovative solutions for sales can be considered a success factor. These are diverse selling points, online sales, and good marketing positions at local and international levels, supported by low transaction costs and a fairer price. Finally, the "**Steep increase in the interest to purchase from local and regional sources by consumers as a consequence of the SARS-CoV-2 pandemic compared to the other market channels**" is another important element for sales as a success factor.

3. Innovation in short food supply chain initiatives

3.1 What is innovation in the short food supply context?

Innovation in SFSCs can be defined as the **process** by which a **change** is induced in current procedures, resulting in **improved performance** that provides a **better 'value for money'** and a **sustained**

competitive advantage. Innovation must lead to a change; it does not have to be associated to an invention. To invent is to think, to innovate is to do, so the result of the innovation reaches the market and society.

In this context, **process** is a very general concept that includes actions of different nature, such as to implement new technology, develop a new food product, use knowledge (already existing or new knowledge that can be acquired through advisory services or developed internally or through external collaboration), use effective management and commercial and/or control tools/software/strategies, etc. It may be something as simple and free of charge as to share spaces and resources, register and analyse key data or even to involve the consumer in harvest tasks.

Innovation can happen at **any point in the value chain and in any part of the business**: production, primary processing, food-processing technologies, food packaging, food safety and food quality measurements, logistics/access to consumers, last-mile delivery, compliance with legal requirements, marketing and value-chain strategy concepts, flexibility, and adjustment of implemented methods to the specific local ecosystem, collaboration and value chain management skills, etc.

Innovation in the SFSC context is important because it allows **the rebirth and survival of farming practices** through social improvement and new models. Neo-traditional SFSCs, such as farm shops located in the city or shared-ownership farming systems, or farmers/associations with advanced transformation and preservation technologies, apply innovation as a value proposition to achieve a competitive advantage with respect to product characteristics and producer-consumer interaction.

Innovation can **improve the performance** of SFSCs by eliminating/reducing their typical bottlenecks and enhancing exploitation of their typical success factors (see Sections 2.6 and 2.7). Improved performance commonly leads to gains in efficiency or reductions in cost, meaning the ability to do things well and successfully, without waste and/or minimal investment.

A typical weakness of SFSCs is the limited use of marketing knowledge. For example, many SFSCs complain about their vulnerability in price competition, but limited efforts are paid to a '**value for money'** approach based on clear **differentiation from conventional chains**. Innovative initiatives in SFSCs can put more emphasis on authenticity, the tradition aspect, originality and traceability of the products. The values the consumers perceive such as freshness, naturalness, labelling, expiration date, product diversity and ingredients, should be emphasised more to strengthen the image of 'value for money'.

A **sustained competitive advantage** in SFSCs does not necessarily have to be associated to major changes in the product (new processing technology, new product concept, new recipe, etc). It could be associated, for example, to a quality label, better logistics system, new supply channel or better packaging. Although this may involve very little change to the product itself, such innovation is still important for competitiveness and long-term success, as it offers greater value to customers and stakeholders. In the SFSC context, **trust can also be a target of innovation to enhance competitiveness**, as well with easy access to local food and clear, easy-to-understand messages about the respective benefits. In short, the competitive advantage of an innovate initiative may be due to:

- ✓ **reduced costs** (economies of scale, longer shelf life, economic benefits resulting from increased product margin, lower transaction costs and fair prices, less distribution cost, etc);
- ✓ **product differentiation**, with gains acknowledged by purchasers due to its unique quality (high quality, local, non-manipulated/adulterated, sustainable, fresh and natural, animal welfare, etc);
- ✓ **service differentiation** based on the accessibility of products from SFSCs for consumers (geographic proximity, diverse selling points, home deliveries, greater product diversity, etc); on skills and knowledge (a potential place to learn about food production and about nature, place to educate children through play, etc); on social connection; and on trust (environmental sustainability, directly from growers, transparency, unique products, support for producers, consumer participation, etc).

3.2 Classification of innovations

There are multiple kinds and classifications of innovations. They may concern an innovation in process or product (or both), incremental or radical, affecting to production, marketing, management or other areas, etc. Labelling innovations does not make them automatically more successful. However, **knowledge of the common features shared in the innovative initiatives can help better understand the European SFSC ecosystem**, with a view to designing value proposals and analysing their applicability. Categorisation of innovations can also it easier to identify their own ideas or projects with existing innovation cases and/or to obtain innovation-related ideas.

After evaluation in the SMARTCHAIN project of more than 140 innovative initiatives, the innovations in SFSCs may be classified as **technological, non-technological and social** (Figure 3). Specific definitions have been internally adopted based on the project results and the bibliography.

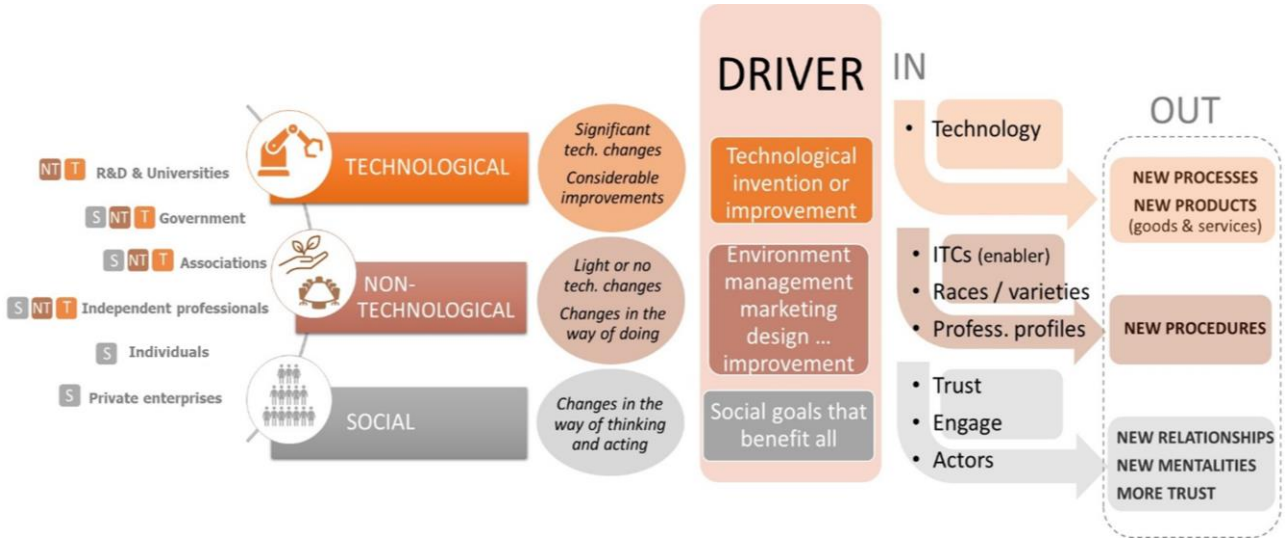


Figure 3. Diagram of the different kinds of SFSC innovations according to the SMARTCHAIN concept.

Technological innovations are primarily driven by a technological invention or improvement and comprise new products (goods and services) and processes and significant technological changes of products (considerably improved) and processes. An innovation has been implemented if it has been introduced in the market (product innovation) (OECD, 2015).

Many innovations are of a **non-technological** nature, for example in areas such as marketing, organisation management and design. Those not primarily driven by a technological invention or improvement are hence referred to as non-technological innovations. The term is not unproblematic, since a technology (for example information and communication technology) is used as an enabler to support most of today's innovations, even when technology is not the focus or driver of the innovation (European Commission, 2019).

Social innovations are processes that change SFSC systems by changing the relationships, perspectives, and ways of thinking and acting of the actors involved, leading to the achievement of primarily social goals that benefit all (of the SFSC actors). Social innovations bring about change (new relationships, new mentalities).

3.3 General characteristics of a successful innovation

More than 20 successful innovations were identified in SMARTCHAIN case studies. Twelve of them were characterised and deeply analysed, among others, with respect to extent of innovation, profitability and potential use[17]. Based on this analysis, and on the bibliography and the knowledge and experience of SMARTCHAIN partners, a list of **6 general characteristics of successful innovation in SFSCs** was established (Figure 4). These characteristics are average and all of them are not present in all the successful innovations. Examples of positive and profitable innovation can therefore be found outside of them.

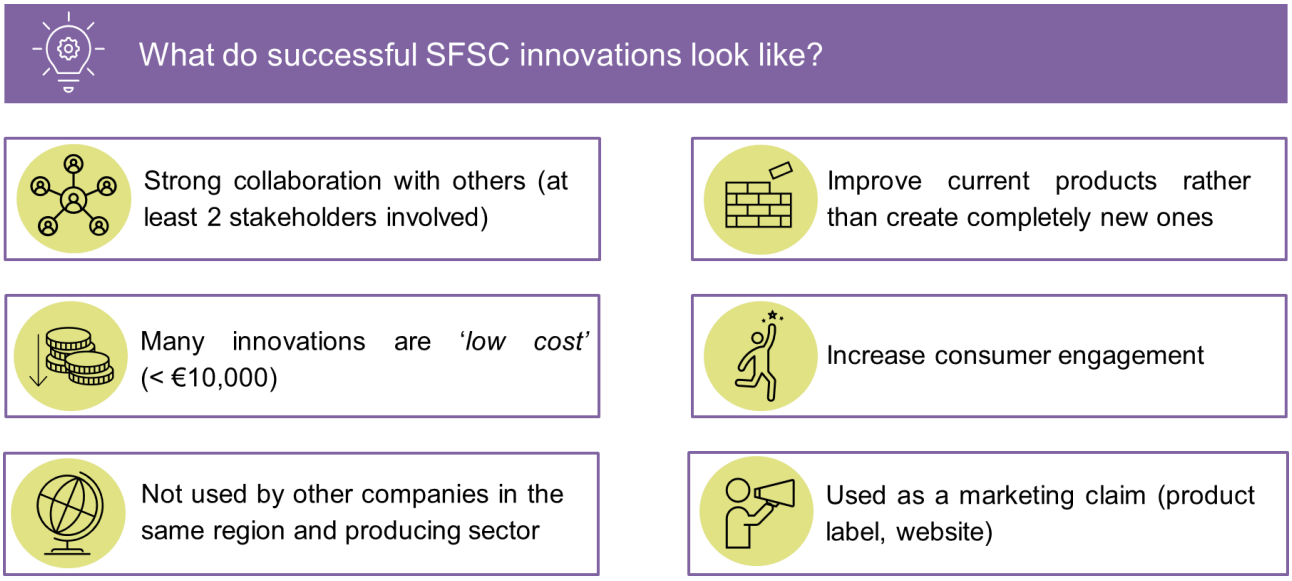


Figure 4. General characteristics of successful innovation in SFSCs.

The involvement of stakeholders is essential for innovation to be successfully implemented and sustainable (see Section 3.4). In average, **at least 2 stakeholders** were involved in the studied innovations of SMARTCHAIN. Stakeholder cooperation facilitates innovation in SFSCs in at least two ways: it reduces the costs of implementing innovations that promote value creation in the supply chain, and it provides relevant know-how for the implementation.

An innovation is not necessarily be associated to a high cost and an entirely new idea. **Innovative actions can have a relatively low cost and be new just for the organisation that implement them**. Indeed, a large part of the innovations in SFSCs derive from the **inclusion of innovations successfully implemented in other fields or other geographical areas**. An example of this is the rapid development of digital technologies, widely used businesses with a more complex organisational structure and in technological applications; they provide a range of new enabling functions and solutions which can be adapted to SFSCs. According to the SMARTCHAIN results, more than 90% of innovations in SFSCs are used by others in other countries or in other regions (of the home country).

Innovation sometimes consists of refining or improving processes or products (incremental innovation); sometimes the change is major, disruptive, and may completely reshape or redefine the way something is done (radical innovation). Incremental innovations tend to be dismissed and much greater value is put on (potentially) breakthrough innovations. However, innovations that may not be technologically

[17] For more details, please refer to Deliverable 7.1 of the SMARTCHAIN project.

significant enough to attract global attention can still be very important from an economic standpoint. Indeed, according to SAMARTCHAIN, two thirds of the innovations applied in SFSCs are incremental.

As explored in SMARTCHAIN, consumers generally have little understanding of SFSCs. In some countries, SFSCs have significant problems connecting with consumers (see Section 2.3). As in any business, the way to long-term sustainability is finding the right customers who value the product and are willing to pay. Thus, a relevant number of the innovations studied in SMARTCHAIN improve **consumer engagement**, for example, by facilitating purchases, improving the connection with them, promoting social events or involving them in the production process. Consumer-related innovations are commonly associated to successful SFSC initiatives: **in successful SFSCs, consumers are often at the heart of the business**.

Finally, innovation applied successfully is commonly used as a **marketing claim** by the organisation. This means that SFSC initiatives use the applied innovation as a marketing tool: highlighting it on the label and/or on the website, using it as a key part of the respective value proposition and employing it as a sales argument when talking with restaurants, specialty retailers or catering services.

3.4 The role of the stakeholders in innovation

Although some SFSC initiatives are able to innovate without external help, they are (very valuable) outlier cases. After the analysis done in SMARTCHAIN, it can be concluded that **innovation in the SFSC context is clearly multi-actor**. **Knowledge transfer and sharing play a main role**. Due to the general features of SFSC initiatives (SMEs, low resources to invest in R&D), the only way to innovate with a high probability of success is to be sure of being associated with appropriate stakeholders that complement the competences, resources and knowledge of the SFSC initiative.

The specific roles assumed by stakeholders in the SFSC innovation process were studied in the SMARTCHAIN project[18]. Among the 23 stakeholders taking part in 12 successful innovations selected, six categories of stakeholders were established: (1) governments, (2) research centres and universities, (3) associations, (4) private enterprises, (5) independent professionals, and (6) individuals. The most important ones were governments (normally at a regional or local level), independent professionals (farmers, self-employed professionals, consultants) and associations (professional unions, sector associations, farmers associations, operative groups). The stakeholders principally play 4 types of roles: funding, structural support, technical assistance, and dissemination (Figure 5).

A **funding role** was performed by 25% of the stakeholders involved in the SFSC innovation. This role is normally played by governments or private enterprise.

Structural support was performed by 46% of the stakeholders involved in the innovations studied in SMARTCHAIN. This encompasses functions continued over time and those enabling the innovation's survival. These regular functions may be knowledge transfer (ideas, professional/technical advice, methods, good practices, etc) and resources supply, either human (people sharing ideals provide their work and a community feeling) or material, including infrastructure (facilities, tools, equipment, etc). Individuals, independent professionals and associations generally play this role.

Technical assistance (21%) means occasional technical, technological, and/or scientific participation that takes place mainly at the beginning of the innovation. It usually requires technological support and research

[18] For more details, please refer to Deliverable 7.1 of the SMARTCHAIN project.

activities (e.g. testing and validating the technology on which the innovation is based). This role is mainly covered by research centres and universities.

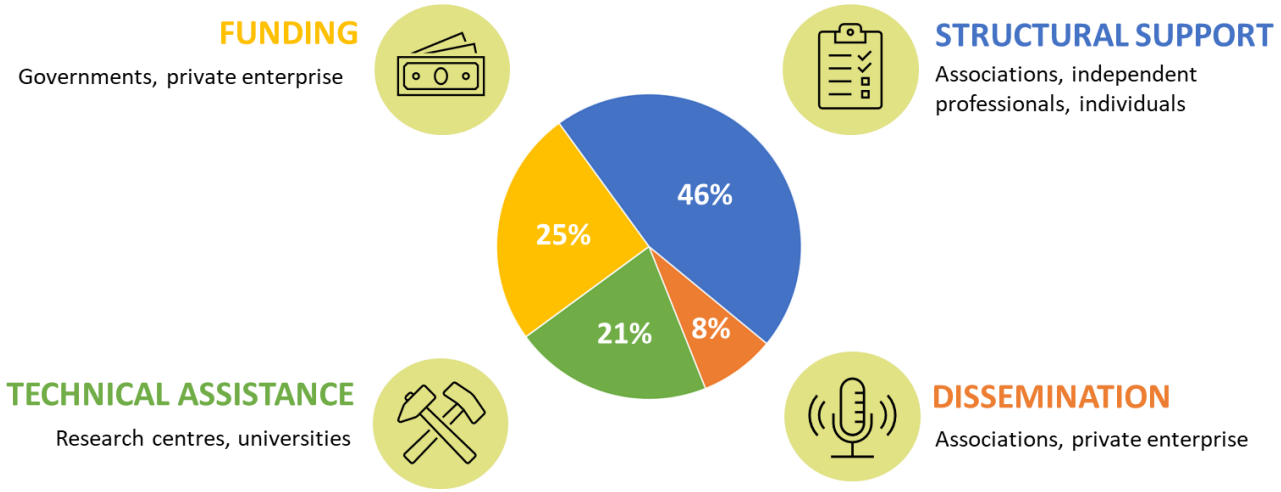


Figure 5. Main roles of stakeholders involved in the innovation process in SFSCs.

Dissemination (8%) includes activities that increase visibility and promote and spread the innovation (informative seminars, promotional events, potential uses of resulting products, etc). Associations and private companies are normally the stakeholders that assist SFSC initiatives in communication and dissemination activities.

The stakeholders involved and their specific roles varied somewhat according to the innovation type. In **technological and non-technological** innovation, around two stakeholders are normally involved. They mainly pertain to four kinds of stakeholders: (1) research centres and universities, which are a direct source of know-how for the development of new technologies and innovation of production processes and products; (2) independent professionals (farmers/self-employed professionals), who exchange ideas, advice, work and resources as components of the innovation; (3) associations (professional unions/sector associations/operative groups within them), with a structural role, taking part in the innovation through knowledge exchange and resource supply in a continuous manner, also providing technical support on demand or being active in disseminating the innovation; and (4) government as a funding actor, through subsidies and grants.

In comparison with technological and non-technological innovation, **social innovation** is commonly supported by a larger number of stakeholders. Three or four stakeholders are usually involved, although there are cases in which six or more entities work together. This wider approach may be related to the inherent collaborative aspect of social innovation. Governments, associations, private enterprise, independent professionals and individual people are the most usual ones. However, the involvement of independent professionals and individuals (producers) is normally of crucial importance. They stand out as community builders and front-runners; they are also usually users of the innovation (farmers, consumers, students, etc).

4. Examples of best practices of innovation

In this section, **12 examples of best practices** of successful technological, non-technological and social innovations are described, to inspire SFSC practitioners and better understand the innovation context.

4.1 Technological innovation

FREEZE-DRYING

La Trufa de Álava, SPAIN

Company description

La Trufa de Alava **cooperative** was founded in late 2006 to **produce and market fresh truffles**. The truffle cooperative of Alava is currently formed by a total of 57 members; it is the reference company for truffles throughout the Basque Country.

Problem/s

Truffles are a seasonal product with high value, though with a **high humidity content.** Therefore, **this product is very perishable** (shelf-life of days). The **truffle season is short;** nowadays it is impossible to guarantee the year-round presence of high-quality truffles in the market.

Innovative solution applied

Freeze-drying is a novel processing technology which **enables reduction moisture content, while maintaining quality** as much as possible **with respect to conventional drying technologies** in which high temperature is applied. These high temperatures negatively affect truffles' aroma.

Cost-benefit analysis

The cost of the investment needed (freeze-drying unit) **is relatively high** for a small company (estimated to be more than €10,000). However, **sharing the investment between the 57 cooperative members** and **the possibility of selling truffles year-round** (reaching new markets and customers) makes the application of this technological innovation profitable.

Improving the value proposition

This innovation will allow truffles with appropriate aroma to be sold year-round, minimising loss of quality with respect to others dried truffles on the market. **The freeze-dried truffle will become a new product reference for the company and it have a commercial advantage over competitors**.

VENDING MACHINES FOR AGRICULTURAL PRODUCTS

Einkaufen auf dem Bauernhof
weil's vom Land kommt

Landwirtschaftskammer Niedersachsen, Germany

Company description

Landwirtschaftskammer Niedersachsen is an **agricultural administration and advisory institution** in the fields of agriculture, horticulture, and forestry. It is an **independent, self-governing legal entity** of public law, commissioned by the federal state of Lower Saxony.

Problem/s

Dedication to consumer **sales consumes time** and may interfere with daily production activities. Also, **consumers have limited access** to farm/production facilities; some consumers may be discouraged from acquiring products due to pick-up distance, limited opening hours, difficult public/private transportation access, etc.

Innovative solution applied

Installation of a **vending machine for farm products** that can be accessed by consumers 24 hours a day at a convenient location. Farmers have a new way to sell fresh food products directly to the public, without having to personally deal with consumers.

Cost-benefit analysis

The cost is **moderate** (€1,000-10,000). It **does not add value to the product.** However, it is a new sales channel which provides a **competitive position in terms of efficiency,** as the producers do not have to interrupt their work to sell the products**.**

Improving the value proposition

It can be applied to a wide variety of products, providing farmers with a new way to sell fresh food products directly to the public **24/7 at a convenient location, without having to personally deal with consumers.**

MOBILE POULTRY COOPS

Einkaufen auf dem Bauernhof
weil's vom Land kommt

Landwirtschaftskammer Niedersachsen, Germany

Company description

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Problem/s

Traditional poultry farming is not well perceived by consumers due to animal welfare issues**. Free-range farming of egg-laying hens is increasing**. However, silting, over-fertilisation and accumulation of parasites are **problems associated to this farming method**.

Innovative solution applied

Mobile **chicken coops are fully equipped, movable pens**, which can be used throughout the year to house chickens. Their movability and flexibility **prevent and/or reduces silting, over-fertilisation and accumulation of parasites**. The system can provide consumers with a transparent farming system that promotes animal welfare.

Cost-benefit analysis

The cost is **moderate** (€1,000-10,000), depending on the size of the module; the **increase in economic product financial value is low.**

Improving the value proposition

It can endow a company that uses this innovation as a **marketing claim and central value point** of its business model with a clear **competitive position**.

REPLACE MEAT WITH OYSTER-MUSHROOM STEMS

Natuurlijk Vleespakket, the Neetherlands

Company description

Natuurlijk Vleespakket is an organisation that sells **certified grass-fed beef originated in nature parks**. This is a **brand new certification:** only one farmer in EU so far has this certificate (March 2021).

Problem/s

Meat products have high impact in the environment. Cattle is responsible for a considerable amount of greenhouse gases emission. Institutions and consumers increasing demand **alternatives to reduce their meat intake without compromising quality and taste**.

Innovative solution applied

The development of a reduced-meat beef burger wherein **50% of the meat is replaced by oyster mushroom stems,** a (local) food waste product. This innovation replaces animal protein with other more environmentally friendly protein and boosts the value of a food by-product.

Cost-benefit analysis

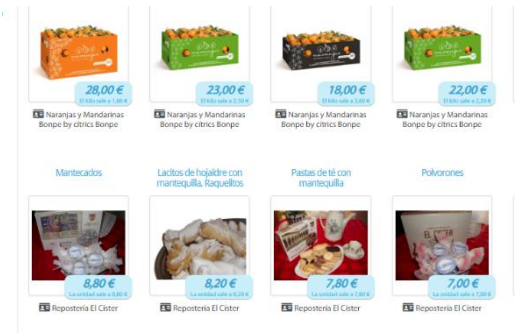
The cost is **low** (<€1,000); it can provide a **competitive advantage** as it represents a new product that follows market trends.

Improving the value proposition

The new product can be claimed to be more **environmentally friendly** because it uses less meat, leading to lower **greenhouse gas emissions** through the valorisation of oyster mushroom stems, resulting in a **reduction of food waste**, as that by-product would otherwise be discarded.

4.2 Non-technological innovation

HERMENEUS ONLINE MARKETPLACE



hermeneus

Hermeneus World, Spain

Company description

The Hermeneus online marketplace is an initiative of Hermeneus World (Spain) for Spanish SFSC producers. This company specialises in the creation of online marketplaces and information and communications technologies (ICTs) to improve digital marketing.

Problem/s

In many cases, small producers **do not have enough resources to create and maintain their own websites and online shops**. Furthermore, **they do not have the resources for strong online promotion** and **consumers are not aware of the respective website and online shop**. From a marketing standpoint, establishing a trustworthy online identity is also a key to engaging consumers. Due to the SARS-CoV-2 pandemic, there is **increasing demand for online orders and home delivery**.

Innovative solution applied

Through an online marketplace, SFSC producers can have their websites hosted by a third party and sell their products online, controlling prices, delivery and payment methods. A good example is the **Hermeneus online marketplace** (https://www.hermeneus.es/). This digital marketplace collects the offerings of several SFSC members, generating a complete catalogue of different kinds of local food. **Consumers can easily and quickly buy their SFSC foods from different producers using only one tool (Hermeneus marketplace)**.

Cost-benefit analysis

Hermeneus charges **a flat fee to host the producer in the platform.** But **there is no commission per sale** (neither for consumers nor for producers). The benefits for SFSC producers are several: creation of their **own online store and website**, **better service provided to current consumers**, and the ability to **contact potential new consumers** through the community, directly **connect with consumers** (no intermediary) and **be part of a community involved with local commerce**.

Improving the value proposition

Through a wide network of users, it is easier to reach the targeted consumer segment. **An online business can begin operations, even with a small marketing budget**. The direct interaction with consumers **enhances the relationship with them**.

LEAD USER APPROACH

Alce Nero, ITALY

Company description

Alce Nero is a company that currently works over 6,000 hectares in Italy that have been converted to **organic farming** methods, and it is still growing. The enterprise brings together **more than a thousand Italian farmers and beekeepers**, gathered under the umbrella of a group of 12 great partners; soon to be 16. Their products include, among others, tomato sauces, pesto, oils, pasta, rice, biscuits, sweet snacks, honey and fruit purees.

Problem/s

To introduce new products, **market research should be typically carried out. But large-scale market research studies are expensive**. Alce Nero's products are of **high quality at a corresponding price**. Therefore, **the willingness to pay is also relevant**.

Innovative solution applied

The lead user approach is a cheaper alternative for collecting information on new market trends. Lead users are consumers who are able to identify the needs of today that will play an important role in the mass market in the future. By integrating them in the product development process (e.g. workshops), food businesses, including SFSCs, can **minimise manufacturing and sales risks**, **better understand the market and develop a sustainable relationship with those customers**. The result is a battery of **more or less finished food concepts** that have to be taken up and refined within the company. It should also be verified whether the concepts developed by a lead user approach will also interest the average consumer. Using the lead user approach, conclusions can be drawn based on the opinion of a few people, for a larger number of customers.

Cost-benefit analysis

The search for lead users and respective payment would be incurred as cost (<€10,000).

Improving the value proposition

Lead users are often the pioneers in innovation of novel products and services. **The lead user method is a market research tool**. Unlike traditional market research techniques (which collect information from target market users), it collects information about both needs and solutions from leading as well as analogous markets. It **enables the creation of innovative foods based on consumers' needs and ideas.**

METHOD FOR SETTING COMMON GOALS IN SFSCs AND NETWORKS

Truefood project

Company description

The innovation does not concern a specific company. It is a generally applicable solution for each SFSC organisation. **The method was developed in the TRUEFOOD project** (FP6, EU) and used successfully for several local and traditional product organisations and food chains.

Problem/s

In the market, **consumers evaluate the joint performance of all members of a supply chain when making a purchase decision and not the separated performance of individual members**. Joint performance is therefore an important factor in the market success of the products and services of a SFSC. For successful operation of a food chain or network, its **members must identify common goals that can benefit all of them**. **This is not usually easy, because the different members' interests and objectives are diverse**.

Innovative solution applied

The purpose of the method is **to find common goals among the members of a food chain or network, which provide mutual benefits for all**. **First, the members' individual goals for achieving a strategic target should be identified, collected, and described**. **Individual goals will then need to be harmonised**. Individual goals need to be evaluated to ensure that they target a common direction, conflict, or diverge. This is a time-consuming iterative process for which **the assistance of a chain/network coordinator is necessary**. The chain coordinator will explain the potential advantages of combined use of the complementary resources, capabilities, and competencies of the chain members, to achieve common goals for mutual benefits. **All participants must be committed to finding a joint solution and respecting the interest of the other parties**; this requires patience and flexibility.

Cost-benefit analysis

There is no investment cost apart from the time invested by the participants. A significant benefit can be achieved by **focusing all resources and effort on achieving a joint target** with mutual benefits for all participants.

Improving the value proposition

The combined use of complementary resources, capabilities, and competences of the members of SFSCs, networks and associations provides **mutual benefits for all members, adjusting the value proposition while considering the common goals determined**.

COMMON TRADEMARK SYSTEM

Éltető Balaton- felvidék Association, HUNGARY

Company description

The **Éltető Balaton-felvidék association coordinates the rural development activities of 59 settlements in North Balaton**, an attractive tourist area on the north shore of Lake Balaton known for its culture and cuisine. Its aim is to **support joint exploitation of resources, high-quality products and services** among scattered individual local producers and service providers, to enable better marketing, provide new trade channels and connect them with local/rural development programmes and actors.

Problem/s

Scattered local producers and service providers make high-quality products, though with a **low level of marketing, cooperation and connection with local/rural development programmes and actors**.

Innovative solution applied

The **Cooperating Balaton Uplands Trademark System** (https://eltetobalatonfelvidek.hu) **undertakes joint marketing of products from local and rural manufacturers and small producers.** It is a member of the **European Territorial Rural Quality** umbrella quality mark system. This quality mark **distinguishes special products in the region, helping promote products/services**. They have established 15 sales points, 13 in the area, 1 in a larger town, the seat of the county, and 1 in the capital Budapest. They also carry out **other marketing and promotion tasks** such as organising events and local exhibitions or maintaining a general website. The condition for use of a trademark is that **the producer must cooperate with at least one other trademarked producer**.

Cost-benefit analysis

A membership fee must be paid by members of the association. **This is a cost-effective method for operating the joint marketing strategy**, based on the differentiation of local SFSC products from a specific area.

Improving the value proposition

Communal participation helps improve and expand the quality, quantity and diversity of the services and locally manufactured products. The cooperation helps ensure preservation and renewal of environmental and regional values, expansion of the production and service opportunities and improvement of the rural inhabitants' quality of life. The activity's success is based on **differentiation from other products, services and regions through distinguishable quality and value for money**. The importance and benefits of joint marketing and the coordinated work combining local products and services, tourism and local culture is a visible success factor.

4.3 Social innovation

EMPLOYMENT FOR HANDICAPPED PEOPLE

Lantegi Batuak (NAIA), SPAIN

Company description

NAIA is a company located in Bizkaia in Basque Country which grows and produces **100% organic salads and pre-cut vegetables**, supporting the local agricultural sector. Behind this project is Lantegi Batuak, a non-profit organisation that generates job opportunities suitable for people with disabilities, to enhance their quality and development.

Problem/s

People with disabilities have problems finding jobs. Lantegi Batuak has a significant level of social understanding and tries to help resolve this issue. Moreover, there is **strong competition in the vegetable-producing sector**. The company need **unique marketing claims** to be different, find its niche and increase the added value of its products.

Innovative solution applied

All workers on the production line are handicapped people from the region.

Cost-benefit analysis

This social innovation does not have cost. Indeed, **Spanish government subsidises 50% of the minimum inter-professional salary of the disabled people hired**. This is a very interesting innovation from both the social and the economic standpoint.

Improving the value proposition

The employment of handicapped people is used as a marketing claim in the label of NAIA products (100% Social). The company also uses this social innovation as a central value point of its business model. Some people want to support this kind of social initiative in the region and positively evaluate the company's social awareness. **There are not many food companies which focus on improving social aspects.**

COMMUNITY-SUPPORTED AGRICULTURE

Solidarische Landwirtschaft
sich die Ernte teilen

Solidarische Landwirtschaft, Germany

Company description

Solidarity-based agriculture or community-supported agriculture (CSA) is **partnership between private households (members) and farmers**. Members **share the costs** and risks of food production by making a commitment to pay a certain amount to the farm each year. In return, they **receive their share of the harvest**.

Problem/s

Farmers are **responsible for the costs and risks** of food production. They depend on market structures and wholesale prices. Their **income can vary greatly** from year to year.

Innovative solution applied

Solidarity-based agriculture promotes **sustainable, risk-shared agriculture.** Farmers reduce the dependence on market structures, wholesale prices and subsidies. They receive a **predictable income** which greatly **reduces marketing efforts**. Moreover, it ensures access to regional food products, provides spaces of experience and education, and promotes the preservation of artisanal and diverse agricultural practices. Solidarity-based agriculture provides **fair conditions for farmers and complete transparency for consumers**.

Cost-benefit analysis

This social innovation **does not have cost**. Farmers obtain funding thanks to the members who receive a share of the harvest in return.

Improving the value proposition

Transparency and trust are ensured across all levels of production. The food loses its price tag and gets its value back. For people who are generally interested in transparency issues of food production, there is a **clear advantage** over conventional competitors.

A VENUE FOR TRANSFORMATIVE ACTIVITIES

Allotropon, Greece

Company description

Allotropon is a venue where **members engage in social activities**. They make **social links with other members or the local community**. The Allotropon grocery store is home to Café Allotropon, which serves as a meeting point to exchange ideas and a venue for different events, such as food fairs, cultural happenings, public discussions and socially oriented actions.

Problem/s

Consumers may encounter difficulties when seeking venues to share ideas and network with people who have similar interests. **SFSC initiatives find it hard to engage consumers.**

Innovative solution applied

Allotropon is a venue where **members engage in social activities**. They make social links with other members or the local community. Members use the grocery store on a regular basis to exchange ideas with each other and with the local community. They organise the various **social events** that take place on the store's premises. Social economy actors supply the store with local **fair-trade products**. Agronomists regularly advise and **exchange knowledge** with members on quality and food safety issues.

Cost-benefit analysis

The cost of transforming the grocery store is **moderate** (€1,000-10,000) and depends, among others, on venue location and size.

Improving the value proposition

Members buy regularly as they feel engaged with the social activities and local fair-trade products. The company uses this innovation as a central value point of its business model.

TRAINING AND GUIDANCE FOR STUDENTS

Local2Local, the Netherlands

Company description

Since its inception in 2014, Local2Local has become a **leading short food supply chain initiative** in the Utrecht region. The company provides the 'business to business' and 'business to business to consumer' market (strategically aimed at government, semi-government and healthcare) with produce from its own and several partnering SFSCs. Among others, this company is the leading partner in three regional alliances (Utrecht, Flevoland and Amsterdam Metropolitan Area) and the co-founder of the Task Force Short Chain (which received a mandate from the Dutch Ministry of Agriculture).

Problem/s

There is **no longer a direct relationship between citizens and farmers**. The dominant food system of large volumes at lowest possible cost is not the most ecologically, economically, socially and culturally sustainable. **Consumers do not know how the food is produced on farms**. They are **disconnected from the importance of maintaining local food production**.

Innovative solution applied

Increased engagement of society with the SFSC. They **offer students and young talents a place to learn, gain work experience and exchange knowledge with their farmers**. The mix of young and old enhances that knowledge transfer. They connect with local farmers and producers to design and develop business, marketing and sales strategies to **improve the SFSC's competitiveness**.

Cost-benefit analysis

This **cost is high** (>€10,000). However, it does ensure a stronger connection with consumers.

Improving the value proposition

The parties involved in the short chains (farmers, businesses and consumers/citizens) form the basis of a **connected marketing campaign**. **Early customers are the starting point for making the leap to the larger consumer segment**. This is a high value, as such innovation can be applied to all kinds of foods and can also be also **used as a marketing claim**.

5. General best practices for implementing innovation

Based on the analysis of the 6 most important characteristics of the successful innovations established by SMARTCHAIN (see Section 3.3), 6 general recommendations/tips/best practices were identified for implementing innovation in SFSCs: (1) collaboration is key; (2) 'low-cost' innovation can make the difference; (3) seek innovations that work in other regions, countries or sectors; (4) select innovations that really add value to your product or service; (5) think of consumers; and (6) take advantage of innovation for marketing (Figure 6).

Figure 6. The 6 best practices for implementing innovation, according to the analysis done in SMARTCHAIN.

Collaboration is key. Stakeholders are commonly involved in the innovative solutions successfully applied in SFSCs. SFSC initiatives are characterised by a low number of employees and low human, technical and economic resources. If an SFSC initiative aims to resolve any problem or improve performance through innovation, a clear recommendation is to contact the stakeholders that have the required knowledge/experience/resource that is not present in the organisation. The process is easier when the SFSC initiative has built up a multidisciplinary network of contacts since it was established.

Sometimes **innovations with 'low cost' can make the difference**. SFSC practitioners commonly associate innovation with a ground-breaking and 'high-cost' solution. However, innovation is not always related to such a solution: the problem can sometimes be easily resolved by applying a simple innovation with a relative low cost. Furthermore, considering the commonly low financial resources of SFSC initiatives, the application of a high-cost innovation can be very difficult. It may completely revolutionise the way of producing or selling and provide a clear competitive advantage, but the risk of failure can be very high. Thus, in the SFSC context it is usually better to move the focus to 'low-cost' innovation, resolving problems and improving products and services step by step. It is less risky and the SFSC practitioners can learn during the process: **innovation must be considered as a continuous process**.

Seek innovations that work in organisations from other regions, countries or sectors. If a problem has already been resolved there is no need to waste time developing a completely new solution. There are problems that are common to the companies from other sectors, regions or countries. Investigating how they deal with these common problems can be a good and quick way to find an innovative solution or obtain inspiration. Of course, if the applied solution is industrially protected by a patent or a similar method, it is first necessary to contact the owner to apply for a use permit or patent licence. Related to the first recommendation (collaboration is key), a good network of contacts from different regions of the country, or even from other countries, can be a catalyst to accelerate the process.

Prioritise innovations that really add value to your products and services, **innovations than can differentiate your company from your competitors**. Independently of production sector, a company always has different problems or points for improvement, which can be resolved by different innovative solutions. Sometimes, those problems/points of improvement may be associated to organisational or internal topics not directly linked to food quality or how sales are made. Due to the SFSCs' low resources, it is recommended that priority be given to the application of innovations which can be directly associated to improvements in food quality, sales price, value proposition and the relationship with consumers and/or which can be positively valued by customers. They can clearly differentiate the organisation from the competition.

Think of the consumers. Consumers are often neglected by small food companies. SFSC farmers and producers are normally centred on what they are experts in: to produce the best possible products in the best possible way. Thus, they normally think of innovation in terms of reducing production costs or improving food quality. However, as in all types of business, the customers, the consumers, must be the cornerstone. There are numerous examples of companies that produced the best products in their respective sectors but fell into crisis or even disappeared because they neglected the consumer relationship and marketing. A successful company pays attention to the consumers of its products and listens to them. Thus, a good recommendation for SFSC initiatives is to invest in innovations that improve the relationship with their consumers, enable the production of foods that are truly aligned with their necessities and facilitate consumer purchasing. **The closer the relationship with consumers**, **the easier it will be for them to value your products** over those of your competitors (even if they are more expensive) and **the easier it will be for them to become regular buyers** (an essential factor).

Take advantage of innovation for marketing. It is recommended that innovation be used as a marketing claim: it should be a crucial topic in the communication strategy of the SFSC initiative. In the 21st century, consumers have more shopping options than ever before, so it is essential to engage them using all available tools. **What is not communicated does not exist**. If a company does not communicate its innovations, how will the customer be able to value them? We live in an era in which the internet and social media have revolutionised social and business communication. Communicating and connecting with consumers has never been easier. A good recommendation is to communicate through **the company website and social media** that an innovation has been implemented, trying to indicate how it can be useful/interesting for consumers (new sales channel, new way of connecting with them, new format, new recipe, new packaging, increase shelf life, etc) and how it differentiates the company from the competition (the only company that applies it in the

region, the first company that sells its products in the region through this sales channel, etc). Furthermore, **the products' packaging and labelling can also be used for communicating and marketing**: the key innovative features should also be highlighted here.

6. Best practices guide: a step-by-step path to innovation

Based on SMARTCHAIN results, especially the analysis and best practices for innovation in SFSC (see Sections 3 and 4) and the analysis of features of SFSCs in Europe (see Section 2), a methodology based on **a step-by-step path has been created to innovate in SFSCs**. The know-how of the authors, the bibliography, and the lessons learnt from the SMARTCHAIN case studies were also used as a source of information.

The idea of this methodology is **to guide and help the internal work that should be done by the farmer or small producer on the road to innovation**. It basically consists of 6 steps:

7) **Know your SFSC initiative;**
8) **Know your surroundings and your clients;**
9) **Identify your bottlenecks and success factors;**
10) **Seek and identify innovative solutions;**
11) **Select the innovative solution based on cost-benefit analysis;**
12) **Implement the innovative solution and go to market.**

Each step usually groups a set of questions (to be answered by the SFSC practitioner) and recommendations for taking each step (and preparing for the next ones) in the best way possible. These sets of questions and recommendations aim to cover and highlight the most important **regional/local effects**, especially those associated to economic, environmental, legal-governance and socio-cultural indicators, and **the role of the different stakeholders** of the value chain. In step 4 (seek and identify innovative solutions), **knowledge transfer recommendations** have been included not only to provide advice to SFSCs but also to try to improve communication and interaction between SFSC practitioners and stakeholders (e.g. research and technology providers).

Innovation is always associated to a non-negligible risk of error, especially in the long term. The **sustainability of the competitive advantage** provided by an innovation is conditioned by multiple factors (consistency with the company's long-term objectives, expense forecasts, tolerance of failure, favourability of the situation, professionalised human team with permanent training, market trends, competitors' behaviour, supporting stakeholders, etc). Following the SMARTCHAIN step-by-step path will not assure that the innovation will be 100% successful in the short and long terms, though it will **increase the probability of fruitful innovation**, assuring that it is aligned with the problems, needs, markets, regional/local environment and business model of each SFSC practitioner.

Based on the experience of the SMARTCHAIN partners, **the following general points and recommendations should be considered before starting on the path of innovation**:

- ✓ **The more information, the better**. It is recommendable to collect as much business information as possible before starting on the path, especially for steps 1 and 2. SFSC initiatives that have, among others, a sales register, clear business model and mechanism to obtain feedback from customers will find the process easier;
- ✓ **The more people involved in the process, the better**. It is recommendable that everyone involved in the SFSC initiative participate in the process, or at last one representative from each company department or field of knowledge (marketing, farming, post-harvest processing,

administrative, etc). This is especially important in steps 1, 2, 3 and 4. When possible, **also invite key stakeholders** (taking precautions with respect to confidential data);

- ✓ **Several sessions are required**. Due to the complexity of the work, it is impossible to do it properly in one day. From a general perspective, probably at least one or two sessions (around 3-6 hours in total) are needed to complete steps 1 to 3. Steps 4 to 6 require more work and, consequently, more sessions. The sessions required as well as the timeline may vary, depending on the difficulty of the problems/needs found in the step 3 and the previous experience of the SFSC initiative, among others (the existence of a solid business model, previous experience implementing innovations, marketing knowledge/skills, etc). The whole process can take weeks, in the case of a ready-to-implement innovation, or years, in the case of major technological innovation involving rescaling in step 6 and large investment in tests and equipment;
- ✓ **Use an innovation canvas**. To facilitate conceptualisation and follow-up of the proposed step-by step process, the use of canvas concept (Figure 7) is recommended. This is even more relevant in steps 1 to 4 or when many people are involved in the analysis. The best way is to prepare large sheets of paper for each step, hang them on a wall at the SFSC facilities and then fill them in during the different sessions, using markers, pens or post-its. Of course, a software solution (presentation program, graphic design software, etc) could be used for this purpose;
- ✓ **Use a facilitator or moderator.** This person will be responsible for preparing all things required to do the work, organizing the sessions with all the people involved, explaining the work to be done and collecting the results. It could be an SFSC initiative worker who uses this guide as an instruction booklet. In any case, the presence of an **external facilitator** with previous experience in business, marketing and innovation could speed up the work a great deal. That person could be an expert from local government, technology-research centres or farmers associations.

Figure 7. Innovation canvas proposed for the step-by-step path to innovation of SMARTCHAIN.

6.1 Step 1: Know your SFSC initiative

The first step on the road to innovation is to know what **the business model of the SFSC initiative** looks like.

In certain cases, due to their limited resources, farmers or small producers are not clear about their business model or about all the properties/features of their products and services. This situation happens mainly with SFSC practitioners (1) who have always sold their products to the same few intermediaries and are starting with SFSCs, (2) who have sold products only via traditional short channels (farmers' markets, on-farm sales, etc) as a complement to the main business (sale to an intermediary) and (3) who do not have appropriate business or marketing skills/resources. Conversely, the largest SFSC initiatives with a good level of professionalism and enough resources to have a marketing department or a management department, could easily complete this step.

The regional effect could play an indirect role in the difficulty/ease of completing this step, since it is related to the level of business skills. The large professional SFSC initiatives located close to crowded towns and cities in industrialised regions of Europe are probably very familiar with their respective business models and do not need to put a lot of effort into this step. However, it may not be as obvious for a small farmer in a mainly rural region who sells some of the respective farm production to friends and neighbours and wants to innovate in SFSCs to improve competitiveness. The following proposed guidelines thus basically apply to this type of small SFSC producers.

First, it is suggested that the business model be prepared using the **canvas model** (Osterwalder and Pigneurr, 2010), because it is a very adaptable and easy-to-follow methodology. From a general standpoint, the business canvas model consists of filling in the information and data needed for 9 different blocks: (1) value proposition, (2) customer segments, (3) customer relationships, (4) channels, (5) key partners, (6) key activities, (7) key resources, (8) cost structure and (9) revenue streams. To obtain more information about the canvas business model in the SFSC context, the SMARTCHAIN "**Best practice guide for improved business performance in SFSCs**" can be consulted[19].

To collect the key data and information needed, and facilitate the internal reflection process that the SFSC initiative must undertake, based on the SMARTCHAIN results **a list of more than 100 questions** has been grouped in 8 sets (see Appendix C):

1) **Description of the products and services (value proposition);**
2) **Customer segments;**
3) **Sales channels;**
4) **Customer relationship and communication;**
5) **Description of key partners;**
6) **Description of key resources and activities;**
7) **Finance and revenue streams;**
8) **Cost structure.**

These questions consider, among others, regional/local, economic, environmental, legal-governance and socio-cultural factors associated to the business and the stakeholders of the SFSC initiative. This list was designed as a starting point. Thus, depending on the specificities of the SFSC initiative, the list may be complemented with more questions and/or the questions may be modified.

[19] For more details, please refer to Deliverable 7.4 of the SMARTCHAIN project.

To answer some of the questions, it is vital **to know exactly how much and when each product/service is provided and sold during the year**. For that purpose, a production and sales register (account ledger) must be kept.

Furthermore, if there is no **specific data about the composition of the SFSC products**, it is advisable to contract a service of a private laboratory, university or technological centre that can compile it. Depending on product type, value proposition and market competition, it is crucial to quantify the possible pros and cons of the products with respect to the competition.

6.2 Step 2: Know your surroundings and your clients

The second step in this innovation process comprises **the scouting and knowledge of the business surroundings, including the market, competitors, and customers** (consumers, restaurants, caterings services, specialty retailers, etc) of the offered products or services.

This research about the company's surroundings is essential to understand **market opportunity**, determine the **customers' perception of the business,** identify **the company's strengths and weaknesses** and determine **the respective needs and problems**. For example, an SFSC initiative may have more than 30 years of experience and a solid business model based on a good product with a PDO (certified quality), yet the competition may be implementing a better marketing strategy and producing cheaper, with similar quality. The current market niche for the SFSC initiative may be so small that the stability of the company is at risk in the medium/long term. The same thing could happen if the consumer perceives the SFSC initiative negatively because, for example, it cares less about the environment than the competition or pays its workers less, even though the price of its products is higher. In addition, **the characteristics of the market, competitors and customers may limit the possible innovations to be implemented or reduce their likelihood of success**. For example, an SFSC initiative may want to open an online shop due to the global increase in online sales during the SARS-CoV-2 pandemic; but its top competitor may currently have one that is excellent and already has a loyal following.

A good starting point for this analysis could be to answer questions like the ones presented in Appendix D (some resemble the ones answered in step 1, customer segments). To answer many of these questions and obtain the highest possible quantity and quality of responses, at the very least **market and consumer research is required**, **and to have a method for obtaining consumer feedback**. If the SFSC initiative does not have the knowledge and skills for that purpose, they can be subcontracted or supported by private marketing companies, technological centres or universities. Of course, undertaking or subcontracting them may be difficult for small SFSC initiatives with low personal and financial resources. In any case, some **general recommendations** can be provided to try to obtain the necessary data and information:

- ✓ **Contact and join sectorial associations at national and/or regional level**. They normally conduct their own market/consumer research and consumer surveys and/or prepare annual reports on the market for a specific product (dairy foods, juices, organic food, etc). They may thus be a good source of data to learn the general characteristics of the market;
- ✓ **Check public statistics and reports about food consumption and prices**. Eurostat publishes data and reports at European and EU country level[20]. Furthermore, national and regional governments usually conduct annual consumption surveys which provide useful data. For example, the Spanish

[20] Eurostat (https://ec.europa.eu/eurostat/web/main/home)

government annually publishes comprehensive data about the consumption of different foods on its website[21];

- ✓ **Consult the reports of the European Consumer Association**[22]. The website of this association contains specific reports about different topics and trends in the Food Sector;
- ✓ **Use Answer the Public or Google Trends**[23]. These websites provide information about what people are querying in Google. A limited number of consultations can be made each day;
- ✓ **Use Google Analytics**[24]. This tool can be used to **analyse data traffic of your website**, enabling users to be better informed about their customers. Google Analytics provides you with information to get to know your users and to learn how they interact with your website, with your content, sections or products. There are also other similar tools, both free and paid;
- ✓ **Establish a method for receiving customer feedback (suggestions, needs and complaints)**. Although the cost of this is relatively low, the information obtained may be very important. Select one or several ways (contact email, WhatsApp group, online questionnaire in your website, telephone, etc). This can be highlighted in your website and in the label of your products. Of course, a record should be kept of all of them so they can be analysed individually and as a whole. Different free or paid tools, like SurveyMonkey[25], can be used to help make online questionnaires.
- ✓ **Facilitate and encourage consumer feedback about your products**. You may be able to award discount vouchers to people who provide you with feedback about your website or respond to a short questionnaire.

6.3 Step 3: Identify your bottlenecks and success factors

In this step, an internal exercise must be done by the SFSC initiative to **find all the bottlenecks (problems, needs) which can be resolved or mitigated by innovation, and the success factors (competitive advantages) which can be improved or further exploited by innovation.** After that, **they must be prioritised** to decide which one/s will be addressed in the next step. To do this work, it is suggested that the following consecutive phases be conducted:

1) **Evaluate the competitive position of the SFSC initiative**, based on the step 1 and 2 results;
2) Based on that evaluation, **identify the bottlenecks and success factors**;
3) **Prioritise and select the most important bottlenecks and success factors to be addressed**.

In this step, it is especially important to involve as many people as possible to ensure that all bottlenecks and success factors are detected and that they are prioritised appropriately.

Evaluate the competitive position of the SFSC initiative

In steps 1 and 2, different questions are provided for knowing and understanding the business model, the market, the customer segments and the competitors of the SFSC initiative. To evaluate the competitive position of the SFSC initiative, it is necessary to **analyse all the collected responses and unanswered questions** (a lack of information or omission can lead to conclusions that are sometimes more important than the information collected). This analysis can be conducted for the identification of 4 kinds of competitive factors:

[21] Statistics about food consumption in Spain, published by the Ministry of Agriculture, Fisheries and Food of the Spanish Government (https://www.mapa.gob.es/es/estadistica/temas/estadisticas-alimentacion/consumo-alimentario/)
[22] European Consumer Association (https://www.beuc.eu/publication/position-papers)
[23] Answer the Public (https://answerthepublic.com/) Google Trends (https://trends.google.com/trends)
[24] Google Analytics (https://analytics.google.com)
[25] SurveyMonkey (https://surveymonkey.com)

strengths, weaknesses, opportunities and threats. This analysis is commonly named **SWOT** (Figure 8) and is widely used in the business context.

Figure 8. General scheme of the SOWT analysis (strengths, weaknesses, opportunities and threats) to be done for analysing the competitive position of an SFSC initiative.

Strengths are the internal things that are carried out well in the SFSC initiative, the elements that are really the essential competitive points (a strong marketing plan, large benefits, a fully equipped production plant, the use of a certified quality label, the best-known producer of the specific food in the region, highly loyal customers, a very well-known brand, entire production sold without difficulty, etc).

Weaknesses are the elements/areas that are not carried out well in the SFSC initiative, due to internal/structural handicaps (lack of knowledge, no resources, small production, production seasonality, short product shelf life, etc). These elements/areas need to be improved or resolved to optimise the business and improve the competitive position (debts, no marketing, cannot sell all production, high production costs, lack of consumer engagement, no market data, microbiological problems, etc).

Opportunities are external factors or circumstances that have a positive influence on the competitive position of the SFSC initiative (a consumption trend, increase in local shopping due to the SARS-CoV-2 pandemic, increased population, lower taxes, government subsidies for the sector, competitor closure, etc). They can be current or in the short-, medium- or long-term future.

Threats are external factors or circumstances that can potentially negatively affect the competitive position SFSC initiative (temperature increase due to climate change, an economic crisis, new legal restrictions in a couple of years associated to the use of fertilisers, the presence of a new competitor in the region, higher energy prices, crops pest, depopulation, etc). Like opportunities, they can influence the SFSC at present or in the short-, medium- or long-term future.

To carry out the SWOT exercise, the best is to **progress systematically,** identifying the specific strengths, weaknesses, opportunities and threats of the SFSC initiative for **each of the set/blocks of questions in steps 1 and 2**: (1) description of the products and services (value proposition); (2) customer segments; (3) supply channels; (4) customer relationship and communication; (5) description of the key partners; (6) description of key resources and activities; (7) finance and revenue streams; (8) cost structure; and (9) business surroundings – market, competitors, and customers.

After the identification process, it is useful to **list the strengths, weaknesses, opportunities and threats in order of importance**. If different people are involved in the exercise, a voting round can be organised to agree on the order of the strengths, weaknesses, opportunities and threats.

Identify bottlenecks and success factors

According to the work done in the SMARTCHAIN project[26], the strengths, weaknesses, opportunities and threats must be studied carefully to detect the **company's bottlenecks and success factors**. Bottlenecks and success factors can be converted to improvement options by the application of technological, non-technological and social innovations.

Bottlenecks (problems, needs) **are outcomes of weaknesses** that can hamper exploitation of an opportunity to improve the SFSC performance (**Weakness-Opportunity**) or increase the impact of a threat, reducing the SFSC performance (**Weakness-Threat**). Most of them can be eliminated or reduced by innovation. Typical SFSC bottlenecks can be found in Section 2.6 and Appendix A.

Success factors (competitive advantages) **are outcomes of strengths that can be improved or further exploited by an innovation** to (1) support exploitation of an opportunity to improve performance of the SFSC (**Strength-Opportunity**); or (2) eliminate or reduce a threat that can decrease/spoil the company's performance (**Strength-Threat**). Typical SFSC success factors can be found in Section 2.7 and Appendix B.

Some bottlenecks may be interconnected, having one primary problem and several secondary problems arising from it. It may sometimes be difficult to discover the original problem (the main cause) and what is a consequence. The recommendation is to deal with this in the next phase, identifying in this phase every problem/need (interconnected or not) as a bottleneck. The same applies to success factors.

Prioritise and select the bottlenecks and success factors to be addressed

The last phase of this step is to rank bottlenecks (problems/needs) and success factors (competitive advantages) to select those whose resolution, mitigation or consideration could improve the SFSC's competitive position.

First, it is useful to **analysis the influence of each bottleneck and success factor in the different key aspects of the business model and surroundings that are associated to the SFSC's competitive position** (which correspond with each of the set/blocks of questions in steps 1 and 2): (1) value proposition of products and services; (2) customer segments; (3) supply channels; (4) customer relationship and communication; (5) key partners; (6) key resources and activities; (7) finance and revenue streams; (8) cost structure; and (9) business surroundings – market, competitors and customers. To that end, it is necessary to respond questions like the following:

- ✓ Is it linked to the **value proposition of your products and services**? If yes, how does it influence them? Does it concern all your products and services or only one/some of them?

[26] For more details, please refer to Deliverables 2.2 and 2.3 of the SMARTCHAIN project.

- ✓ Does it concern your **customer segments**? If yes, how does it influence them?
- ✓ Is it linked to your **supply channels**? If yes, how does it influence?
- ✓ Does it concern how you **relate and communicate with your customers?** If so, how does it influence this?
- ✓ Is it associated to your **key partners, stakeholders and network**? If yes, how does it influence them?
- ✓ Does it concern how you produce and your **key activities**? If yes, how does it influence them? Is it associated to all your key activities or only one/some of them?
- ✓ Is it linked to your **key resources** (economic, infrastructure, personal, knowledge)? If yes, how does it influence them?
- ✓ Is it correlated to **the cost** of your products/services? If yes, how does it influence it? Can this be quantified?
- ✓ Is it connected to your **revenue streams and profit margins**? If yes, how does it influence them? Is it possible to quantify this?
- ✓ Does it **only affect you or the whole sector** at local/regional/national/European level? How? Has it already been resolved by your competitors?
- ✓ What is the time dimension? Does it **affect you already or will it do so in the short- or medium-long-term**?
- ✓ Is it **obligatory to address it because of an external reason** (a new legal requirement, mandatory requirement of a key client, etc)?

After responding these questions, it is useful to try to **evaluate the impact of the bottleneck or the success factor for each of the analysed aspects** (value proposition, customers segments, supply channels, communication with your customers/consumers, etc). For example, a scale from 0 to 4 can be used, where 0 indicates no influence, 1 low influence, 2 medium influence and 3 high influence; 4 indicates those that it must absolutely be resolved (a new legal requirement, crop pest, microbiological problem with products, etc).

Different bottlenecks and success factors are usually associated to various aspects with different levels of importance. For example, if there is a lack of consumer engagement, it affects not only customers/consumers, but probably also the sales channels (which may not be the good ones) or the relationship with consumers (probably a lack of communication). In general, **the more important the bottleneck or success factor, the higher the score it will receive and the more aspects it will affect.**

6.4 Step 4: Seek and identify innovative solutions

After in-depth analysis of the business model and value proposition (product or service), finishing the market discovery effort (customers and competitors) and identifying the most important bottlenecks and success factors, the next step is to **seek and identify potential innovative solutions that can resolve or mitigate those bottlenecks (problems, needs) and improve or further exploit those success factors (competitive advantages).**

Based on the SMARTCHAIN results, especially those corresponding to technological, non-technological and social innovations[27] and the general recommendations for implementing innovation (see Section 5), **two general recommendations** for seeking information about potential innovations result: **talk with people in your network and use the SMARTCHAIN innovation platform**.

[27] For more details, please refer to Deliverable 2.2, 2.3, 2.4, 3.2 and 3.3 of the SMARTCHAIN project.

Talk with people in your network

The **contact network** can play a crucial role in identifying innovative solutions:

- ✓ **Talk with other farmers and producers**.
  - Regardless of whether they produce the same products as you or belong to the same association, talking with other farmers and producers and sharing information can be beneficial (1) for finding common problems and needs; (2) for identifying innovative solutions and; potentially, (3) for sharing equipment and/or solutions for common problems/needs;
  - A farmer of the network may have had the same problem as you, applying an innovative solution that can also help resolve your problem;
  - Contact with other farmers and small producers from other regions and countries may also be a great help when seeking innovations applied in your sector;

- ✓ **Talk with local and regional governments**.
  - Regional and local governments, especially departments associated to rural development and food production, can be a good source of advice to identify innovations. In some cases, they work in close contact with farmers, so they have the experience of several similar cases and are familiar with cross-cutting problems and needs;
  - If regional and local governments do not have a specific advisory service, they can sometimes provide the contact information of public and private entities involved in food innovation in your region;

- ✓ **Talk with food-related technological and research organisations.**
  - Public or private entities, such as university faculties/departments, research institutes and technological centres are at the top of the innovation pyramid, so they can support you in the process;
  - Most such entities have a website with a great deal of information about their research topics, projects and publications (scientific and non-scientific). Valuable information can be found simply by reviewing it;
  - It is usually easy to contact researchers and technicians. The respective contact information is supplied in the website, including name, telephone and email. Do not hesitate to contact them. If they cannot help you, they can probably at least pass on a contact who can;

- ✓ **Talk with your suppliers and providers of technologies.**
  - You are surely in contact with the necessary suppliers and providers of raw materials (including ingredients), packaging materials, logistic services, fertilisers, pest control, agricultural machinery, food processing machines and packaging machinery, etc. If some bottlenecks or success factors are associated to some of those aspects, do not hesitate to contact them;
  - They also supply other farmers or producers, so they have a cross-functional vision and perspective of the sector and respective problems;
  - They are also continually innovating to offer better products and resolve the problems of their clients; they may be able to recommend a new product, ingredient, material or machinery to resolve your need;
  - Sometimes they also work with companies from other sectors (food-related or not), so they may also be able to provide a solution or recommendation resulting from their experience;

- ✓ **Talk with other people in your network who are not involved in your business.**
  - Tell your story to your friends. Sharing information and problems usually provides new perspectives on the problems and different solutions. You never know where inspiration may come from.

Use the SMARTCHAIN innovation platform

In the SMARTCHAIN project an **online innovation platform** was created, including different tools and resources on innovation in SFSCs[28]. More information about it can be found in the Section 8. Two actions are especially recommended for identifying innovations:

- ✓ **Consult the inventory of SFSC innovations[29].**
  - More than 140 technological, non-technological and social innovations have been compiled. They are briefly described, including contacts and providers, etc;
  - The innovations cover a broad spectrum of topics, so a potential innovation can probably be found for each of the bottlenecks and success factors detected (agriculture and primary production, food safety and hygiene aspects and regulatory issues, food quality, food preservation and other processing technologies, logistics, food integrity, traceability, transparency, labelling and marketing concepts and communication tools, etc);

- ✓ **Check all the supporting information and tools of the platform.**
  - Review the inventory of SFSC initiatives[30]. A specific inventory of SFSC initiatives, including producers, associations, etc, has been created on the platform. You can consult it to obtain ideas and information regarding innovative approaches in the SFSC context in your country or of other European countries;
  - Consult the publications and weblink lists[31]. A specific set of public documents and weblinks with interesting information about SFSCs can be found in the platform. They can help you in the innovation process, expanding the network of contacts and other sources of potential innovations;
  - The training section of the innovation platform[32] contains outcomes from the Innovation and Solution-based Multi-actor Workshops held in 9 European countries (France, Germany, Greece, Hungary, Italy, the Netherlands, Serbia, Spain and Switzerland). All presentations used by the different hub managers during the workshops, containing the main results and findings of the project, are available in 9 different languages. Additionally, the training section includes the 5-week e-learning course on Best Practices in Short Food Supply Chain Innovations (starting on Monday, 24 May 2021).

6.5 Step 5: Selection of the innovative solution based on cost-benefit analysis

In this step, **all the identified innovative solutions for addressing prioritised bottlenecks and/or success factors must be analysed to select the innovation to be implemented**.

[28] SMARTCHAIN innovation platform (https://www.smartchain-platform.eu)
[29] SMARTCHAIN innovation inventory (https://www.smartchain-platform.eu/en/innovation-inventory)
[30] SMARTCHAIN SFSC initiatives inventory (https://www.smartchain-platform.eu/en/initiative-inventory)
[31] SFSC publications and weblinks (https://www.smartchain-platform.eu/en/resources)
[32] For more information, please refer to the training section of the SMARTCHAIN innovation platform (https://www.smartchain-platform.eu/en/training)

It is recommended that each innovation be analysed in a specific **cost-benefit study from a multi-angle perspective**. The classic cost–benefit analysis weighs differences in **revenues, direct cost and transaction costs** for companies between use of the old versus the new way of working to achieve an outlet for specific quality products (Verhaegen and Huylenbroeck, 2001). This approach is centred on translating everything into **monetary impacts** (cost reduction, cost increase, lower/higher water/electricity needs, less/more labour cost, more benefits, cost of new machinery, etc). However, the **non-monetary impacts** (social impact, marketing impact, health benefits, improved wellness of workers, legal requirements, new skill requirements, etc) are of special relevance in the SFSC context and must also be considered.

Cost analysis

A detailed cost study includes not only the cost incurred by incorporation of an innovation but also the costs resulting from the innovation, regarding human resources, changes in the company and possible infrastructure-related investment, etc.

Based on all the above, for a more in-depth cost analysis, questions like the following should be asked and answered:

- ✓ What is the direct cost of the innovation? Taxes?
- ✓ If a loan is needed to implement the innovation, what are the conditions?
- ✓ What is the indirect cost? Is any kind of supplementary investment required?
    - Materials – compressors, laptops, scanners (metal, x-ray, etc), sensors, personal protection equipment, software, etc;
    - Intellectual property – licences (software, patents, processes, etc);
    - Facility modifications – changes in walls/rooms, connectivity, energy power increment, compressed air, water, vapour supplies, office, production plant and warehouse furniture, human safety, etc;
    - Human resources: specific profile of people (operator with knowledge in a new technology, marketing expert, etc). Is any training course needed?
    - Cleaning costs;
    - If the SFSC initiative does not have the necessary skills/knowledge, is it necessary to subcontract a technology centre or similar organisation to implement the innovation? What is the estimated cost?
- ✓ Does the innovation have any maintenance costs? What is the cost of spare parts? Is there a maintenance service nearby? Is it good?
- ✓ Does this innovation change something associated to your transaction costs (time, negotiation power, transport, etc)?
- ✓ Does this innovation increase the environmental impact of your business (generation of wastewater, production of waste, etc)? What is the cost of managing this? There is a tax related to that?
- ✓ Does this innovation produce something to be tested/certified by third parties (security certification by a third party, validation of the new plant/equipment/process by a third party due to legal requirements, analysis of the food by a third party to be sure that it complies with legal requirements, etc)?
- ✓ Does this innovation imply more bureaucracy/paperwork?
- ✓ Is the innovation approved by the authorities or institutions that regulate the sector (regarding a new ingredient, new packaging material, new processing technology, etc)? If not, what is the cost (financial and time) of the respective authorisation?
- ✓ Do European/national/regional/local regulations and legislations affect the innovation's implementation cost (cost of the permits/certifications from authorities, cost of paperwork, etc)?

- ✓ Do European/national/regional/local regulations and legislation affect the time needed for full implementation of the innovation (time required to obtain the necessary permits/certifications, etc)?
- ✓ Is there a need for legal counsel? What is the estimated cost?
- ✓ Is it possible to share the direct and indirect cost with other farmers/producers?
- ✓ Can this innovation be funded by a crowd-funding process (rewards or equity)?
- ✓ Is there any grant or financial support from European/national/regional/local government level associated to incorporation of this type of innovation? What kind of support (loan, subsidies)? When is it paid? What are the requisites for obtaining this support?
- ✓ Based on the innovation's complexity, how long do you estimate it will take to implement it? Is this time affordable or not?
- ✓ Is there a chance that the innovation will resolve the problem but give rise to a new one? Is the risk high or low?

Benefits analysis

When analysing benefits that may be obtained using an innovation, some questions should likewise be asked and answered, such as:

- ✓ Does the innovation have a low/affordable price for the SFSC initiative?
- ✓ Does the innovation entail any direct or indirect discounts (permanent discount for further purchases, carriage paid, etc)?
- ✓ Does this innovation solve or mitigate any other problems of the SFSC initiative? Could it be the first step in another innovation?
- ✓ Is there a reduction in the cost of the production process (less energy, less production time, less labour, fewer ingredients, less cleaning, less water, etc)?
- ✓ Does this innovation facilitate logistics or reduce cost (longer shelf-life, no refrigeration, less heavy or more resistant packaging, etc)?
- ✓ Is this innovation associated to increased sales (new supply channel, clear consumer need, sale in a new town, new market niche, etc)?
- ✓ Does the innovation allow a higher product price (higher quality, new premium recipe, etc)? Will customers appreciate the innovation? Will they be convinced to pay more for products?
- ✓ Does the innovation apply to only one of your products/services or to all of them?
- ✓ Can this innovation reduce taxes (lower taxes due to investment in innovation, lower environmental taxes, lower taxes associated to the creation of new jobs, etc)?
- ✓ Does the innovation reduce the company's environmental impact (less water, less energy, less waste, less chemicals, less plastics, etc)?
- ✓ Does this innovation bring customers and consumers closer (improved relations with consumers, more potential customers, increased transparency, etc)?
- ✓ Does this innovation facilitate the work and life of your customers and consumers (easier purchase process, new sales channel claimed by your clients, lower price, reduced time between purchase and delivery, new payment method, new return policy of the company, easier use of the product at home, improved knowledge or skills, etc)?
- ✓ Does this innovation improve the consumer's health (less sugar, less fat, etc)?
- ✓ Does this innovation improve the work, health and/or life of your employees (reduced working hours with same salary, reduced hazards, improved knowledge and skills, etc)?
- ✓ Does this innovation provide you with 'extra time' (more time for marketing, more time for friends and family, etc)?
- ✓ Can this innovation be shared with other SFSC farmers and producers in your network?
- ✓ Will this innovation improve integration of your SFSC initiative in local society? Does it increase your social recognition?

- ✓ Does this innovation result in competitive advantages over your competitors (product differentiation, differentiation in the market, building team, new connections with relevant stakeholders, higher quality, unique marketing claim in the region, lower price, etc)?
- ✓ Is this innovation is difficult for your competitors to replicate?
- ✓ Can it be used as a marketing claim in the product label (transparency, social claim, environmental, animal welfare, etc).
- ✓ Does this innovation provide an advantage, considering the market growth trends (vegan products, new protein sources, less plastics, natural foods, etc)?
- ✓ Does this innovation help meet any current legal/mandatory requirement? Is this innovation necessary to meet a legal requirement that will take force in the next few years?
- ✓ Does this innovation provide benefits in terms of management (easier sales process, easier accounting, better market knowledge, increased management knowledge, etc)?
- ✓ Does this innovation imply less bureaucracy/paperwork?
- ✓ Does this innovation facilitate external or internal bureaucracy/paperwork?

Selection of the innovative solution

In brief, having answered the previous questions (and other related ones), an SFSC farmer or producer will have a better understanding of the major impact, in terms of cost and benefits, of implementing an innovation.

For each of innovations that can potentially resolve a bottleneck or exploit a success factor, it is advisable to draw up **two lists, one of benefits and one of costs, trying to rank both costs and benefits in order of importance**. All the information should then be carefully studied to **select the optimal innovation** among those detected.

The **selection process is complex**, as there are **too many factors at play** (economic, social, environmental, etc) whose prioritisation and weighting in decision-making depends on the **characteristics of the SFSC initiative**, especially its size, value proposition and principles (mission and vision). For example, the price of an innovation could be cheap for one SFSC and totally unaffordable for another. Furthermore, depending on the SFSC value proposition and principles, an innovation that can resolve a problem while also reducing environmental impact or improving employees' health may be a key point to rate (even if price increases) or may not be relevant. Based on the SMARTCHAIN results regarding successful factors for innovation in SFSCs (see Section 3.3), the general tips for implementing innovation (see Section 5) and the partners' experience, some **recommendations for selecting the best innovative option arise**:

1) Where possible, **quantify costs and benefits** (better to use figures than words like high or low);
2) **The more complete and more realistic the information**, especially with respect to quantification of costs and benefits, **the more likely it is that the right innovation will be chosen** and the **lower the risk of failure** due to an overlooked or miscalculated key factor;
3) **The more people who can participate, the better. A multi-actor point of view is fully advisable** (farmers, processing plant workers, commercial staff, administrative staff, carriers, etc). For example, a vote can be held using a scale from 0 to 4, where 0 indicate that it is too costly for benefits and 4 that it has too many benefits and low costs;
4) If you are in doubt about which innovation to select, **remember to ask your contacts, especially research and technology associations and organisations**, for help**.** If possible, try to convince some of them to participate in the selection process;
5) **Innovation is not necessarily associated to high cost.** If you have two possible options, the expensive is not necessarily the best;
6) **Prioritise the innovation that really adds value to your products and services**, the innovations than can differentiate your company from your competition;

7) If several possible innovations are similarly ranked, **prioritise the innovation that can improve the relationship with consumers – consumer engagement.**

6.6 Step 6: Implement the innovative solution and go to market

Once the cost-benefit analysis is done and the benefits outweigh the costs, it is time to **implement the technological, non-technological or social innovation** in the SFSC initiative. Thus, depending on the kind of innovation and its scope, it is also time **to launch the new or improved products or services on the market**.

To **maximise the chances for successful implementation and marketing**, **monetary savings** and **avoiding resource waste**, an **implementation and go-to-market plan with realistic stages, timings and go/no go points** is required (Figure 9). This plan should include the logical minimum progress phases that would enable evaluation of an innovation's impact:

1) **Plan design**. To identify the metrics to measure achievement of expectations in the different stages and phases;
2) **Validation**. To verify that the innovation complies with the requirements, that its application is technically and economically feasible and that the results meet expectations (pilot scale);
3) **Demonstration**. To show that the innovation resolves the problem in a close-to-real operating environment (industrial scale), including first market check;
4) **Go to market**. To define the market launch of the new process or service.

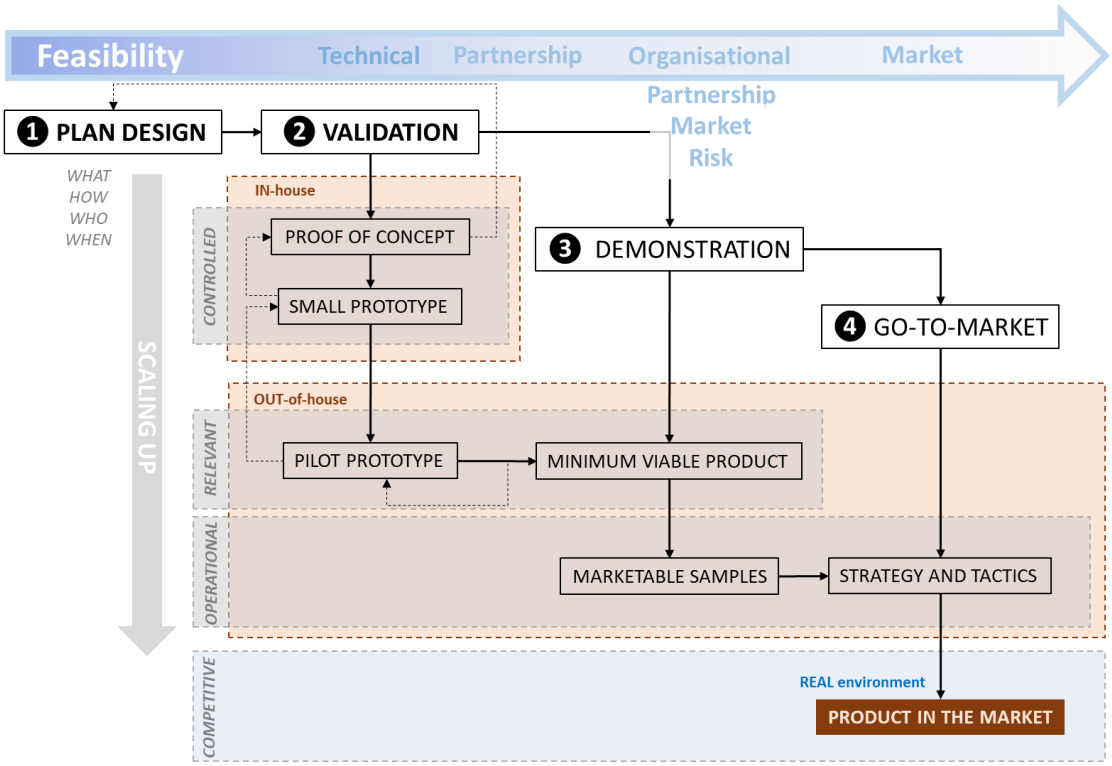


Figure 9. General diagram of the implementation and go-to-market plan proposed for innovation in SFSCs.

During these different stages, **the feasibility of the innovation in scenarios increasingly closer to reality must be done**, what is known as **scaling-up**. To make that, it is necessary to define different

prototype levels of increasing complexity (proof of concept, small prototype, pilot prototype, minimum viable product, market sample).

The prototyping is an easily understandable step in **technological innovation**, usually involving a technology with a direct impact on the SFSC products or services. In this case, the various scaling-up stages can differ regarding the size, form or scale of the processing equipment (laboratory, pilot, industrial scale), level of subcomponent integration, resemblance to final product, production flow (kg/h) or quantity of goods produced, etc. But the prototype concept is also broad, encompassing **non-technological and social innovations**. Their scaling-up stage can be determined by factors such the level of engagement and involvement of the upstream, sidestream and downstream external actors (providers, other departments of the organisation, partnerships, consumers, etc), the number of people involved and the different website sections uploaded to the web, etc. An example of non-technological innovation could be a new company logo. In the case of first level of prototyping, an example could be a homemade drawing of the new logo, receiving feedback from a few trusted customers in personal conversations. The prototype level can gradually advance, involving more customers, including feedback from the previous comparison, subcontracting a graphic design company, printing some copies and using the new logo in some products, etc. An example of social innovation could be the organisation of social events for consumers. Regarding the latter, an initial prototype could be the organisation of one event with selected consumers, then scaling up the number of events or attendees.

Before beginning a more in-depth explanation of the different proposed implementation and go-to-market plan stages, some **general recommendations and considerations** can be highlighted:

- ✓ Implementation should be based not just on **technological aspects**, but also consider the **market, organisation, and partnership aspects** (Lan et al., 2010);
- ✓ To establish mechanisms to ensure that the innovation will be (1) **accepted by the customers**, (2) **accepted or properly integrated by workers** and other personnel in the organisation (in the event of structural changes) and (3) **sustainable for the company in long term**;
- ✓ Regarding acceptability by customers and workers, a good strategy is **to develop the easiest version of the resulting innovation and make comparisons with them before spending too much time on the matter**. This is especially important when the innovation's cost is high (new processing equipment, new harvesting machinery, etc). It is advisable to find **'early and key adopters'** (key customers, key partners along the chain, staff, etc) as soon quick as possible to receive get valuable feedback and iterate to create better versions;
- ✓ **A robust and sound implementation and go-to-market plan is still important**, **even if the innovation is not directly reflected in a new or improved products or services** to be marketed and does not impact the value proposition (new internal reorganisation, new management software, etc);
- ✓ **Previously identify all expected features and improvements of the innovative solution in order to validate them**. Throughout implementation, check to make sure the envisaged properties and improvements actually occur when applying the changes the innovation is based on. It should also be possible to demonstrate these strengths at this phase (marketing);
- ✓ The implementation plan must enable sufficient information to be obtained, not only to verify that the expected improvements have been attained but also to **check/predict at each stage the innovation's sustainability for the organisation** and prepare to **successfully cross the market entry chasm**;
- ✓ **Establish go/no-go criteria throughout the plan.** From the concept and first prototype through to market launch, clear criteria must be determined to decide whether or not to continue the process. Hence, if the results are not as expected in a given stage, the process must provisionally pause to analyse all aspects and determine whether there is a problem with the plan's design (failed test design, early adopters not properly selected, etc) or with the innovation itself (the advantages demonstrated on a small scale are lost when scaling up, higher than projected cost of implementation, the innovation

resolves the problem but creates a non-expected new one, etc). If the problem is directly associated to the innovation the process must be stopped and it would become necessary to go back to step 5 of the guide and select a new potential innovation. If the problem is associated to the plan's design, the latter can be redesigned, repeating the respective stage again;

- ✓ **If needed, involve appropriate stakeholders in the process.** The SFSC initiative probably cannot go the whole way alone. It is advisable to check the network and surroundings of the SFSC initiative to identify the organisation(s) (university, technological centre, association, marketing company, etc) that can help you establish the plan and carry it out;
- ✓ Results at any level of the implementation and go-to-market plan can even serve as a starting point to **obtain support from governments** (financial, facilities, etc) **and/or from potential collaborators/investors** for further develop or progress with implementation;
- ✓ **The plan should be adapted for each innovation and each SFSC initiative.** The plan should be tailor-made. The flowchart of Figure 9 should be adapted to the specific innovation and characteristics of the SFSC initiative. It could be very simple and short (a low-cost innovation already successfully tried by a farmer of the network) or very complex, covering 2 years (a high-cost innovation leading to a complete change in production method).

Design of the implementation plan

The first stage of the plan is to design the plan itself, **identifying metrics to measure the achievement of expectations in different stages and phases** as objectively as possible. Only by determining appropriate performance indicators will it be possible to verify whether the selected innovation is feasible and can function well in the SFSC initiative and to demonstrate what the core functions are and their impact on the value proposition.

First, **the plan's scope must be defined and adapted** to the specific circumstances. Sometimes it will not be necessary to go through all the stages in depth. Thus, the number and complexity of the stages and prototyping levels of the physical representation of the innovation during the scaling-up process (proof of concept, small or pilot prototype, minimum viable product) will depend, among others, on the type of innovation (technological, non-technological or social), the initial readiness of the innovation, the investment needed until obtaining a market (usually more in technological innovations), the SFSC's characteristics and the current competition. SFSC initiatives must therefore **answer questions** like what follows:

- ✓ Has the innovation already been validated by a third party? Do you have access to the results of this validation? Stage 2 of the plan (validation) may not be necessary; if so, you can therefore move directly to stage 3 (demonstration);
- ✓ What is the cost of implementation? If it is low, the economic risk if the process fails is also low, so the stages can be simplified to go to market as soon as possible. Conversely, if the innovation's cost is high, it may be a good idea to go slowly and move to the next stage only when clearly possible;
- ✓ Does this innovation have a major impact on your organisation? If the innovation is associated to major changes in your organisation the plan should be more complex than if the innovation were just a simple update or replacement of a current procedure.

Once the scope has been defined, ***what, how, who and when*** should be answered, not only to ensure reliable information but also to provide sufficient resources to accomplish the implementation and establish a respective timeline:

- ✓ What are all the **features of the innovation** and which ones are **critical or decisive?**
- ✓ What are the **stages** that need to be included in the plan?

- ✓ What will be the **reference model** (a product, a process, a service, an instruction, an internal procedure, etc)?
- ✓ What will the **up-scaling levels of the reference model for the different stages be** (proof of concept, small or pilot prototype, minimum viable product)? How will the solution more closely approach reality? What are the successive forms that it will have (physical prototype, place, document, session, website, etc)?
- ✓ What are the **expected changes with respect to your products and services or your organisation**?
- ✓ What will be the quantifiable **performance indicators** to be measured, which can porvide valuable information about achievement of the expected changes (organoleptic properties, nutritional properties, environmental impacts (waste, CO_2 emissions, etc), shelf-life, number of consumers involved, consumer engagement level, sales, production cost, etc)?
- ✓ What will the **go/no go criteria** be for each performance indicator (20% cost reduction, product shelf-life extended by at least 10 days, 20 participants in an event, 10% increase in processing yield, etc)?
- ✓ How will the implementation **stages** be carried out? It is advisable to determine **milestones** from which to infer general and more specific **tasks and actions** that should happen to make possible the validation, demonstration and go-to-market stages;
- ✓ How will **performance indicators be measured and monitored**? It is necessary to determine the method (sensory analysis with an internal panel, physicochemical analysis, registered sales, number of consumers registered for an event, device to continuously measure electricity consumption, weighing of waste generated each day, etc);
- ✓ Who will be **in charge of each defined task**?
- ✓ Who will be **in charge of measuring each performance indicator**?
- ✓ Who will **be in charge of deciding whether to go further or not**?
- ✓ Who is the **target user** of the innovation and the reference model? The target commonly comprises the consumers of the product/service. But the innovation's target can also be the SFSC staff or local authorities, etc;
- ✓ Who are the **external stakeholders** that must participate in the different stages? How and when will they participate?
- ✓ When will **each stage, task and action be performed**? Set start and end dates, determine and set **dates** for **periodical meetings** to control the status of achievements and progress of the actions (e.g. by checklist) and to detect and unblock potential bottlenecks, etc;
- ✓ When will **performance indicators be measured and monitored**?

Once the plan has been designed, it is possible to move on the next stage. In any case, it must be stated that the plan can be redefined in any of its aspects to complete any of the validation stages. **The design is thus something that can be updated and redefined according to the circumstances and results of the different stages of implementing the innovation**.

Validation of the innovation

The validation stage of the implementation journey involves **verifying that the innovation complies with the requirements, that its application is technically and economically feasible and that the improvements meet expectations**.

During validation the 'how' questions must thus be answered: **how** the innovative solution **will be made, how it will look, how it will function** and **how the target user interacts and reacts** to the overall experience with the new product/service/procedure/structure/process/instruction. All of this is verified by:

1) **Putting into practice** the innovation during **different up-scaling phases**, increasing the relevance of the results and the engagement of actors and stakeholders;
2) **Measuring** the **performance indicators** in the **reference models** (whether prototypes, processes or consumers) set out in the implementation plan's design;
3) **Analysing** the results of **performance indicators** and the scenario in which testing was carried out. (How did the test compare to expectations? What problems, if any, were encountered? What are/were the plans, options, or actions to resolve problems before moving to the next level?);
4) **Deciding whether to proceed to the next stage** of implementation, based on the plan's go/no-go criteria.

During the validation, different up-scaling phases and levels of a reference model associated to the innovation (a product, process, service, instruction or even internal procedure) can be tested. Initially, **3 up-scaling levels are proposed**: proof of concept, small prototype and pilot prototype (Figure 9). Some examples can be found in Table 3.

The proof of concept is used to ensure that **the innovation can be applied** and that **it meets initial expectations (initial feasibility)**. It can be defined as **a quick check step** before kick-starting full validation of the innovation. This first move in the up-scaling process makes particular sense if the innovation is associated to a completely new concept for the SFSC initiative (new processing step, new product, etc) and/or it has a high cost even at early stages (new equipment with a high price, need for a new production plant, etc). Hence, if the results of the proof of concept are not good, the innovation process can be stopped without excessive consumption of the SFSC initiative's resources. The proof of concept would make no sense if the innovation has been implemented by a partner of the SFSC or its cost is low and affordable.

The proof of concept is typically a small internal project. The **proof of concept must be simple**; it may be a unique unit that can be produced using available technologies, facilities, and resources (new recipe (new ingredients) produced at kitchen level, modification of the variables of a process, etc), with or without the assistance of an external stakeholder. Thus, it may also be a preliminary test at the facilities of an innovation supplier, technology transfer centre or similar organisation. Aspects such as performance, usability, full features and all other customer-facing elements are not considered at this stage of the validation. In a relatively short time and employing few resources, a proof of concept can also help draw in stakeholders and investors for the next stages of the innovation's implementation.

Table 3. Possible prototypes for the validation and demonstration of 3 examples of technological, non-technological and social innovation: proof of concept, small prototype, pilot prototype, minimum viable product and market/demo sample.

	Technological	Non-Technological	Social
Example case	Application of a new process (pasteurisation/ drying/freezing) to increase product's shelf-life	New organisation's logo to show the value of the product and attract consumers	New space for cultural/social/training activities, to connect business with consumers
Proof of concept	Product prepared, processed (pasteurisation, drying or freezing) and packaged using kitchen appliances (very low production, for example only 1-2 kg). Initial sensory quality (max. day 0+2) could be validated in a small (5 to 10 people), internal or external test (pool of trusted consumers).	Preliminary logo designed in-house or by a third party. It can be verified by a few key workers and/or customers (how they perceive it, whether they like it better than the old logo, what they would change, etc).	First cultural/social/training activity held on company's facilities with a few selected consumers (for example, max. 10 people). This will help size up the organisation's needs, spaces, detect failures and points of improvement for future activities/events, etc.

	The potential longer shelf-life could be assessed using on-site tools (mould appearance, odour, pictures, aspect, etc). *Note: do not consume the product if corresponding microbiological analysis has not been carried out.*		
Small prototype	Cooked/dried/frozen product using lab-scale (small) equipment (low production, maybe around 10 kg). Initial technical feasibility check. Optimise product's recipe (ingredients) and processing parameters to provide the highest initial quality. The potential longer shelf-life and quality's evolution during storage could be further assessed (sensory analysis, microbiological analysis, physicochemical analysis, etc). Analyses should be outsourced if the company does not have the necessary resources. *Note: to perform sensory test microbiological analysis will be necessary*	Logo redesigned according to initial feedback gathered during the proof of concept. Check the logo in the usual package of the company's products. It can be affixed in different places on the packaging and/or using different sizes and colours. It can also be checked with printing experts at the company's packaging supplier to see which configuration is technically most suitable, as well as whether the new logo involves changes to the packaging material/process.	Second cultural/social/training activity held on company's facilities with a higher number of selected consumers (for example, max. 15-20 persons). The results of the proof of concept can be used for improving this second activity. This will help refine the organisation's needs, spaces, detect failures and points of improvement for future activities/events, etc.
Prototype pilot	Cooked/dried/frozen product using pilot-scale equipment (for example, around 10 to 50 kg batches, 10 to 100 kg/h) The needed equipment could be rented or subcontracted. Re-optimise product's recipe (ingredients) and processing parameters to provide the highest initial quality. Packaging should be better defined than in the previous prototyping level. The potential longer shelf-life and the quality's evolution during storage could be further assessed, using more sampling points and making more analyses. Analyses can be outsourced. *Note: to perform sensory test, microbiological analytics will be necessary*	New logo redesigned according to feedback gathered during the previous phase. Packaging machinery adapted to the new logo, or logo samples printed in the demo-room of the packaging provider. It can be verified again by a few key workers and/or customers (how they perceive it, whether they like it better than the old logo, what they would change, etc).	Third cultural/social/training activity held on company's facilities, with a number of consumers close to the final target (for example 25-30 persons). Invite key consumers and friends. This will help refine the organisation's requirements, detect new failures and points of improvement for future activities/events, etc. After this prototyping phase, it is necessary to decide if the activity will be done in company's facilities or it is necessary to hold it in a third-party space.

Minimum viable product	Cooked/dried/frozen product using industrial-scale equipment (for example, around 100-200 kg batches, 100 to 500 kg/h). This could be done with purchased equipment or by using tolling services. Prototype obtained by preparation, processing and packaging under realistic production conditions in terms of coverage of, among others, future capacity requirements, expected operators on the line, significant operating hours, and expected raw material variability. Process adjustment could be required to reach quality obtained in the previous validation steps.	Package with the logo printed in the final way and stuck on a more significant number of units (20 to 50), with the colour, size and location validated in the previous phases. It needs to be tested with a larger number of consumers. It can be presented at a fair or at usual point of sale, showing units with the new logo and others with old one (same packaging and grammage). You can ask consumers to fill in a survey to find out which one they like best.	Cultural/social/training activity held in the company's adapted premises or in a third party's premises, with a number of consumers close to the final target (for example, 25-30 people). Use the final place to hold the activities.
Marketable/demo samples	Samples of a small production run, carried out under conditions based on the Minimum Viable Product, can be used to test the innovation at market level by presenting it at high-impact events or fairs.	Small run of units (100-1,000) printed with the new logo to be distributed to selected points of sale to study their actual impact on sales over a representative period (for example, 6 weeks).	Cultural/social/training activity held in the company's adapted premises or in a third party's premises, open to the public (e.g. maximum 30 people). Attract potential attendees by advertising on your website and shop, using your network, etc). It could be a good idea to check how many of the attendees have bought your products, find out what they think through a survey, etc.

The next level of the up-scaling process is the **prototyping phase**, following the proof of concept, but with a higher degree of complexity. It serves to **validate the innovation's strategic design direction**, **to discover errors and make changes**; it also helps **test how the target user interacts and reacts** to the overall experience with the new product, service or procedure, etc. During this phase, different levels of prototype complexity can be assessed, including resemblance of the final product/service, final capacities and final scenario of the respective use. Initially, at least 2 levels could be tested, a **small prototype** (low production, laboratory conditions, small equipment, low involvement of the final user) and a **pilot prototype** (large production, conditions closer to industrial ones, pilot equipment, high involvement of the final user).

The involvement of technology suppliers, R&D centres and other stakeholders is usually essential in the prototyping phase. As in the proof of concept, the tests can be done at the facility of an innovation supplier, technology transfer centre or similar organisation (e.g. testing a processing technology with your own product). If the innovation involves the implementation of technology, the technology can be purchased in several steps, either by acquiring higher-capacity equipment units or by duplicating the small line. It is

sometimes possible to rent the equipment in a first step and to discount the money invested in the final purchase. Larger print runs will enable **consumer tests** to be conducted with a pool of people (do they perceive and appreciate the differential features of the new product/service compared to conventional one?) and to balance costs, determine the next scale-up parameters, detect bottlenecks, simulate process performances, ensure clean and safe procedures, organise production and assess waste and collateral streams, etc.

Demonstration of the innovation

In the demonstration stage, **it must be proven that the innovation solves the problem in a close-to-real operating environment**, **including first market check**.

In the calling-up process, 2 levels are defined in this stage: the **minimum viable product** and the **market/demo sample** (Figure 9). Somes examples can be found in Table 3.

A **minimum viable product** is the one produced **in a close-to-real operating environment** (pre-industrial or industrial scale), from which it is possible to acquire relevant information and data to **ensure that results obtained in the validation stage are maintained at industrial scale**. It can be used to attract customers and validate a product idea early in the product development cycle.

The **market/demo sample** is the next step to be accomplished, if the results achieved with the minimum viable product are as expected. It serves to **initially check the product/service in the market before the full launch**. As the minimum viable product, it is produced in a close-to-real operating environment (pre-industrial or industrial scale). There are different ways to show that the innovation works at market level. The demonstration sometimes involves just one single high-impact event/act, to show that something exists or is true by giving proof or evidence in a competitive environment (market testing with a select group of customers, presentation at a fair, etc). It is never too late to abandon before the launch involves more commitment.

At this stage, ideally **all the key information and activities needed to prepare the go-to-market should be known, including** among others the **specific needs and requirements of customers**, **price** of the new product/service, **partnerships required** and **supply channels**. Furthermore, based on all the information and data collected it is fully appropriate to establish the **foreseen sales and profit** based on the marketing plan and to evaluate all the **risks of market failure,** preparing a contingency plan to resolve them.

Go-to-market

In the event that **the innovation is associated to a product or service** that is or will be sold by the SFSC initiative, **the final key and obvious stage is go-to-market**, the market launch (Figure 9).

To assure a higher probability of success, a revised **marketing strategy and tactics** must be developed, also including a plan with **go/no go criteria to stop commercialisation if the results are not as expected**. This operational plan must include different tasks that need to be fulfilled, timing for each and who is the responsible for them. A good go-to-market strategy should consider and cover the following essential aspects:

YOUR BUSINESS OBJETIVE

To define the objective of the business, three questions must be answered: Why, How and What. **Why** is the purpose of the business, the impact you want to have on the world with your business. It determines how you are going to achieve that (**How**) as well as your product (**What**). It is now the time to look at what your goal

is. Your business objective must be SMART: **specific, measurable, achievable, realistic, and timely** (Doran, 1981) (Figure 10).

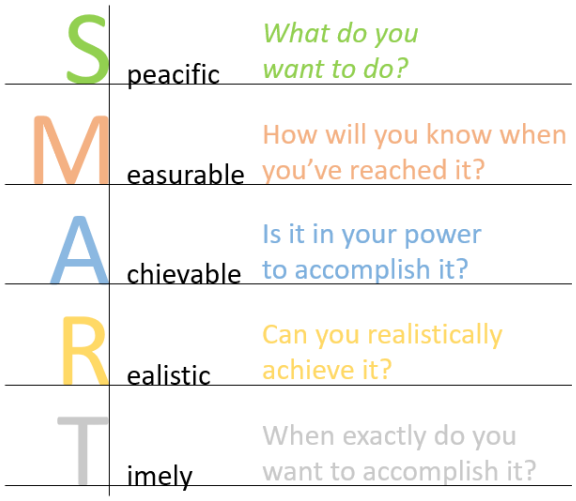


Figure 10. SMART characteristics that the business objective of an innovative product/service should accomplish.

YOUR MARKETING OBJECTIVE

The marketing objective must be set, taking a realistic scenario into account. For example, one marketing objective could concern the **amount of profit you need to generate in a specific timeframe**. The marketing objective will detail the milestones you need to pass to generate that profit. It is also related to the key performance indicators (this is further explained below).

YOUR TACTICS

Marketing tactics are the **actions you take that influence what will generate the desired results**. While the marketing strategy is about where you want to go, the tactics detail how you are going to get there. Your potential customers will go through different stages before choosing your product or service. Different models attempt to explain how the consumer decides to buy a product or service. The **AIDA model is one of the simplest and most used** (Rawal, 2013). It defines the customer journey to the purchase action through 4 steps: **awareness, interest, desire and action** (Figure 11). You must prepare your tactics for each step, attempting to help the consumer in the decision process.

Among others, here your goal is to identify **the supply channels** (on-farm sales, door-to-door, online shop, events, etc) and **marketing claims** that will help you get in front of your customers and generate the best results for your business. It is important to highlight here that in SFSCs it is more efficient to build relationships instead of just chasing transactions. By way of example, a fruit producer at a farmers' market who manages to sell pears with hail damage (small brown spots) at the price of top-quality pears. One tactic could be to sell them through direct contact with the respective customers, because this allows the reasons for the brown spots to be explained, convincing based on the taste of the intrinsic quality of the pears. In some cases (such as the SARS-CoV-2 pandemic), some forms of purchases (electronic ones) are better appreciated. There is an increasing demand for online ordering and home delivery services. Establishing online digital platforms, websites, to sell local products is a good solution to promote and sell the SFSC products, combining several marketing tools.

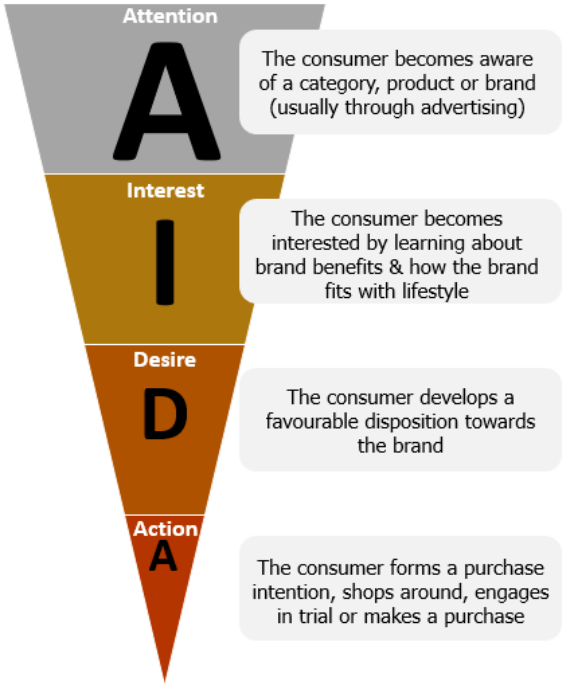


Figure 11. AIDA model defining the marketing sales funnel, the consumer journey to the purchase decision.

MEDIA ASSESSMENT

Media refers to the company's presence in different online and offline channels (owned, earned and paid media). They must be used to promote the new product/service and the innovation implemented by the SFSC initiative.

Owned media represents the company website, company blog, videos, catalogue of products with spectacular photos, social media page or group, newsletter, press review or online shop, etc. These channels usually provide a detailed description of the product's origin, ingredients, methods of preservation and nutritional value.

Earned media represents the attention that others generate for your product and brand without being paid to do so (shares of your content, social media mentions, etc).

Paid media represents the attention your brand and product receive when you pay to leverage a third-party channel (advertising, sponsorships, influencers, etc). You must be aware that sharing your story (storytelling) is by far the most underrated skill when it comes to business. It would be beneficial to explain the value of sustainability and the innovation implemented when creating your brand: consumer care, business customer care, positive differentiation in the marketplace, attraction of a motivated and committed team, etc.

COMMUNICATING AND MEASURING

One key part of the marketing strategy is **efficient communication** and obtaining **feedback from the consumers** to reinforce the business or change the way of doing things to make the business sustainable. **What is shared and how it is communicated must be simple, clear and very easy to understand**. For example, if the company claims a reduction in the CO_2 footprint, a strategy could be to put in the homepage the numbers that demonstrate this notion of environmental sustainability (tons of CO_2 or equivalent miles driven saved). Regarding the feedback from consumers, it can be useful to include in the website a space

where they can express their opinion/testimonials regarding the label or product, a contact address to receive opinion/complains and an assessment tool with different levels, etc.

DESIGN AND CONTROL YOUR KEY PERFORMANCE INDICATORS

The key performance indicators (KPIs) allow you to **track the development of your tactics and measure their performance.** In other words, they allow you to check whether your tactics are having the expected results in time. This is vital for your business; if you do not know where you are: how will you know if you have achieved your goal or how far you are from doing so?

Some important metrics can be the **number of sales**, **the number of signups** to an online marketplace, **average revenue per user** (ARPU), **customer churn** (the number of customers lost in a given time period), **revenue churn** (the amount of revenue lost in a given time period), **activity churn** (the number of users at risk of churning based on set activity: for example no sales for one month), annual returning revenue (ARR), monthly returning revenue (MRR), etc. It is not necessary to have too many. The crucial point is to **select the most suitable ones that can help you to control and manage** the marketing.

In parallel, it is required to **define go/no go criteria for each of the KPIs**, **to take the necessary corrective actions and, if needed, to stop the commercialisation if the results are not as expected**.

7. Innovation to redesign SFSCs to tackle the SARS-CoV-2 pandemic

Coronavirus disease 2019 (COVID-19), which is characterised by the severe acute respiratory syndrome, is caused by coronavirus 2 (SARS-CoV-2). It was first identified in December 2019 in Wuhan (China) and has since spread rapidly, evolving into a full-blown pandemic.

SARS-CoV-2 is spread through personal contacts and different routes including air, and contacts with different surfaces. The main protective measures are keeping personal distance, hygiene measures and wearing a mask. **To protect consumers from SARS-CoV-2 virus infection when purchasing food, several measures must be applied in all food chains, including SFSCs**.

Different types of food chains represent different levels of concern and risk of SARS-CoV-2 infection. As a consequence of the pandemic, consumption of local products has increased compared to imported products from the global food trade, leading to increasing demand in certain types of SFSCs. Demand has particularly increased for all types of home delivery services. At the same time, in other types of SFSCs, demand dropped significantly. This was due to consumers' fear of visiting crowded places, including shops and markets, where the possibility of keeping a safe distance is limited.

In SMARTCHAIN, **a method for assessing consumers' vulnerability vis-à-vis food purchases in SFSCs was developed**[33] (see Appendix E for more information). Through a systematic step-by-step analysis of the risk of consumer infection in each organisation, the high-risk steps in the supply channel can be determined. Through the application of an appropriate intervention in the high-risk steps, the risk can be eliminated or reduced. A database is provided on SARS-CoV-2 infection risks; it is regularly updated, since the currently available information is still fragmented.

The method is based on combining a simplified microbiological risk assessment, with an HACCP study. Risks of infection of consumers by SARS-CoV-2 are identified and calculated for each step of each type of SFSC (19

[33] For more details, please refer to Deliverable 2.2 of the SMARTCHAIN project. Inventory of technological and non-technological innovations: (solution ref. Number: T2.2.5)

different ones are considered). A simple scoring system was developed. The higher the risk, the higher the score. The steps in an SFSC representing high risk (where actions must be taken) can be identified. The specific SFSC can be redesigned to reduce the risks. The impact on the risk of consumer infection can be easily evaluated again and compared with the initial set-up. The risks associated to different SFSCs can be compared.

The tool comprises (1) a method for consumer infection risk assessment, (2) an inventory of hazards and guidelines for good practices and (3) SFSC redesign capability.

During the risk assessment, the frequency of SARS-CoV-2 occurrence during the steps of a specific SFSC is evaluated, considering the vulnerability of the protection to prevent the virus from entering the human body and the severity of the hazard. The following aspects should be considered during the study:

1) A flowchart of the steps of the SFSC should be prepared;
2) The hazard of infection of consumers during the step with SARS-CoV-2 and potential causes is analysed in each step;
3) Control measures currently in use should be described;
4) The frequency of occurrence of coronavirus (F) in this step shall be identified;
5) The vulnerability of the level of protection to prevent the virus from entering the human body (V) shall be identified;
6) The severity of the hazard (S) shall be identified;
7) Expected control measures to reduce risk during the acute coronavirus pandemic shall be described;
8) Expected control measures to be maintained after the coronavirus pandemic shall be described.

An easy-to-use method is thus available to evaluate the risk of SARS-CoV-2 infection of consumers when buying from SFSCs. The risk of consumers becoming infected with SARS-CoV-2 can be reduced through a systematic step-by-step risk assessment and by redesigning the operation with the application of necessary control measures.

Successful example: conversion of an open-air farmers' market in Dunakeszi (Hungary) to a drive-in one

After application of the method, **the open-air farmers' market in Dunakeszi** (Hungary) was transformed into **a drive-in market** and **different innovative measures were implemented**; they have effectively reduced the risk of infection (Figure 12):

- ✓ The available offering of small producers and SFSCs is showcased in the website. Customers can select products remotely in advance;
- ✓ Each customer is given an identification number at purchase;
- ✓ Customers can book a time slot for segregated drive-in service when they wish to collect the product;
- ✓ Pre-payment, payment by card, and cash payment in place can be applied. The keyboard of the payment tool is disinfected regularly;
- ✓ If the customer pays with cash, the necessary amount of money should be pre-calculated and put in a plastic bag to be handed over;
- ✓ The ordered goods are always placed in a specific ready location for the previously-booked time slot;
- ✓ The consumer can arrive by car at the place/market at the time booked, with the previously obtained order number;
- ✓ The handover of the products requires no personal contact. The products are loaded directly into the car by local staff;
- ✓ A safe distance is kept, the driver/customer can drive about 10 m and then check the package received;

- ✓ When the dedicated place for product handover is vacated, the next consumer with an order number and previously-booked time can occupy that space.

The traditional farmer market has **high risk on SARS-CoV-2** (crowded with people in a small area)

Drive-in market

	Frequency (F)	x	**Vulnerability** (V)	x	**Severity** (S)	=	**Risk**
Conventional farmers market	4	x	4	x	4	=	**64 (high)**
Drive-in farmers market	1	x	2	x	4	=	**8 (low)**

Figure 12. Risks before and after redesign of traditional open-air farmers' market in Dunakeszi (Hungary).

8. SMARTCHAIN innovation platform

The SMARTCHAIN Innovation Platform[34] facilitates knowledge, innovative practical solutions, and know-how transfer in the SFSC context. The platform particularly aims to:

- ✓ Generate, share and use information on suitable innovations;
- ✓ Engage stakeholders in the SFSC sector;
- ✓ Disseminate SFSC innovation and cooperation events;
- ✓ Organise training activities and generate training materials on best practices in innovation;
- ✓ Build an international community through a short food supply chain game.

The SMARTCHAIN Innovation Platform was specially designed for these stakeholders: **consumers, farmers and cooperatives, industry and retail, policy makers and technology providers**. Some content of the innovation platform is only available after the organisation registers (free of charge).

There is information about the different case studies involved in the project and the contact information for each innovation hub manager in the nine countries (France, Germany, Greece, Hungary, Italy, the Netherlands, Serbia, Spain and Switzerland).

Two inventories are currently available online. The **innovation inventory** corresponds to the different innovations detected; the **initiative inventory** comprises every SFSC initiatives detected by country and/or stakeholder.

Two sections of the platform are dedicated to knowledge. The first is named **RESOURCES**, with publications (internal or external) and interesting weblinks. The second is **TRAINING**, where all registered members can access:

- ✓ The outcomes of the "**innovation and solution-based multi-actor workshops**" developed in the 9 different European regions. All presentations used during the implementation of the different workshops are available in 9 languages. These presentations include the main results and findings of the project, as well as all generated recommendations and tips for farmers, food producers, entrepreneurs and other SFSC stakeholders;

[34] SMARCTCHAIN innovation platform https://www.smartchain-platform.eu/

- ✓ E-learning course (in English) on **Best Practices in Innovation**;
- ✓ A **video tutorial** on use of the SMARTCHAIN platform.

Definitions

Bottleneck (problem, need): the outcome of a weakness that can hamper exploitation of an opportunity to improve the SFSC performance (Weakness-Opportunity) or increase the impact of a threat, reducing the SFSC performance (Weakness-Threat). Typical SFSC bottlenecks can be found in Section 2.6 and Appendix A.

Innovation/innovative solution (in the SFSC context): a process by which a change is induced in current procedures, resulting in improved performance that provides a better 'value for money' and a sustained competitive advantage. Innovation must lead to a change; it does not have to be associated to an invention. To invent is to think, to innovate is to do, so the result of the innovation reaches the market and society. In this context, process is a very general concept that includes actions of different nature, such as to implement new technology, develop a new food product, use knowledge (already existing or new knowledge that can be acquired through advisory services or developed internally or through external collaboration), use effective management and commercial and/or control tools/software/strategies, etc.

Non-technological innovation: innovation that is not primarily driven by a technological invention or improvement. It is associated with areas such as marketing, organisation management and design. The term is not unproblematic, since a technology (for example information and communication technology) is used as an enabler to support most of today's innovations, even when technology is not the focus or driver of the innovation (European Commission, 2019).

Opportunity: an external factor or circumstance that has a positive influence on the competitive position of the SFSC initiative (a consumption trend, increase in local shopping due to the SARS-CoV-2 pandemic, increased population, lower taxes, government subsidies for the sector, competitor closure, etc). It can be current or in the short-, medium- or long-term future.

Short food supply chains (SFSCs): co-operative systems that include very few intermediaries, increasing sustainability, transparency, social relations and fairer prices for farmers and consumers. Such supply chains usually involve local producers working together to promote local food which, in many cases, only travels a short distance, so farmers and consumers can communicate with each other (internal working definition agreed by SMARCTHAIN partners)

Social innovation: a process that changes SFSC system by changing the relationships, perspectives, and ways of thinking and acting of the actors involved, leading to the achievement of primarily social goals that benefit all (of the SFSC actors). Social innovations bring about change (new relationships, new mentalities).

Strength: an internal thing that is carried out well in the SFSC initiative, an element that is really an essential competitive point (a strong marketing plan, large benefits, a fully equipped production plant, the use of a certified quality label, the best-known producer of the specific food in the region, highly loyal customers, a very well-known brand, entire production sold without difficulty, etc).

Success factor (competitive advantage): the **outcome of a strength that can be improved or further exploited by an innovation** to (1) support exploitation of an opportunity to improve performance of the SFSC (**Strength-Opportunity**); or (2) eliminate or reduce a threat that can decrease/spoil the company's performance (**Strength-Threat**). Typical SFSC success factors can be found in Section 2.7 and Appendix B.

Technological innovation: innovation that is primarily driven by a technological invention or improvement and comprises new product (good and service) and process and significant technological change of product (considerably improved) and process. An innovation has been implemented if it has been introduced in the market (product innovation) (OECD, 2015).

Threat: an external factor or circumstance that can potentially negatively affect the competitive position SFSC initiative (temperature increase due to climate change, an economic crisis, new legal restrictions in a couple of years associated to the use of fertilisers, the presence of a new competitor in the region, higher energy prices, crops pest, depopulation, etc). Like opportunities, it can influence the SFSC at present or in the short-, medium- or long-term future.

Weakness: an element/area that is not carried out well in the SFSC initiative, due to internal/structural handicaps (lack of knowledge, no resources, small production, production seasonality, short product shelf life, etc). This element/area needs to be improved or resolved to optimise the business and improve the competitive position (debts, no marketing, cannot sell all production, high production costs, lack of consumer engagement, no market data, microbiological problems, etc).

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Appendix A: Summary list of typical bottlenecks identified in SMARTCHAIN

Typical bottlenecks in the context of SFSCs as a whole

- ✓ low adaptability to changing demands
- ✓ difficult segmentation of niche products: limited number of possible customers
- ✓ communication skills of the producers: producers are unable to effectively communicate the products' authenticity and transparency
- ✓ price: consumers reject the higher price of SFSCs
- ✓ lack of product variety: limited choice
- ✓ production volume: not sufficiently large to manage the high costs of quality systems/labels
- ✓ limited marketing budget
- ✓ weak marketing activities
- ✓ weak marketing and communication tools: cannot reach consumers continuously and effectively
- ✓ limited knowledge about target consumer groups
- ✓ lack of understanding for differentiation of the products and services from conventional chains: lack of knowledge about the value for money concept
- ✓ lack of knowledge about food chain management
- ✓ low adaptability to changing demands
- ✓ lack of cooperation and low level of networking
- ✓ high costs of production, transport and marketing due to smaller volume
- ✓ individual producers alone are unable to introduce innovations separately
- ✓ generational gap: innovativeness, limited ambitious mentality, lack of open-mindedness and new ideas
- ✓ lack of combined use of complementary resources, skills, capabilities
- ✓ cooperative philosophy: complicated and slow decision-making
- ✓ competition: the SFSC actors fall behind the competition
- ✓ limited knowledge and experience on how to manage and develop human resources
- ✓ lack of professional staff for design and operation of the business model
- ✓ lack of business models for recruitment and human resources management
- ✓ lack of understanding and conscious use of business models as a tool for improvement
- ✓ rural development policy: does not operate as a support system for SFSC actors
- ✓ lack of available financial resources at EU and national level: barriers to investments and the use of innovative methods
- ✓ lack of specific legislation for SFSCs
- ✓ different interpretations of relevant legislation at EU level
- ✓ regulations on food hygiene, food information and various products: very complex
- ✓ farmers and producers unable to meet the requirements of regulations without the help of national and EU institutions
- ✓ operating food quality systems: very costly for small-scale producers
- ✓ lack of national regulations for quality: in some countries
- ✓ lack of understanding and proper interpretation of requirements
- ✓ lack of national regulation on a labelling system for local and traditional products in some countries

Typical bottlenecks in the context of individual steps of SFSCs

- ✓ lack of expertise: difficulties in achieving good quality of raw materials, lack of expertise regarding not just quality but also production methods, product development, adaption of new technologies, marketing, etc.
- ✓ unpredictable weather: in one year a surplus of products, in another a lack of raw material, high risks of drought, heavy rainfall, frost or hail
- ✓ lack of knowledge about farming and technology: difficult to find and apply innovative solutions
- ✓ perishable goods: no effective post-harvest technology in place
- ✓ ensuring the cold chain with cost-effective solutions: from farm to final consumer
- ✓ limited availability of technological systems
- ✓ limited availability of innovative solutions
- ✓ producers' lack of knowledge about technology: it is hard for them to identify the exact technological problems and solutions
- ✓ lack of investment in storage technology
- ✓ low negotiation power with large retailers and large service providing companies
- ✓ supply does not always match demand
- ✓ limited knowledge about the demand for new or traditional products
- ✓ seasonality: fluctuating product volume and quality
- ✓ meeting consumer needs and expectations: supply is not always sufficient for a demand-driven system
- ✓ lack of reliable information about local products and local production: consumers have less information
- ✓ prices: consumers compare the prices of SFSC products to conventional prices

Appendix B: Summary list of typical success factors identified in SMARTCHAIN

Typical success factors in the context of SFSCs as a whole

- ✓ authentic, local, traditional and quality products
- ✓ sustainable production
- ✓ organic production
- ✓ strong profile in social media and transparency
- ✓ easy and fair communication with consumers: website, social media
- ✓ common brand of producers
- ✓ promoting healthy and sustainable eating habits and diets
- ✓ following current food trends
- ✓ food chain management and networking
- ✓ employment of disabled and handicapped people
- ✓ common marketing: logo, website, presence in events
- ✓ interaction with different partners (e.g. agri-tourism)
- ✓ exploiting and combining fragmented and complementary resources to achieve strategic objectives
- ✓ operating a uniform quality assurance system
- ✓ close communication with members
- ✓ strategic collaboration with different institutions (e.g. territorial collaboration for developing territorial food systems)
- ✓ solidary participation of producers and consumers
- ✓ sharing economic responsibility
- ✓ experience and education, shared learning and innovation
- ✓ well-known in the local community
- ✓ acting as an interface to match the SFSC supply offering with customer demand

Typical success factors in the context of individual steps of the SFSCs

- ✓ high-quality local product
- ✓ fresh and natural product
- ✓ sustainable production and animal welfare
- ✓ authentic, traditional, cold-resistant
- ✓ diverse selling points, accessibility
- ✓ good marketing positions at local and international levels
- ✓ low transaction costs and fair price
- ✓ steep rise in consumer interest in purchasing from local and regional sources due to the SARS-CoV-2 pandemic

Appendix C: List of suggested questions to prepare the business model canvas

Description of the products and services (value proposition)

- ✓ Which products are sold by your company through SFSC initiatives? List them in order of importance for your business, indicating name, amount sold per month/year (t, kg), formats (e.g. 100, 500 and 1000 g), sale price, etc.
- ✓ Is the food of plant, animal or plant/animal origin?
- ✓ Is the product fresh?
- ✓ Is it a processed product?
- ✓ Is the product perishable?
- ✓ What is its shelf-life? Does it need cold/frozen storage?
- ✓ How is it packaged?
- ✓ What is the composition of the product? It is important to consider both positive and negative characteristics. For example:
  - Nutrients (vitamins, protein, etc). Have you analysed your product?
  - Is the product a special source of an essential nutrient/healthy component (any vitamin, high protein content, antioxidants, essential minerals (Ca, Fe, Mg, Se), etc)?
  - Does it contain any compound that could be harmful to health (pesticides, heavy metals (Hg, Pb) etc)?
- ✓ In it a product with different ingredients:
  - What is the formula/recipe?
  - Do you produce all the ingredients or do you need to buy some of them? Are all of them local?
- ✓ Is your product a regional/traditional speciality?
- ✓ Can it be directly consumed, is it an ingredient for ulterior use or both?
- ✓ Do you produce organic foods? If yes: which of your product groups (cheeses, vegetables, fresh dairy, etc) are organic? What % of your total production is organic?
- ✓ Do you have any legal/regulated/certified quality label (EU organic food label, PDO, PGI, national label (specify), regional Label (specify), local Label (specify) or any other (specify))?
- ✓ Do you apply specific measures to reduce the environmental impact of your production?
- ✓ Do you employ any claim for marketing purposes in the product label, company website, etc (local product, traditional product, product without additives, healthy product, natural product, chemical-free production, food only produced in your region, premium/high quality, low carbon footprint, use of a novel technology (specify), environmentally friendly, social claim (specify), for vegans, non-GMO, free-range, others (specify))?
- ✓ Is your product a regional speciality (e.g. a regional product)?
- ✓ Are your products based on any food trend (e.g. vegan foods)?
- ✓ Are your products for a particular niche population with a special need (religion, health, etc; gluten-free, allergen-free, halal, kosher, vegetarian, infant food, etc)?
- ✓ Which services are sold by your company through SFSC initiatives (cooking course, course on how to farm food, etc)? List them in order of importance for your business, indicating name, amount sold per month/year (e.g. number of courses), number of people involved, sale price, etc.

Customer segments

- ✓ Regarding the people who consume your products (consumers):
  - What are their characteristics?
  - Are there different consumer groups?

- Do consumer characteristics differ according to the channel used?
- Which channels do consumers prefer?
- Do your consumer groups differ by gender, age, etc?
- Where do they live? Urban/rural area?

✓ If you also sell products through an SFSC intermediary (restaurants, speciality retailers, collectives, etc):
- Who are they?
- Where are they located?
- What are their characteristics?

Supply channels

✓ What are your sales/distribution channels (own shop, cooperative shop, own online shop, online marketplace, door-to-door delivery (by phone or website), local markets, speciality retailers, consumer groups, vending machines, restaurants, collectives (hospitals, schools, etc), pick-your-own, community-supported agriculture, etc)?
✓ How much do you sell through each channel for each of your products?
✓ What is the cost of each of the channels?
✓ Why are these channels used and not others?

Customer relationship and communication

✓ Do you have a communication plan? What are its key points?
✓ What type of contact do you have with consumers?
✓ Are the different consumer groups targeted differently?
✓ Do you have any measures to increase consumer engagement/purchases?
✓ Do you inform your consumers about the distinctive features of SFSC products?
✓ Do you have a method for receiving consumer feedback on your products (comments in social media, phone number, consumer focus groups, online consumer survey, etc)?
✓ Do you have a 'customer care service'?
✓ Which marketing and/or communication tools does your business (actively) use (website, social media, radio or TV advertisement, flyers, promoted events, attendance of events/fairs for local food, etc)? If it does use them, please list them in order of importance for your business and provide a brief explanation.
✓ If you use social media, please specify which ones you use, ranking them by importance for your business and indicating the number of followers/contacts.

Social Media	Order of importance	No. of followers/contacts
Facebook		
Twitter		
Instagram		
LinkedIn		
WhatsApp groups		
Other		

✓ If you have a website or use social media, do you actively manage those channels? If the answer is yes, please specify how (by measuring visitors, followers; how they impact sales, etc).
✓ How is your product's label arranged? What information is in the label? Was it designed by a specialised company?

- ✓ Does the company have a logo? What is it? Was it designed by a specialised company? Is it shared with other farmers/producers?
- ✓ Why do you use these ways of communicating with your customers and not others? Do you know how customers want to be informed?
- ✓ Do you inform your consumers about the distinctive features of SFSC products?

Description of the key partners

- ✓ With which companies do you maintain signed/formal strategic partnerships (collaborators, alliances, joint-venture initiatives, etc)? List them in order of importance for your business, including name, location (region and country), what activities the partner(s) perform and the approximate number of interactions you have with each of them (monthly/annually). If needed, add more rows to the table.
- ✓ Which are your main suppliers? List name, location (region and country), what resources (seeds, fertilisers, packaging, etc) you acquire from the supplier(s) and the approximate number of interactions you have with each of them (monthly/annually).
- ✓ Who are your main buyers? Do you only sell your products directly to consumers? List them in order of importance for your business, including name, location (region and country), type (specialised retailer, restaurants, etc) and the approximate number of interactions you have with each of them (monthly/annually).
- ✓ With which governments/administrations do you have any kind of relationship? List them in order of importance for your business, including name, location (region and country), level (local/regional/national), nature of the relationship (local market organisation by small town council, grant or economic support, tourism initiatives coordinated by a local administration, invitation to working groups, invitation to fairs of organic products, etc) and approximate number of interactions you have with each of them (monthly/annually).
- ✓ Do you have any kind of relationship with other producers (farmer-to farmer network, membership in an association, etc)? If the answer is yes, please list the most important ones in order of importance for your business (name, location, what they do, kind of relationship and approximate number of interactions you have with each of them (monthly/annually).
- ✓ Do you share resources with any farmer or producer? Please specify what you share (farming machinery, storage facilities, fertilisers, seeds, common website, etc) and with whom.
- ✓ Do you have any connection with short food supply chain collaborative associations-initiatives? If the answer is yes, please list them in order of importance for your business, indicating whether they are local, regional, national or European initiatives.
- ✓ Do you have any connection with social/cultural/environmental associations-initiatives? If the answer is yes, please list them in order of importance for your business, indicating whether they are local, regional, national or European initiatives.

Description of key resources and activities

- ✓ Numbers of employees, including owner(s). People who work part-time or full-time under an employment contract, earning a salary. Include seasonal workers.
- ✓ Working hours per year, including hours spent by owner(s).
- ✓ What are the different departments of the company (management, administrative, marketing, etc)?
- ✓ What are the specific tasks of each person? What are the roles/kind of work done by the different people involved in the company (e.g. 5 farmers, 2 salespersons (include social media and website management), 3 administrative staff (include shipment management), 1 warehouse handler (also helps in the processing plant), 3 people at the processing plant, 1 general manager, 1 production manager)?
- ✓ What is the main infrastructure of the company (farming fields, buildings, own shop, etc)?

- ✓ Key technologies and machinery.
- ✓ For each product, describe the on-farm practices involved (planting, irrigation, pest management, harvesting, etc):
    a. How are they done?
    b. What are their main characteristics (including cost)?
    c. What are the variables/controlling parameters of those processes (e.g. irrigation time)?
    d. What is the cost of each process per product unit?
    e. What is the yield of each process?
    f. What is the environmental impact of each process (water consumption, energy consumption, etc)?
- ✓ What are the post-harvest processes involved for each product (mixing, peeling, cutting, thermal treatments, fermentation, filtration, bottling, packaging, etc)?
    a. How are they done?
    b. What are their main characteristics?
    c. What are the variables/controlling parameters of those processes (e.g. temperature and time in thermal processes)?
    d. What is the cost of each process per product unit?
    e. Which is the yield of each of the processes (e.g. peeling yield)?
    f. What is the environmental impact of each process (water consumption, energy consumption, etc)?
- ✓ What are the main activities associated to distribution of your products (e.g. logistics)?
    a. How are they done?
    b. What are their main characteristics?
    c. What is the cost of each activity per product unit?

Finance and revenue streams[35]

- ✓ Total annual turnover (€) of the company for the last 3 years. Total annual turnover: total amount of money a business earns in a year, including taxes, i.e. the sum of your total sales.
- ✓ Total annual profit after taxes of the company (€) for the last 3 years. The profit of your business after paying the corresponding taxes. This is mainly calculated as total annual turnover minus company costs minus taxes.
- ✓ For each product/service and the last 3 years, how much does the practitioner earn (profit) for each unit sold (€/t, €/kg, €/packaged product, etc)?
- ✓ Average profit margin (% with respect to sale price) of each of the products sold in the last 3 years. Profit margin (%): the difference between the total cost of making and selling something and the price as sold. For example, if the average sale price of product A is €1/kg and the total production cost (including materials, fertilisers, labour, insurances, marketing, etc) is €0.75/kg, the average profit margin of product A is 25% (€0.25/kg).
- ✓ Has the SFSC initiative received any kind of grant or financial support from administrations/governments/private companies (at local, regional, national, European level)? If yes, specify administration/government, programme/call, for what, year and amount (€).
- ✓ Do you benefit from any tax reduction due to your activity (employing handicapped persons, SMEs, local production, R&D, etc)? If yes, specify the reduction and the administration.

[35] If the company sells using SFSCs and conventional long chains, it is best to answer these questions considering both the whole company (SFSC+ non-SFSC), and then SFSC and non SFSC products separately. This is key to understanding the importance of SFSCs in the company and possible price differences for the same product depending on the sales channel, etc.

Cost structure[36]

- ✓ For each of your products/services and the last 3 years, what is the production cost for each product/service unit (€/t, €/kg, €/packaged product, etc)?
- ✓ Total annual costs including taxes (€) of the company for the last 3 years.
- ✓ Annual taxes (€) paid by the company for the last 3 years.
- ✓ Annual labour cost (€) for the last 3 years, including labour cost of owner(s) if there is a payroll.
- ✓ Annual material cost (€) for the last 3 years (seeds, fertilisers, packaging, etc).
- ✓ Annual operating consumption costs (€) for the last 3 years (oil, electricity, water, phone, etc).
- ✓ Annual building, equipment and machinery cost (€) for the last 3 years (including depreciation/rent).
- ✓ Annual cost (€) in patents and property rights (e.g. licences) for the last 3 years.
- ✓ Annual cost (€) associated to quality labels/certifications (e.g. organic certification) for the last 3 years.
- ✓ Annual cost (€) in research & development & innovation for the last 3 years.
- ✓ Annual cost in marketing activities for the last 3 years (website, advertisement, etc).
- ✓ Annual insurance cost for the last 3 years.

[36] If the company sells using SFSCs and conventional long chains, it is best to answer these questions considering both the whole company (SFSC+ non-SFSC), and then SFSC and non SFSC products separately. This is key to understanding the importance of SFSCs in the company and possible price differences for the same product depending on the production cost, etc.

Appendix D: List of suggested questions for knowing the SFSC's surroundings: market characteristics, competitors and customers

General characteristics of the market

- ✓ What are the main socioeconomic aspects of your selling zone/municipality/region?
  - Population
  - Population distribution by age/average salary/municipality or neighbourhood
  - Average salary
  - Salary distribution by age/municipality or neighbourhood
  - Rural/urban
  - Extension
  - Main food companies of your subsector
- ✓ What are the main cultural aspects of your region/municipality/sale zone with respect to food (consumption of more fish/meat/fresh vegetables than other countries/regions, food specialities, presence of native vegetable varieties or animal breeds, etc)?
- ✓ How much is the type/s of product/s or service/s you sell consumed in your sales zone/municipality/region?
- ✓ Which are the key stakeholders of the SFSC and/or your type of products/services in your sales zone/municipality/region? Do you have a relationship with all of them? If not, what is the reason?

Competitor profile

- ✓ Do you face a lot of competition in your sector?
- ✓ Have you noticed an increase in competition in the past 3 years?
- ✓ Who are your competitors (both long and short chains)?
- ✓ What are the characteristics of the products of your competition?
  - Do they sell cheaper or more expensive than you?
  - Are their products better or worse than yours?
  - Do they produce more or less than you?
- ✓ What is the key difference between their products and yours? Is it a matter of food characteristics and price or is there something else (human relations, good service, best marketing/promoting, etc)?
- ✓ Are these competitors in a better preference position compared to your company's offering company? Why?
- ✓ What are the strengths of the competitors?
- ✓ What are the weaknesses of the competitors?
- ✓ Are the competitors' products more attractive than yours? Why?
- ✓ What sales channels do they use? Are they the same as the ones you use?
- ✓ Do the competitors sell their products to other types of clients than you do?

Customer profile

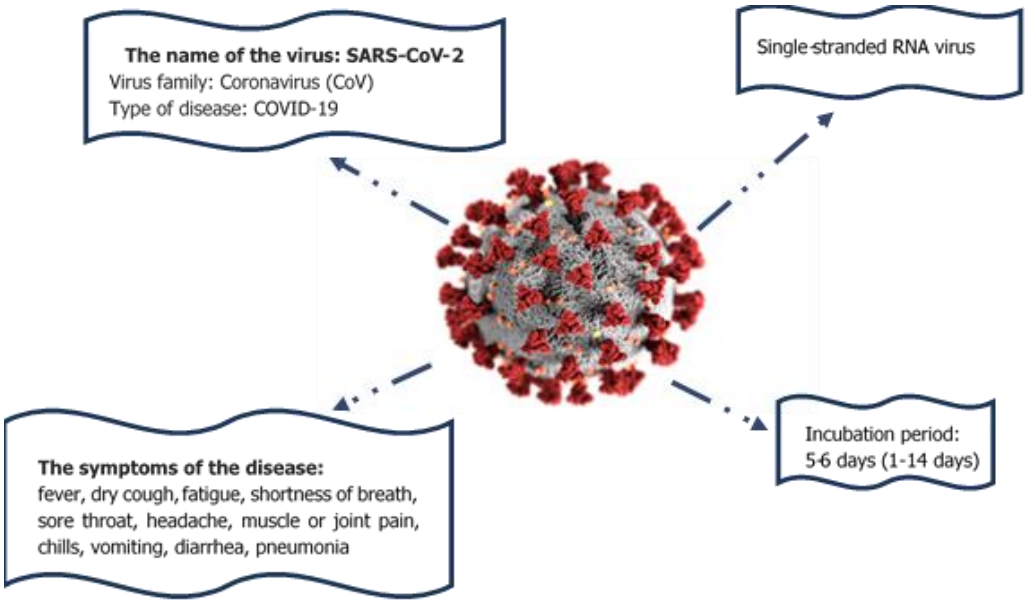
- ✓ Regarding the people who consume your products (consumers):
  - Who are your consumers?
  - Are there different consumer groups? Do your consumer groups differ by:
    - gender? If yes, approximately what percentage is female?
    - age? If yes, approximately what percentage are the age ranges of young (< 30 years old), middle-aged (30-55 years old), seniors (+55);

        - whether they live in an urban/rural area? If yes, approximately what percentage is rural/urban?
        - any other factors (interests, ethical issues, environmental, economic level, available time for shopping, etc). If yes, please give details and approximate percentage of total sales that this segment comprises.
    - Are they always the same or do they vary greatly over time? Are they loyal?
    - Are you paid well (on time and on budget)?
    - Regarding all these questions concerning consumers, can you answer them for each of the short food supply channels that you use? Do consumer characteristics differ according to the channel used? Which channels do consumers prefer?
- ✓ If you also sell products through an SFSC intermediary (restaurants, speciality retailers, collectives, etc):
    - Who are they?
    - Where are they located?
    - What are their characteristics?
    - Are they always the same or do they vary greatly over time? Are they loyal?
    - Do they always buy the same number of products?
    - Are you paid well (on time and on budget)?
    - Do you understand the purchase acts and patterns of each customer?
    - Do you have a list of potential customers you are not selling to yet? Who are they? Why do you not sell to them?
- ✓ Why do you think consumers/SFSC intermediaries buy your products? What are the most important factors/drivers/motivations for them when shopping for food products (freshness, taste, quality, price, convenience, human factor, etc)? Do those reasons differ according to type of product or retail channel?
- ✓ Why do you think consumers/SFSC intermediaries buy the products of your competition? What are the most important factors/drivers/motivations for them when shopping for the competition's products (freshness, taste, quality, price, convenience, human factor, etc)? Do these reasons differ according to type of product or retail channel?
- ✓ What are the main obstacles to buying food products for customers/SFSC intermediaries?
- ✓ Are the consumers/SFSC intermediaries willing to pay more for some of your food products? For what kind of products or product attributes?
- ✓ In your view, how aware are consumers/SFSC intermediaries of the social and environmental impact of current food production? Are they aware of the distinction between short and long food supply chains? Do you actively explain these aspects to your consumers and clients?
- ✓ What do you think the consumers' and SFSC intermediaries' wants/needs/values are when it comes to your products? Does this differ according to different consumer/SFSC intermediary characteristics?
- ✓ Do you know if consumers/SFSC intermediaries want to know about your business/products/services? About the food production process/benefits (health, environmental, support for local economy? Percentage of profit earned through direct selling as compared to long chains?
- ✓ Do customers/clients positively perceive the brand/policy of the company?
- ✓ Do customers/clients perceive the transparency of the company (win-win relationship, consumers well-informed about attributes and production, fair prices for both, etc)?

Appendix E: Method for assessing the consumers' vulnerability to SARS-CoV-2 when purchasing in SFSCs

The method developed in SMARTCHAIN is based on the combination of the Simplified Microbiological Risk Assessment, with a HACCP study. Risks of infection of consumers by SARS-CoV-2 are identified and calculated for each step of each type of SFSC (19 different ones are considered). A simple scoring system was developed. The higher the risk, the higher the score. The steps in an SFSC representing high risk (where interventions have to be applied) can be identified. The specific SFSC can be redesigned to reduce the risks. The impact on the risk of infection of consumers can be easily evaluated again and compared to the initial set-up. The risks associated to different SFSCs can be compared.

The tool comprises (1) a method for assessing consumers' risk of infection, (2) an inventory of hazards and guidelines for good practices and (3) a redesign of conventional SFSCs.



Risk assessment method

During the risk assessment, the frequency of occurrence of the coronavirus during the steps of 19 types of short supply chains was evaluated, considering the vulnerability of the protection to prevent the virus from entering the human body and the severity of the hazard. During the study, the steps of a flow chart of the processes were followed.

The following aspects should be considered during the study:

- ✓ A flowchart of the steps of the SFSC should be prepared;
- ✓ The hazard of infection of the consumers during the step with SARS-CoV-2 and potential causes is analysed in each step;
- ✓ Control measures currently in use should be described;
- ✓ The frequency of occurrence of coronavirus (F) in each step shall be identified;
- ✓ The vulnerability of the level of protection to prevent the virus from entering the human body (V) shall be identified;
- ✓ The severity of the hazard (S) shall be identified;

- ✓ Expected control measures to reduce the risk during the acute coronavirus pandemic shall be described;
- ✓ Expected control measures to be maintained after the coronavirus pandemic shall be described.

Instructions for implementation

1) **Determine the flowchart of your SFSC's operation.**
2) **Assess the risk of consumers becoming infected with the SARS-CoV-2 virus when purchasing food from your short food chain**.

   a. List the hazards and all potential causes of the contamination leading to the SARS-CoV-2 virus infection of the consumers, for each step.
   b. Determine the currently available control methods for this hazard and the causes of SARS-CoV-2 infection.
   c. Evaluate the frequency, vulnerability of the human body's protection and the severity of the hazard by using the scoring tables here.

   The frequency of occurrence of the hazard (F) shall be scored on a 6-point scale, where:

1 means negligible:	so rare that it does not merit consideration;
2 means very low:	very rare but cannot be excluded;
3 means low:	rare, but does occur;
4 means medium:	occurs regularly;
5 means high:	occurs very often;
6 means very high:	occurs almost certainly.

   The vulnerability of the protection preventing the virus (VI) from entering the human body shall be scored on a 5-point scale, where:

1 means very small:	water, food or negligible route;
2 means small:	from surface to people and from people to surface (metal, plastic, paper, glass, etc) (without protection tools);
3 means medium:	person to person, except respiratory spread;
4 means high:	from people to people through the air in an open area, via droplets (without protection tools);
5 means very high:	from people to people through the air in the closed area, through droplets (without protection tools).

   The severity of the hazard (S) shall be scored on a 4-point scale, where:

1 means negligible:	an asymptomatic condition or so mild that they are not worthy consideration;
2 means low:	weak symptoms, mild illness, rapid recovery at home;
3 means medium:	heavy symptoms, moderate illness, longer recovery requiring hospitalisation;
4 means high:	heavy symptoms, severe illness, hospital care is needed. In some case leads to death.

3) **The risk for each step can be calculated by multiplying the risk assessment scores.**
   To do so, the following calculation must be made: **F x V x S** (used for human-to-human infection and human-to-object or object-to-human infection).

The **frequency** of occurrence of the hazard (F)	x	The **vulnerability** of the protection against the ingress of the virus to the human body (V)	x	The **severity** of the hazard (S)	=	**Risk**	for human-to-human infection and human-to-object or object-to-human infection

4) **Identify those steps in your current SFSC, that are associated to a higher risk of SARS-CoV-2 infection.**

5) **Redesign your SFSC**, **identify those changes in the operation of your current SFSC which can result in the reduction of the risk score in these steps**.
The risk assessment and risk scores according to the organisation' professional judgment shall be modified as necessary.

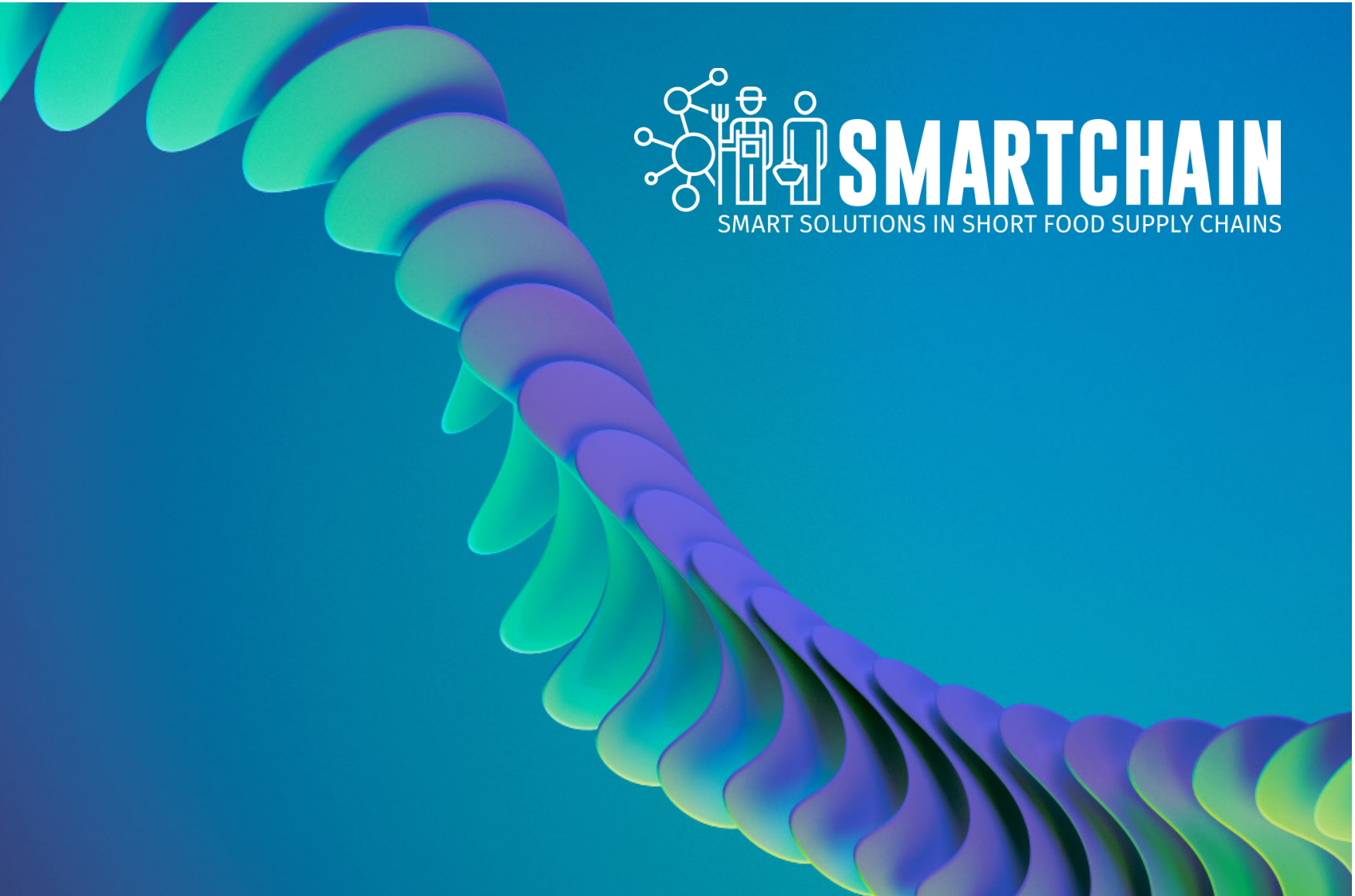
Generic SFSC models for the risk assessment

To carry out the task, 19 generic models of SFSCs were initially identified to help with the SARS-CoV-2 risk assessment: farmer's shop, mobile shop, retail shop, shop in the farmer's courtyard, box delivery community, fair market, market, events and programmes, door-to-door selling, CSA, temporary outdoor purchase, restaurants and catering, institutional catering, village guest table, food and drink vending machine, local product vending machine, pick-your-own, home delivery and web shop. These reference models have unique characteristics and generic schemes per model, considering the economic, social, cultural and organisational context. All of the 19 generic models can be classified in the 5 reference exploitation models specified in the SMARCTCHAIN project: cooperative producers, individual producers, CSA, online-offline marketplace and promotion of farm sales.

Annex II

Infographic - A graphic version of the best practice guide for the implementation of innovative solutions in SFSCs

Best practice guide for the implementation of innovative solutions in SFCs



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Background and objective of the guide

In recent centuries, the agri-food system has been strongly driven by the paradigm of globalisation. It has accordingly evolved from a production and trade system primarily based on almost disconnected local economies to an interconnected and integrated global trade system. In an increasingly specialised and complex world, intermediaries, large corporations, and above all long food supply chains play a lead role. Indeed, today most of the EU population buys food from large supermarket chains. This has led not only to a loss of the connection between consumers and primary producers (consumers cannot track the food to a recognised producer or area) but also to concerns about transparency, environmental policy, workers' rights, rural development and food ethics, among others.

In the last two decades, alternative food supply initiatives and networks have blossomed across Europe and North America. Such initiatives (i.e., farmers' markets, farm shops, community supported agriculture, online shops) meant to reconnect producers and consumers have been labelled '**short food supply chains' (SFSCs)**. Often operating in urban and peri-urban settings, SFSCs respond to an increasing desire of urban consumers to access secure, high-quality and sustainable food, and to producers' need to capture a higher percentage of the added value. SFSCs may act as a driver of change and a model to increase transparency, trust, equity, and growth throughout the agri-food chain.

"Short food supply chains (SFSCs) are co-operative systems that include very few intermediaries, increasing sustainability, transparency, social relations and fairer prices for farmers and consumers. Such supply chains usually involve local producers working together to promote local food which, in many cases, only travels a short distance, so farmers and consumers can communicate with each other."

Despite their continuous development and the support of governments and authorities (from European to local level), SFSCs have faced difficulties that prevent or limit their success and progress. Some of these challenges can be resolved by applying **innovative solutions** already on the market, which could be tailored to meet the SFSCs' scale. However, small farmers and producers associated to SFSCs often do not have the resources (money, time, personal and knowledge) to find, apply, and adapt such innovations and, finally, to resolve those problems by themselves. Closing these gaps would actively contribute to transforming the SFSC into a concrete and sustainable alternative to the globalised food system.

In this context, the EU project **SMARTCHAIN** (https://www.smartchain-h2020.eu/) was launched in 2018 involving 43 partners from 9 EU and 2 associated countries, including key stakeholders from the realm of SFSCs as actors in the project. The aim of this collaborative and multi-actor project is to foster and accelerate the shift towards collaborative SFSCs and, through specific actions and recommendations, to introduce innovative practical solutions that enhance the competitiveness and sustainability of the European agri-food system. One of these specific actions is the current document, a best **practice guide to help small farmers and producers involved in SFSCs to implement innovative solutions**.

Primarily based on SMARTCHAIN findings, this guide presents relevant information, **successful cases of the innovation implementation in SFSCs**, a **specific set of recommendations** and **a methodology to facilitate not only the identification of problems and needs but also the search for and application of innovative solutions**. To carry out this work, a team of 17 experts from 6 European institutions (AZTI, Campden BRI Hungary, the Mediterranean Agronomic Institute of Bari, Organic Services, the University of Belgrade and the University of Torino) from Germany, Hungary, Italy, Serbia and Spain were involved. Furthermore, based on the SMARTCHAIN's multi-actor approach, 9 experts from AMPED, EUFIC, KIS, ISEKI, the University of Hohenheim and the University of Crete (Austria, Belgium, Germany, Greece, Hungary, and The Netherlands) revised this guide.

1. Innovation in short food supply chain initiatives

1.1 What is innovation in the short food supply context?

Innovation in SFSCs can be defined as the **process** by which a **change** is induced in current procedures, resulting in **improved performance** that provides a **better 'value for money'** and a **sustained competitive advantage**. In this context, **process** is a very general concept that includes actions of different nature, such as to implement new technology, develop a new food product, use knowledge, use effective management, etc.

Innovation can happen at **any point in the value chain and in any part of the business**: production, processing, food packaging, food safety and food quality, logistics, marketing, etc.

Innovation can **improve the performance of SFSCs by eliminating/reducing their typical bottlenecks and enhancing exploitation of their typical success factors**.

The competitive advantage of an innovative initiative may be due to:

- **reduced costs** (economies of scale, longer shelf life, economic benefits resulting from increased product margin, lower transaction costs and fair prices, less distribution cost, etc);

- **product differentiation**, with gains acknowledged by purchasers due to its unique quality (high quality, local, non-manipulated/adulterated, sustainable, fresh and natural, animal welfare, etc);

- **service differentiation** based on the accessibility of products from SFSCs for consumers (geographic proximity, diverse selling points, home deliveries, greater product diversity, etc); on skills and knowledge (a potential place to learn about food production and about nature, place to educate children through play, etc); on social connection; and on trust (environmental sustainability, directly from growers, transparency, unique products, support for producers, consumer participation, etc).

1.2 Classification of innovations

According to SMARTCHAIN approach, the innovations in SFSCs may be classified as **technological, non-technological and social** (Figure 1).

Technological innovations are primarily driven by a technological invention or improvement and comprise new products (goods and services) and processes and significant technological changes of products (considerably improved) and processes. An innovation has been implemented if it has been introduced in the market (product innovation) (OECD).

Many innovations are of a **non-technological** nature, for example in areas such as marketing, organisation management and design. Those not primarily driven by a technological invention or improvement are hence referred to as non-technological innovations. The term is not unproblematic, since a technology (for example information and communication technology) is used as an enabler to support most of today's innovations, even when technology is not the focus or driver of the innovation (European Commission).

Social innovations are processes that change SFSC systems by changing the relationships, perspectives, and ways of thinking and acting of the actors involved, leading to the achievement of primarily social goals that benefit all (of the SFSC actors). Social innovations bring about change (new relationships, new mentalities).

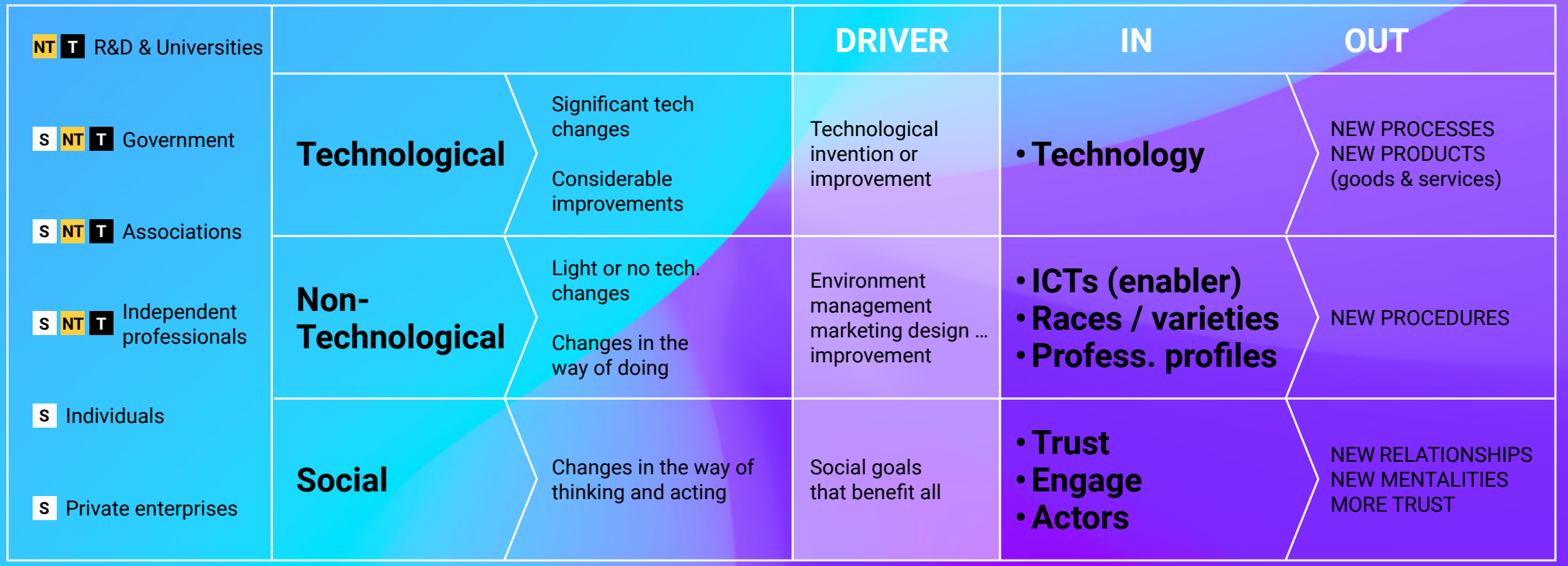

Figure 1. Diagram of the different kinds of SFSC innovations according to the SMARTCHAIN concept

1.3 General characteristics of a successful innovation

Based on SMARTCHAIN results, a list of **6 general characteristics of successful innovation in SFSCs** was established (Figure 2). These characteristics are average and all of them are not present in all the successful innovations. Examples of positive and profitable innovation can therefore be found outside of them.

The involvement of stakeholders is essential for innovation to be successfully implemented and sustainable. In average, **at least 2 stakeholders** were involved in the studied innovations of SMARTCHAIN. Stakeholder cooperation facilitates innovation in SFSCs in at least two ways: it reduces the costs of implementing innovations that promote value creation in the supply chain, and it provides relevant know-how for the implementation.

An innovation is not necessarily be associated to a high cost and an entirely new idea. I**nnovative actions can have a relatively low cost and be new just for the organisation that implement them**. Indeed, a large part of the innovations in SFSCs derive from the **inclusion of innovations successfully implemented in other fields or other geographical areas**. An example of this is the rapid development of digital technologies, widely used businesses with a more complex organisational structure and in technological applications; they provide a range of new enabling functions and solutions which can be adapted to SFSCs. According to the SMARTCHAIN results, more than 90% of innovations in SFSCs are used by others in other countries or in other regions (of the home country).

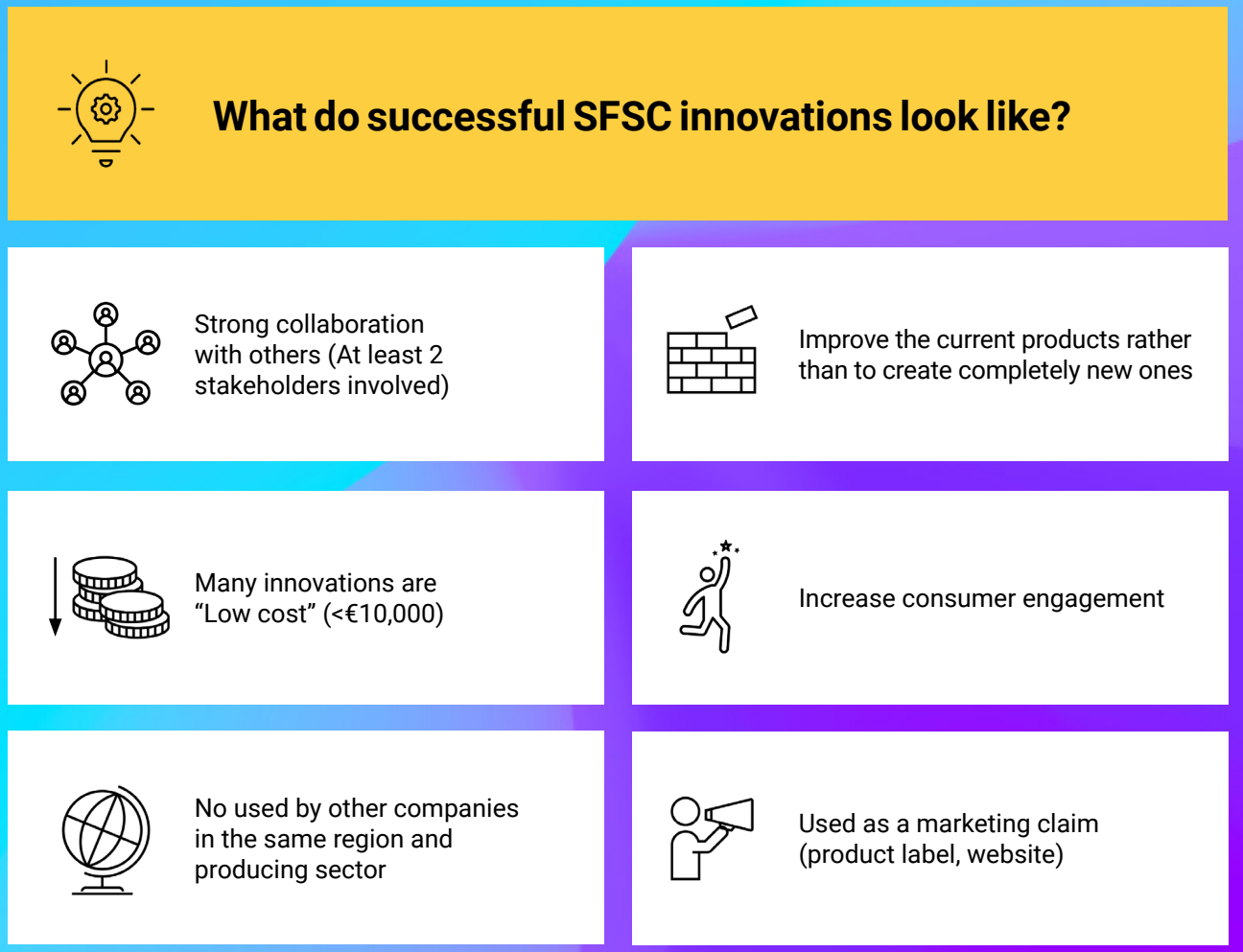

Figure 2. General characteristics of a successful innovation in SFSC.

Innovation sometimes consists of refining or improving processes or products (incremental innovation); sometimes the change is major, disruptive, and may completely reshape or redefine the way something is done (radical innovation). Incremental innovations tend to be dismissed and much greater value is put on (potentially) breakthrough innovations. However, innovations that may not be technologically significant enough to attract global attention can still be very important from an economic standpoint. Indeed, according to SAMARTCHAIN, two thirds of the innovations applied in SFSCs are incremental.

As explored in SMARTCHAIN, consumers generally have little understanding of SFSCs. In some countries, SFSCs have significant problems connecting with consumers. As in any business, the way to long-term sustainability is finding the right customers who value the product and are willing to pay. Thus, a relevant number of the innovations studied in SMARTCHAIN improve **consumer engagement**, for example, by facilitating purchases, improving the connection with them, promoting social events or involving them in the production process. Consumer-related innovations are commonly associated to successful SFSC initiatives: **in successful SFSCs, consumers are often at the heart of the business**.

Finally, innovation applied successfully is commonly used as a **marketing claim** by the organisation. This means that SFSC initiatives use the applied innovation as a marketing tool: highlighting it on the label and/or on the website, using it as a key part of the respective value proposition and employing it as a sales argument when talking with restaurants, specialty retailers or catering services.

2. General best practices for implementing innovation

Based on the analysis of the 6 most important characteristics of the successful innovations, **6 general recommendations/tips/best practices were identified for implementing innovation in SFSCs**: (1) collaboration is key; (2) 'low-cost' innovation can make the difference; (3) seek innovations that work in other regions, countries or sectors; (4) select innovations that really add value to your product or service; (5) think of consumers; and (6) take advantage of innovation for marketing (Figure 3).

Collaboration is key. Stakeholders are commonly involved in the innovative solutions successfully applied in SFSCs. SFSC initiatives are characterised by a low number of employees and low human, technical and economic resources. If an SFSC initiative aims to resolve any problem or improve performance through innovation, a clear recommendation is to contact the stakeholders that have the required knowledge/experience/resource that is not present in the organisation. The process is easier when the SFSC initiative has built up a multidisciplinary network of contacts since it was established.

Sometimes **innovations with 'low cost' can make the difference**. SFSC practitioners commonly associate innovation with a ground-breaking and 'high-cost' solution. However, innovation is not always related to such a solution: the problem can sometimes be easily resolved by applying a simple innovation with a relative low cost. Furthermore, considering the commonly low financial resources of SFSC initiatives, the application of a high-cost innovation can be very difficult. It may completely revolutionise the way of producing or selling and provide a clear competitive advantage, but the risk of failure can be very high. Thus, in the SFSC context it is usually better to move the focus to 'low-cost' innovation, resolving problems and improving products and services step by step. It is less risky and the SFSC practitioners can learn during the process: **innovation must be considered as a continuous process**.

Seek innovations that work in organisations from other regions, countries or sectors. If a problem has already been resolved there is no need to waste time developing a completely new solution. There are problems that are common to the companies from other sectors, regions or countries. Investigating how they deal with these common problems can be a good and quick way to find an innovative solution or obtain inspiration. Of course, if the applied solution is industrially protected by a patent or a similar method, it is first necessary to contact the owner to apply for a use permit or patent licence. Related to the first recommendation (collaboration is key), a good network of contacts from different regions of the country, or even from other countries, can be a catalyst to accelerate the process.

Prioritise innovations that really add value to your products and services, innovations than can differentiate your company from your competitors. Independently of production sector, a company always has different problems or points for improvement, which can be resolved by different innovative solutions. Sometimes, those problems/points of improvement may be associated to organisational or internal topics not directly linked to food quality or how sales are made. Due to the SFSCs' low resources, it is recommended that priority be given to the application of innovations which can be directly associated to improvements in food quality, sales price, value proposition and the relationship with consumers and/or which can be positively valued by customers. They can clearly differentiate the organisation from the competition.

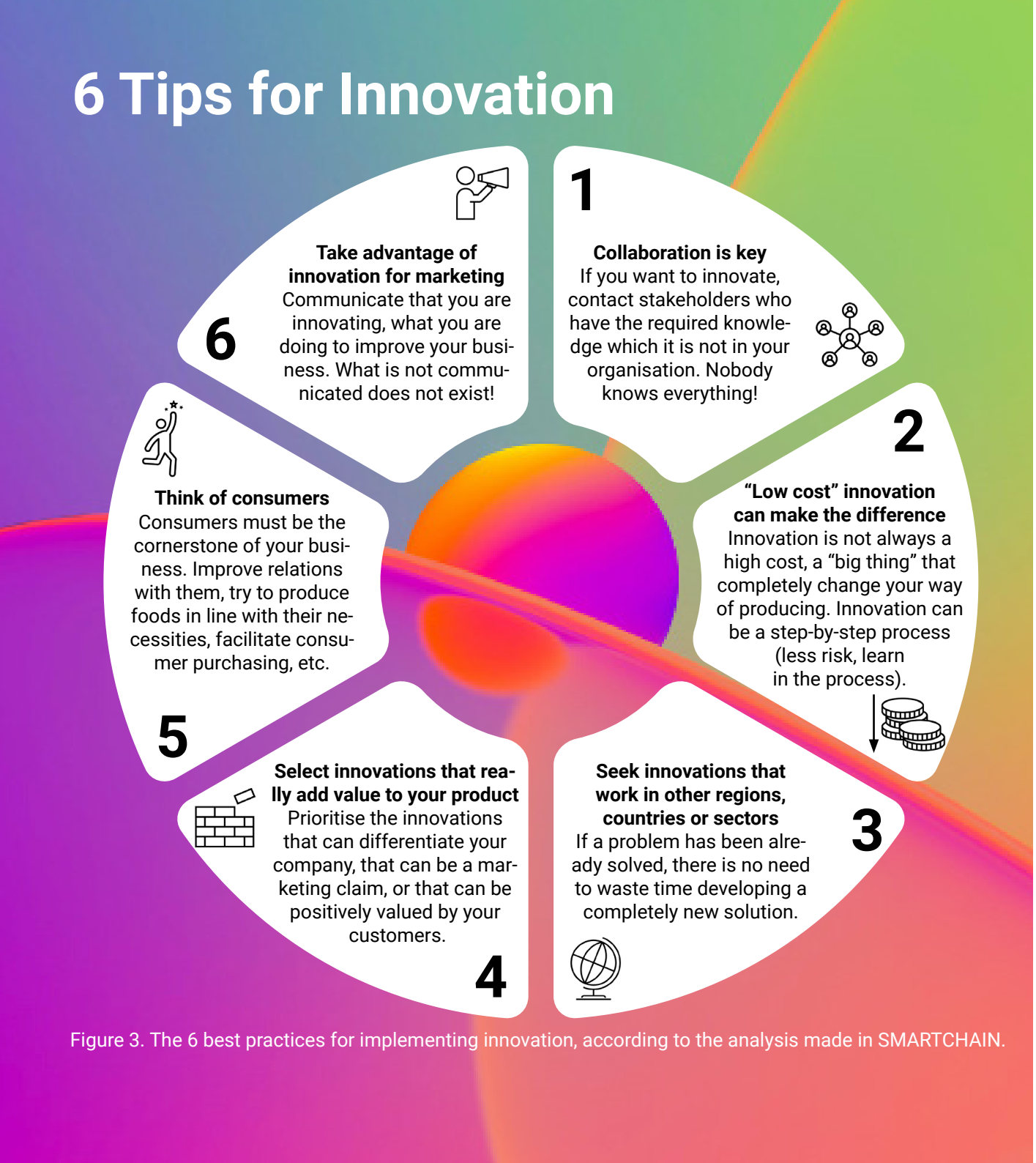

Figure 3. The 6 best practices for implementing innovation, according to the analysis made in SMARTCHAIN.

Think of the consumers. Consumers are often neglected by small food companies. SFSC farmers and producers are normally centred on what they are experts in: to produce the best possible products in the best possible way. Thus, they normally think of innovation in terms of reducing production costs or improving food quality. However, as in all types of business, the customers, the consumers, must be the cornerstone. There are numerous examples of companies that produced the best products in their respective sectors but fell into crisis or even disappeared because they neglected the consumer relationship and marketing. A successful company pays attention to the consumers of its products and listens to them. Thus, a good recommendation for SFSC initiatives is to invest in innovations that improve the relationship with their consumers, enable the production of foods that are truly aligned with their necessities and facilitate consumer purchasing. **The closer the relationship with consumers, the easier it will be for them to value your products** over those of your competitors (even if they are more expensive) and **the easier it will be for them to become regular buyers** (an essential factor).

Take advantage of innovation for marketing. It is recommended that innovation be used as a marketing claim: it should be a crucial topic in the communication strategy of the SFSC initiative. In the 21st century, consumers have more shopping options than ever before, so it is essential to engage them using all available tools. **What is not communicated does not exist.** If a company does not communicate its innovations, how will the customer be able to value them? We live in an era in which the internet and social media have revolutionised social and business communication. Communicating and connecting with consumers has never been easier. A good recommendation is to communicate through the company website and social media that an innovation has been implemented, trying to indicate how it can be useful/interesting for consumers (new sales channel, new way of connecting with them, new format, new recipe, new packaging, increase shelf life, etc) and how it differentiates the company from the competition (the only company that applies it in the region, the first company that sells its products in the region through this sales channel, etc). Furthermore, **the products' packaging and labelling can also be used for communicating and marketing**: the key innovative features should also be highlighted here.

3. Best practices guide: a step-by-step path to innovation

A methodology based on **a step-by-step path has been created to innovate in SFSCs**.

The idea of this methodology is **to guide and help the internal work that should be done by the farmer or small producer on the road to innovation**. It basically consists of 6 steps:

1) **Know your SFSC initiative;**

2) **Know your surroundings and your clients;**

3) **Identify your bottlenecks and success factors;**

4) **Seek and identify innovative solutions;**

5) **Select the innovative solution based on cost-benefit analysis;**

6) **Implement the innovative solution and go to market.**

Each step usually groups a set of questions (to be answered by the SFSC practitioner) and recommendations for taking each step (and preparing for the next ones) in the best way possible. These sets of questions and recommendations aim to cover and highlight the most important **regional/local effects**, especially those associated to economic, environmental, legal-governance and socio-cultural indicators, and **the role of the different stakeholders** of the value chain.

Innovation is always associated to a non-negligible risk of error, especially in the long term. Following the SMARTCHAIN step-by-step path will not assure that the innovation will be 100% successful in the short and long terms, though it will **increase the probability of fruitful innovation**, assuring that it is aligned with the problems, needs, markets, regional/local environment and business model of each SFSC practitioner.

Based on the experience of the SMARTCHAIN partners, t**he following general points and recommendations should be considered before starting on the path of innovation**:

- **The more information, the better.** It is recommendable to collect as much business information as possible before starting on the path, especially for steps 1 and 2. SFSC initiatives that have, among others, a sales register, clear business model and mechanism to obtain feedback from customers will find the process easier;

- **The more people involved in the process, the better.** It is recommendable that everyone involved in the SFSC initiative participate in the process, or at last one representative from each company department or field of knowledge (marketing, farming, post-harvest processing, administrative, etc). This is especially important in steps 1, 2, 3 and 4. When possible, **also invite key stakeholders** (taking precautions with respect to confidential data);

- **Several sessions are required.** Due to the complexity of the work, it is impossible to do it properly in one day. From a general perspective, probably at least one or two sessions (around 3-6 hours in total) are needed to complete steps 1 to 3. Steps 4 to 6 require

more work and, consequently, more sessions. The sessions required as well as the timeline may vary, depending on the difficulty of the problems/needs found in the step 3 and the previous experience of the SFSC initiative, among others (the existence of a solid business model, previous experience implementing innovations, marketing knowledge/skills, etc);

• **Use an innovation canvas.** To facilitate conceptualisation and follow-up of the proposed step-by step process, the use of canvas concept (Figure 4) is recommended. This is even more relevant in steps 1 to 4 or when many people are involved in the analysis. The best way is to prepare large sheets of paper for each step, hang them on a wall at the SFSC facilities and then fill them in during the different sessions, using markers, pens or post-its. Of course, a software solution (presentation program, graphic design software, etc) could be used for this purpose;

• **Use a facilitator or moderator.** This person will be responsible for preparing all things required to do the work, organizing the sessions with all the people involved, explaining the work to be done and collecting the results. It could be an SFSC initiative worker who uses this guide as an instruction booklet. In any case, the presence of an **external facilitator** with previous experience in business, marketing and innovation could speed up the work a great deal. That person could be an expert from local government, technology-research centres or farmers associations.

Figure 4. Innovation canvas proposed for the step-by-step path to innovation of SMARTCHAIN.

3.1 Step 1: Know your SFSC initiative

The first step on the road to innovation is to know what **the business model of the SFSC initiative** looks like.

In certain cases, due to their limited resources, farmers or small producers are not clear about their business model or about all the properties/ features of their products and services. This situation happens mainly with SFSC practitioners (1) who have always sold their products to the same few intermediaries and are starting with SFSCs, (2) who have sold products only via traditional short channels (farmers' markets, on-farm sales, etc) as a complement to the main business (sale to an intermediary) and (3) who do not have appropriate business or marketing skills/resources. Conversely, the largest SFSC initiatives with a good level of professionalism and enough resources to have a marketing department or a management department, could easily complete this step.

The regional effect could play an indirect role in the difficulty/ease of completing this step, since it is related to the level of business skills. The large professional SFSC initiatives located close to crowded towns and cities in industrialised regions of Europe are probably very familiar with their respective business models and do not need to put a lot of effort into this step. However, it may not be as obvious for a small farmer in a mainly rural region who sells some of the respective farm production to friends and neighbours and wants to innovate in SFSCs to improve competitiveness. The following proposed guidelines thus basically apply to this type of small SFSC producers.

First, it is suggested that the business model be prepared using the **canvas model** of Osterwalder and Pigneurr, because it is a very adaptable and easy-to-follow methodology. From a general standpoint, the business canvas model consists of filling in the information and data needed for 9 different blocks: (1) value proposition, (2) customer segments, (3) customer relationships, (4) channels, (5) key partners, (6) key activities, (7) key resources, (8) cost structure and (9) revenue streams. To obtain more information about the canvas business model in the SFSC context, the SMARTCHAIN "**Best practice guide for improved business performance in SFSCs**" can be consulted.

To collect the key data and information needed, and facilitate the internal reflection process that the SFSC initiative must undertake, **a list of more than 100 questions** has been grouped in 8 sets (see Appendix A):

1) **Description of the products and services (value proposition);**

2) **Customers segments;**

3) **Sales channels;**

4) **Customer relationship and communication;**

5) **Description of the key partners;**

6) **Description of the key resources and activities;**

7) **Finance and revenue streams;**

8) **Cost structure.**

These questions consider, among others, regional/local, economic, environmental, legal-governance and socio-cultural factors associated to the business and the stakeholders of the SFSC initiative. This list was designed as a starting point. Thus, depending on the specificities of the SFSC initiative, the list may be complemented with more questions and/or the questions may be modified.

To answer some of the questions, it is vital **to know exactly how much and when each product/service is provided and sold during the year**. For that purpose, a production and sales register (account ledger) must be kept.

Furthermore, if there is no **specific data about the composition of the SFSC products**, it is advisable to contract a service of a private laboratory, university or technological centre that can compile it. Depending on product type, value proposition and market competition, it is crucial to quantify the possible pros and cons of the products with respect to the competition.

3.2 Step 2: Know your surroundings and your clients

The second step in this innovation process comprises **the scouting and knowledge of the business surroundings, including the market, competitors, and customers** (consumers, restaurants, caterings services, specialty retailers, etc) of the offered products or services.

This research about the company's surroundings is essential to understand **market opportunity**, determine the **customers' perception of the business**, identify **the company's strengths and weaknesses** and determine the **respective needs and problems**.

For example, an SFSC initiative may have more than 30 years of experience and a solid business model based on a good product with a PDO (certified quality), yet the competition may be implementing a better marketing strategy and producing cheaper, with similar quality. The current market niche for the SFSC initiative may be so small that the stability of the company is at risk in the medium/long term. The same thing could happen if the consumer perceives the SFSC initiative negatively because, for example, it cares less about the environment than the competition or pays its workers less, even though the price of its products is higher. In addition, **the characteristics of the market, competitors and customers may limit the possible innovations to be implemented or reduce their likelihood of success**. For example, an SFSC initiative may want to open an online shop due to the global increase in online sales during the SARS-CoV-2 pandemic; but its

top competitor may currently have one that is excellent and already has a loyal following.

A good starting point for this analysis could be to answer questions like the ones presented in Appendix B (some resemble the ones answered in step 1, customer segments). To answer many of these questions and obtain the highest possible quantity and quality of responses, at the very least **market and consumer research is required, and to have a method for obtaining consumer feedback**. If the SFSC initiative does not have the knowledge and skills for that purpose, they can be subcontracted or supported by private marketing companies, technological centres or universities. Of course, undertaking or subcontracting them may be difficult for small SFSC initiatives with low personal and financial resources. In any case, some **general recommendations** can be provided to try to obtain the necessary data and information:

- **Contact and join sectorial associations at national and/or regional level.** They normally conduct their own market/consumer research and consumer surveys and/or prepare annual reports on the market for a specific product (dairy foods, juices, organic food, etc). They may thus be a good source of data to learn the general characteristics of the market;

- **Check public statistics and reports about food consumption and prices.** Eurostat publishes data and reports at European and EU country level[1] . Furthermore, national and regional governments usually conduct annual consumption surveys which provide useful data. For example, the Spanish government annually publishes comprehensive data about the consumption of different foods on its website[2];

- **Consult the reports of the European Consumer Association[3]**. The website of this association contains specific reports about different topics and trends in the Food Sector;

- **Use Answer the Public or Google Trends[4]**. These websites provide information about what people are querying in Google. A limited number of consultations can be made each day.

- **Use Google Analytics[5]**. This tool can be used to **analyse data traffic of your website**, enabling users to be better informed about their customers. Google Analytics provides you with information to get to know your users and to learn how they interact with your website, with your content, sections or products. There are also other similar tools, both free and paid;

- **Establish a method for receiving customer feedback (suggestions, needs and complaints)**. Although the cost of this is relatively low, the information obtained may be very important. Select one or several ways (contact email, WhatsApp group, online questionnaire in your website, telephone, etc). This can be highlighted in your website and in the label of your products. Of course, a record should be kept of all of them so they can be analysed individually and as a whole. Different free or paid tools, like SurveyMonkey[6] can be used to help make online questionnaires;

- **Facilitate and encourage consumer feedback on your products**. You may be able to award discount vouchers to people who provide you with feedback about your website or respond to a short questionnaire.

1 EUROSTAT (https://ec.europa.eu/eurostat/web/main/home)

2 Statistics about food consumption in Spain, published by the Ministry of Agriculture, Fisheries and Food of the Spanish Government (https://www.mapa.gob.es/es/estadistica/temas/estadisticas-alimentacion/consumo-alimentario/)

3 European Consumer association (https://www.beuc.eu/publication/position-papers)

4 Answer the Public (https://answerthepublic.com/) Google Trends (https://trends.google.com/trends)

5 Google Analytics (https://analytics.google.com)

6 Survey Monkey (https://surveymonkey.com)

3.3 Step 3: Identify your bottlenecks and success factors

In this step, an internal exercise must be done by the SFSC initiative to **find all the bottlenecks (problems, needs) and the success factors (competitive advantages) which can be resolved or exploited by innovation**. After that, **they must be prioritised** to decide which one/s will be addressed in the next step. To do this work, it is suggested that the following consecutive phases be conducted:

1) **Evaluate the competitive position of the SFSC initiative**, based on step 1 and 2 results;

2) Based on that evaluation, **identify the bottlenecks and success factors**;

3) **Prioritise and select the most important bottlenecks and success factors to be addressed.**

EVALUATE THE COMPETITIVE POSITION OF THE SFSC INITIATIVE

In steps 1 and 2, different questions are provided for knowing and understanding the business model, the market, the customer segments and the competitors of the SFSC initiative. To evaluate the competitive position of the SFSC initiative, it is necessary to **analyse all the collected responses and unanswered questions** (a lack of information or omission can lead to conclusions that are sometimes more important than the information collected). This analysis can be conducted for the identification of 4 kinds of competitive factors: strengths, weaknesses, opportunities and threats. This analysis is commonly named **SWOT** (Figure 5) and is widely used in the business context.

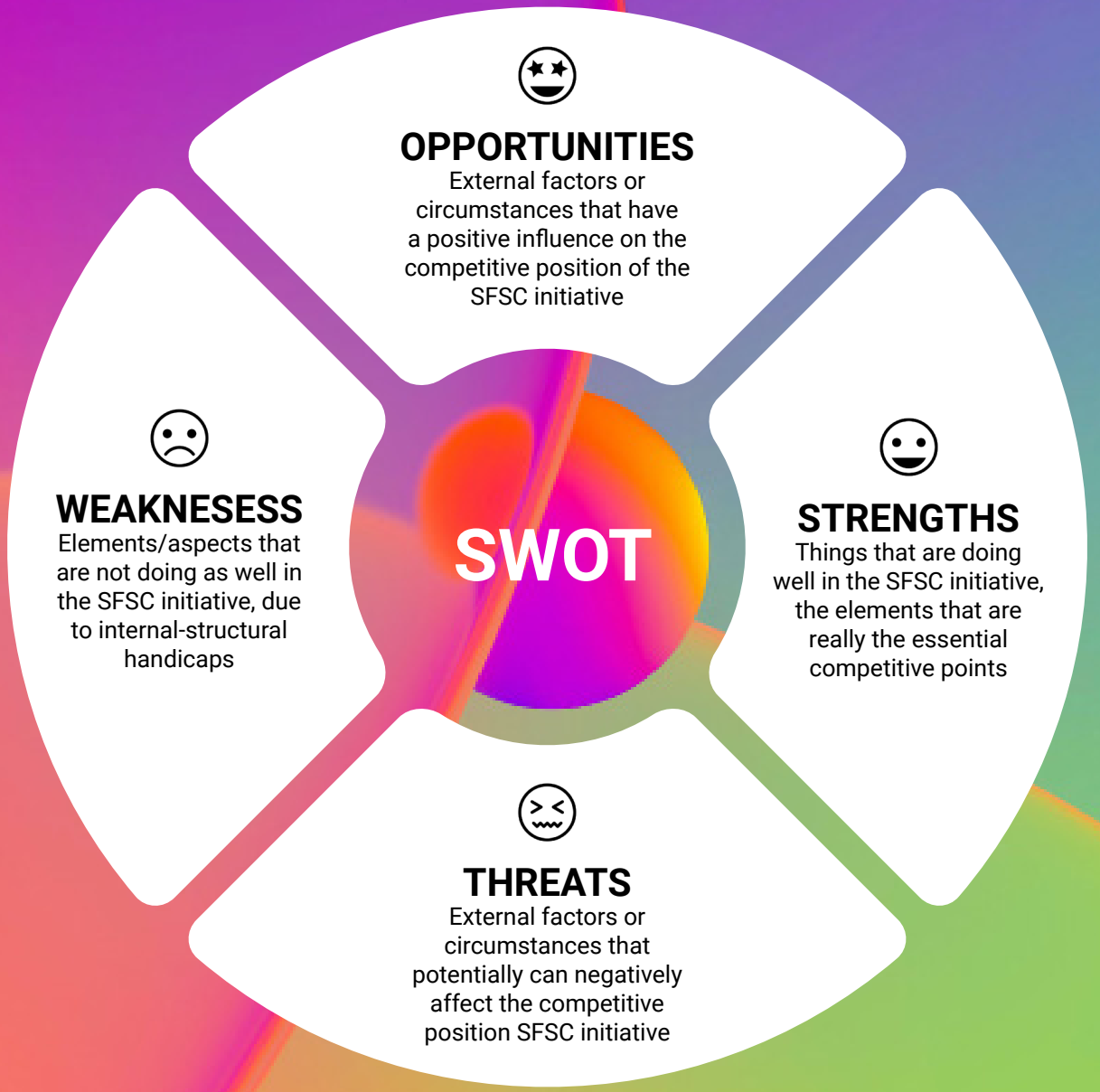

Figure 5. General scheme of the SOWT analysis (strengths, weaknesses, opportunities, and threats) to be done for analysing the competitive position of a SFSC initiative.

Strengths are the internal things that are carried out well in the SFSC initiative, the elements that are really the essential competitive points (a strong marketing plan, large benefits, a fully equipped production plant, the use of a certified quality label, the best-known producer of the specific food in the region, highly loyal customers, a very well-known brand, entire production sold without difficulty, etc).

Weaknesses are the elements/areas that are not carried out well in the SFSC initiative, due to internal/structural handicaps (lack of knowledge, no resources, small production, production seasonality, short product shelf life, etc). These elements/areas need to be improved or resolved to optimise the business and improve the competitive position (debts, no marketing, cannot sell all production, high production costs, lack of consumer engagement, no market data, microbiological problems, etc).

Opportunities are external factors or circumstances that have a positive influence on the competitive position of the SFSC initiative (a consumption trend, increase in local shopping due to the SARS-CoV-2 pandemic, increased population, lower taxes, government subsidies for the sector, competitor closure, etc). They can be current or in the short-, medium- or long-term future.

Threats are external factors or circumstances that can potentially negatively affect the competitive position SFSC initiative (temperature increase due to climate change, an economic crisis, new legal restrictions in a couple of years associated to the use of fertilisers, the presence of a new competitor in the region, higher energy prices, crops pest, depopulation, etc). Like opportunities, they can influence the SFSC at present or in the short-, medium- or long-term future.

To carry out the SWOT exercise, the best is to **progress systematically**, identifying the specific strengths, weaknesses, opportunities and threats of the SFSC initiative for **each of the set/blocks of questions in steps 1 and 2**: (1) description of the products and services (value proposition); (2) customer segments; (3) supply channels; (4) customer relationship and communication; (5) description of the key partners; (6) description of key resources and activities; (7) finance and revenue streams; (8) cost structure; and (9) business surroundings – market, competitors, and customers.

After the identification process, it is useful to **list the strengths, weaknesses, opportunities and threats in order of importance**. If different people are involved in the exercise, a voting round can be organised to agree on the order of the strengths, weaknesses, opportunities and threats.

IDENTIFY BOTTLENECKS AND SUCCESS FACTORS

According to the work done in the SMARTCHAIN project, the strengths, weaknesses, opportunities and threats must be studied carefully to detect the **company's bottlenecks and success factors**.

Bottlenecks (problems, needs) **are outcomes of weaknesses** that can hamper exploitation of an opportunity to improve the SFSC performance (**Weakness-Opportunity**) or increase the impact of a threat, reducing the SFSC performance (**Weakness-Threat**). Most of them can be eliminated or reduced by innovation.

Success factors (competitive advantages) **are outcomes of strengths that can be improved or further exploited by an innovation** to (1) support exploitation of an opportunity to improve performance of the SFSC (**Strength-Opportunity**); or (2) eliminate or reduce a threat that can decrease/spoil the company's performance (**Strength-Threat**).

Some bottlenecks may be interconnected, having one primary problem and several secondary problems arising from it. It may sometimes be difficult to discover the original problem (the main cause) and what is a consequence. The recommendation is to deal with this in the next phase, identifying in this phase every problem/need (interconnected or not) as a bottleneck. The same applies to success factors.

PRIORITISE AND SELECT THE BOTTLENECKS AND SUCCESS FACTORS TO BE ADDRESSED

The last phase of this step is to rank bottlenecks (problems/needs) and success factors (competitive advantages) to select those whose resolution, mitigation or consideration could improve the SFSC.

First, it is useful to a**nalysis the influence of each bottleneck and success factor in the different key aspects of the business model and surroundings that are associated to the SFSC's competitive position** (which correspond with each of the set/blocks of questions in steps 1 and 2): (1) value proposition of products and services; (2) customer segments; (3) supply channels; (4) customer relationship and communication; (5) key partners; (6) key resources and activities; (7) finance and revenue streams; (8) cost structure; and (9) business surroundings – market, competitors and customers. To that end, it is necessary to respond questions like the following:

- Is it linked to the **value proposition of your products and services**? If yes, how does it in-

fluence them? Does it concern all your products and services or only one/some of them?

• Does it concern your **customer segments**? If yes, how does it influence them?

• Is it linked to your **supply channels**? If yes, how does it influence them?

• Does it concern how you **relate and communicate with your customers**? If so, how does it influence this?

• Is it associated to your k**ey partners, stakeholders and network**? If yes, how does it influence them?

• Does it concern how you produce and your **key activities**? If yes, how does it influence them? Is it associated to all your key activities or only one/some of them?

• Is it linked to your **key resources** (economic, infrastructure, personal, knowledge)? If yes, how does it influence them?

• Is it correlated to the **cost** of your products/services? If yes, how does it influence it? Can this be quantified?

• Is it connected to your **revenue streams and profit margins**? If yes, how does it influence them? Is it possible to quantify this?

• Does it **only affect you or the whole sector** at local/regional/national/European level? How? Has it already been resolved by your competitors?

• What is the time dimension? Does it **affect**

you already or will it do so in the short- or medium-long-term?

• Is it **obligatory to address it because of an external reason** (a new legal requirement, etc)?

After responding these questions, it is useful to try to **evaluate the impact of the bottleneck or the success factor for each of the analysed aspects** (value proposition, customers segments, supply channels, communication with your customers/consumers, etc). For example, a scale from 0 to 4 can be used, where 0 indicates no influence, 1 low influence, 2 medium influence and 3 high influence; 4 indicates those that it must absolutely be resolved (a new legal requirement, microbiological problem, etc).

Different bottlenecks and success factors are usually associated to various aspects with different levels of importance. For example, if there is a lack of consumer engagement, it affects not only customers/consumers, but probably also the sales channels (which may not be the good ones) or the relationship with consumers (probably a lack of communication). In general, **the more important the bottleneck or success factor, the higher the score it will receive and the more aspects it will affect.**

3.4 Step 4: Seek and identify innovative solutions

After in-depth analysis of the business model and value proposition (product or service), finishing the market discovery (customers and competitors) and identifying the main bottlenecks and success factors, the next step is to **seek and identify potential innovative solutions that can resolve or mitigate those bottlenecks (problems, needs) and improve or further exploit those success factors (competitive advantages)**.

Based on the SMARTCHAIN results, especially those corresponding to technological, non-technological and social innovations and the general recommendations for implementing innovation, **two general recommendations** for seeking information about potential innovations result: **talk with people in your network and use the SMARTCHAIN innovation platform**.

TALK WITH THE PEOPLE OF YOUR NETWORK

The **contact network** can play a crucial role in identifying innovative solutions:

- **Talk with other farmers and producers**.

  – Regardless of whether they produce the same products as you or belong to the same association, talking with other farmers and producers and sharing information can be beneficial (1) for finding common problems and needs; (2) for identifying innovative solutions and; potentially, (3) for sharing equipment and/or solutions for common problems/needs;

  – A farmer of the network may have had the same problem as you, applying an innovative solution that can also help resolve your problem;

  – Contact with other farmers and small producers from other regions and countries may also be a great help when seeking innovations applied in your sector;

- **Talk with local and regional governments**.

  – Regional and local governments, especially departments associated to rural development and food production, can be a good source of advice to identify innovations. In some cases, they work in close contact with farmers, so they have the experience of several similar cases and are familiar with cross-cutting problems and needs;

  – If regional and local governments do not have a specific advisory service, they can sometimes provide the contact information of public and private entities involved in food innovation in your region;

- **Talk with food-related technological and research organisations.**

  – Public or private entities, such as university faculties/departments, research institutes and technological centres are at the top of the innovation pyramid, so they can support you in the process;
  – Most such entities have a website with a great deal of information about their research topics, projects and publications (scientific and non-scientific). Valuable information can be found simply by reviewing it;

  – It is usually easy to contact researchers and technicians. The respective contact information is supplied in the website, including name, telephone and email. Do not hesitate to contact them. If they cannot help you, they can probably at least pass on a contact who can;

- **Talk with your suppliers and providers of technologies.**

  – You are surely in contact with the necessary suppliers and providers of raw materials (including ingredients), packaging materials, logistic services, fertilisers, agricultural machinery, food processing machines and packaging machinery, etc. If some bottlenecks or success factors are associated to some of those aspects, do not hesitate to contact them;

  – They also supply other farmers or producers, so they have a cross-functional vision and perspective of the sector and respective problems;

  – They are also continually innovating to offer better products and resolve the problems of their clients; they may be able to recommend a new product, ingredient, material or machinery to resolve your need;

  – Sometimes they also work with companies from other sectors (food-related or not), so they may also be able to provide a solution or recommendation resulting from their experience;

- **Talk with other people in your network who are not involved in your business.**

– Tell your story to your friends. Sharing information and problems usually provides new perspectives on the problems and different solutions. You never know where inspiration may come from.

USE THE SMARTCHAIN INNOVATION PLATFORM

In the SMARTCHAIN project an **online innovation** platform was created, including different tools and resources on innovation in SFSC[7]. Two actions are especially recommended for identifying innovations:

• Consult the inventory of SFSC innovations.

– More than 140 technological, non-technological and social innovations have been compiled. They are briefly described, including contacts and providers, etc;

– The innovations cover a broad spectrum of topics, so a potential innovation can probably be found for each of the bottlenecks and success factors detected (agriculture and primary production, food safety and hygiene aspects and regulatory issues, food quality, food preservation and other processing technologies, logistics, food integrity, traceability, transparency, labelling and marketing concepts and communication tools, etc);

• Check all the supporting information and tools of the platform.

– Review the inventory of SFSC initiatives. A specific inventory of SFSC initiatives, including producers, associations, etc, has been created on the platform. You can consult it to obtain ideas and information regarding innovative approaches in the SFSC context in your country or of other European countries;

– Consult the publications and weblink lists. A specific set of public documents and weblinks with interesting information about SFSCs can be found in the platform. They can help you in the innovation process, expanding the network of contacts and other sources of potential innovations;

– The training section of the innovation platform contains outcomes from the Innovation and Solution-based Multi-actor Workshops held in 9 European countries (France, Germany, Greece, Hungary, Italy, the Netherlands, Serbia, Spain and Switzerland). All presentations used by the different hub managers during the workshops, containing the main results of the project, are available in 9 different languages. Additionally, the training section includes the 5-week e-learning course on Best Practices in SFSC Innovations.

7 SMARTCHAIN innovation platform (https://www.smartchain-platform.eu)

3.5 Step 5: Selection of the innovative solution based on cost-benefit analysis

In this step, **all the identified innovative solutions for addressing prioritised bottlenecks and/or success factors must be analysed to select the innovation to be implemented**.

It is recommended that each innovation be analysed in a specific **cost-benefit study from a multi-angle perspective**. The classic cost–benefit analysis weighs differences in **revenues, direct cost and transaction costs** for companies between use of the old versus the new way of working to achieve an outlet for specific quality products. This approach is centred on translating everything into **monetary impacts** (cost reduction, cost increase, lower/higher water/electricity needs, less/more labour cost, more benefits, cost of new machinery, etc). However, the **non-monetary impacts** (social impact, marketing impact, health benefits, improved wellness of workers, legal requirements, new skill requirements, etc) are of special relevance in the SFSC context and must also be considered.

COST ANALYSIS

A detailed cost study includes not only the cost incurred by incorporation of an innovation but also the costs resulting from the innovation, regarding human resources, changes in the company and possible infrastructure-related investment, etc.

Based on all the above, questions like the following should be asked and answered:

- What is the direct cost of the innovation? Taxes?

- If a loan is needed to implement the innovation, what are the conditions?

- What is the indirect cost? Is any kind of supplementary investment required?

  — Materials – compressors, laptops, scanners (metal, x-ray, etc), sensors, personal protection equipment, software, etc;

  — Intellectual property – licences (software, patents, processes, etc);

  — Facility modifications – changes in walls/rooms, connectivity, energy power increment, compressed air, water, vapour supplies, office, production plant and warehouse furniture, human safety, etc;

  — Human resources: specific profile of people (operator with knowledge in a new technology, marketing expert, etc). Is any training course needed?

  — Cleaning costs.

  — If the SFSC initiative does not have the necessary skills/knowledge, is it necessary to subcontract a technology centre or similar organisation to implement the innovation? What is the estimated cost?

- Does the innovation have any maintenance costs? What is the cost of spare parts? Is there a maintenance service nearby? Is it good?

- Does this innovation change something associated to your transaction costs (time, negotiation power, transport, etc)?

- Does this innovation increase the environmental impact of your business (generation of wastewater, production of waste, etc)? What is the cost of managing this? There is a tax related to that?

- Does this innovation produce something to be tested/certified by third parties (security certification by a third party, validation of the new plant/equipment/process by a third party due to legal requirements, analysis of the food by a third party to be sure that it complies with legal requirements, etc)?

- Does this innovation imply more bureaucracy/paperwork?

- Is the innovation approved by the authorities or institutions that regulate the sector (regarding a new ingredient, new packaging material, new processing technology, etc)? If not, what is the cost (financial and time) of the respective authorisation?

- Do European/national/regional/local regulations and legislations affect the innovation's implementation cost (cost of the permits/certifications from authorities, cost of paperwork, etc)?

- Do European/national/regional/local regulations and legislation affect the time needed for full implementation of the innovation (time required to obtain the necessary permits/certifications, etc)?

- Is there a need for legal counsel? What is the estimated cost?

• Is it possible to share the direct and indirect cost with other farmers/producers?

• Can this innovation be funded by a crowd-funding process (rewards or equity)?

• Is there any grant or financial support from European/national/regional/local government level associated to incorporation of this type of innovation? What kind of support (loan, subsidies)? When is it paid? What are the requisites for obtaining this support?

• Based on the innovation's complexity, how long do you estimate it will take to implement it? Is this time affordable or not?

• Is there a chance that the innovation will resolve the problem but give rise to a new one? Is the risk high or low?

BENEFITS ANALYSIS

When analysing benefits that may be obtained using an innovation, some questions should likewise be asked and answered, such as:

• Does the innovation have a low/affordable price for the SFSC initiative?

• Does the innovation entail any direct or indirect discounts (permanent discount for further purchases, carriage paid, etc)?

• Does this innovation solve or mitigate any other problems of the SFSC initiative? Could it be the first step in another innovation?

• Is there a reduction in the cost of the production process (less energy, less production time, less labour, fewer ingredients, less cleaning, less water, etc)?

• Does this innovation facilitate logistics or reduce cost (longer shelf-life, no refrigeration, less heavy or more resistant packaging, etc)?

• Is this innovation associated to increased sales (new supply channel, clear consumer need, sale in a new town, new market niche, etc)?

• Does the innovation allow a higher product price (higher quality, new premium recipe, etc)? Will customers appreciate the innovation? Will they be convinced to pay more for products?

• Does the innovation apply to only one of your products/services or to all of them?

• Can this innovation reduce taxes (lower taxes due to investment in innovation, lower environmental taxes, lower taxes associated to the creation of new jobs, etc)?

• Does the innovation reduce the company's environmental impact (less water, less energy, less waste, less chemicals, less plastics, etc)?

• Does this innovation bring customers and consumers closer (improved relations with consumers, more potential customers, increased transparency, etc)?

• Does this innovation facilitate the work and life of your customers and consumers (easier purchase process, new sales channel claimed by your clients, lower price, reduced time between purchase and delivery, new payment method, new return policy of the company, easier use of the product at home, improved knowledge or skills, etc)?

• Does this innovation improve the consumer's health (less sugar, less fat, etc)?

• Does this innovation improve the work, health and/or life of your employees (reduced working hours with same salary, reduced hazards, improved knowledge and skills, etc)?

• Does this innovation provide you with 'extra

time' (more time for marketing, more time for friends and family, etc)?

• Can this innovation be shared with other SFSC farmers and producers in your network?

• Will this innovation improve integration of your SFSC initiative in local society? Does it increase your social recognition?

• Does this innovation result in competitive advantages over your competitors (product differentiation, differentiation in the market, building team, new connections with relevant stakeholders, higher quality, unique marketing claim in the region, lower price, etc)?

• Is this innovation difficult for your competitors to replicate?

• Can it be used as a marketing claim in the product label (transparency, social claim, environmental, animal welfare, etc)?

• Does this innovation provide an advantage, considering the market growth trends (vegan products, new protein sources, less plastics, natural foods, etc)?

• Does this innovation help meet any current legal/mandatory requirement? Is this innovation necessary to meet a legal requirement that will take force in the next few years?

• Does this innovation provide benefits in terms of management (easier sales process, easier accounting, better market knowledge, increased management knowledge, etc)?

• Does this innovation imply less bureaucracy/ paperwork?

• Does this innovation facilitate external or internal bureaucracy/paperwork?

SELECTION OF THE INNOVATIVE SOLUTION

In brief, having answered the previous questions (and other related ones), an SFSC farmer or producer will have a better understanding of the major impact, in terms of cost and benefits, of implementing an innovation.

For each of innovations that can potentially resolve a bottleneck or exploit a success factor, it is advisable to draw up **two lists, one of benefits and one of costs, trying to rank both costs and benefits in order of importance**. All the information should then be carefully studied to **select the optimal innovation** among those detected.

The **selection process is complex**, as there are **too many factors at play** (economic, social, environmental, etc) whose prioritisation and weighting in decision-making depends on the **characteristics of the SFSC initiative**, especially its size, value proposition and principles (mission and vision). For example, the price of an innovation could be cheap for one SFSC and totally unaffordable for another. Furthermore, depending on the SFSC value proposition and principles, an innovation that can resolve a problem while also reducing environmental impact or improving employees' health may be a key point to rate (even if price increases) or may not be relevant. Based on the SMARTCHAIN results regarding successful factors for innovation in SFSCs, the general tips for implementing innovation and the partners' experience, some **recommendations for selecting the best innovative option arise**:

1) Where possible, **quantify costs and benefits** (better to use figures than words like high or low);

2) The more complete and more realistic the information, especially with respect to quantification of costs and benefits, **the more likely it is that the right innovation will be chosen** and the **lower the risk of failure** due to an overlooked or miscalculated key factor;

3) The more people who can participate, the better. A multi-actor point of view is fully advisable (farmers, processing plant workers, commercial staff, administrative staff, carriers, etc). For example, a vote can be held using a scale from 0 to 4, where 0 indicate that it is too costly for benefits and 4 that it has too many benefits and low costs;

4) If you are in doubt about which innovation to select, **remember to ask your contacts, especially research and technology associations** and organisations, for help. If possible, try to convince some of them to participate in the selection process;.

5) Innovation is not necessarily associated to high cost. If you have two possible options, the expensive is not necessarily the best;

6) Prioritise the innovation that really adds value to your products and services, the innovations than can differentiate your company from your competition;

7) If several possible innovations are similarly ranked, **prioritise the innovation that can improve the relationship with consumers – consumer engagement**.

3.6 Step 6: Implement the innovative solution and go to market

Once the cost-benefit analysis is done and the benefits outweigh the costs, it is time to **implement the technological, non-technological or social innovation** in the SFSC initiative. Thus, depending on the kind of innovation and its scope, it is also time to launch the new or improved products or services on the market.

To **maximise the chances for successful implementation and marketing, monetary savings and avoiding resource waste, an implementation and go-to-market plan with realistic stages, timings and go/no go points** is required (Figure 6). This plan should include the logical minimum progress phases that would enable evaluation of an innovation's impact:

1) **Plan design.** To identify the metrics to measure achievement of expectations in the different stages and phases;

2) **Validation**. To verify that the innovation complies with the requirements, that its application is technically and economically feasible and that the results meet expectations (pilot scale);

3) **Demonstration**. To show that the innovation resolves the problem in a close-to-real operating environment (industrial scale), including first market check;

4) **Go to market**. To define the market launch of the new process or service.

During these different stages, **the feasibility of the innovation in scenarios increasingly closer to reality must be done**, what is known as **scaling-up**. To make that, it is necessary to define different prototype levels of increasing complexity (proof of concept, small prototype, pilot prototype, minimum viable product, market sample).

The prototyping is an easily understandable step in **technological innovation**, usually involving a technology with a direct impact on the SFSC products or services. In this case, the various scaling-up stages can differ regarding the size, form or scale of the processing equipment (laboratory, pilot, industrial scale), level of subcomponent integration, resemblance to final product, production flow (kg/h) or quantity of goods produced, etc. But the prototype concept is also broad, encompassing **non-technological and social innovations**. Their scaling-up stage can be determined by factors such the level of engagement and involvement of the upstream, sidestream and downstream external actors (providers, other departments of the organisation, partnerships, consumers, etc), the number of people involved and the different website sections uploaded to the web, etc. An example of non-technological innovation could be a new company logo. In the case of first level of prototyping, an example could be a homemade drawing of the new logo, receiving feedback from a few trusted customers in personal conversations. The prototype level can gradually advance, involving more customers, including feedback from the previous comparison, subcontracting a graphic design company, printing some copies and using the new logo in some products, etc. An example of social innovation could be the organisation of social events for consumers. Regarding the latter, an initial prototype could be the organisation of one event with selected consumers, then scaling up the number of events or attendees.

Before beginning a more in-depth explanation of the different proposed implementation and go-to-market plan stages, some **general recommendations and considerations** can be highlighted:

• Implementation should be based not just on **technological aspects**, but also consider the **market, organisation, and partnership aspects**;

• To establish mechanisms to ensure that the innovation will be (1) **accepted by the customers,** (2) **accepted or properly integrated by workers** and other personnel in the organisation (in the event of structural changes) and (3) **sustainable for the company in long term**;

• Regarding acceptability by customers and workers, a good strategy is **to develop the easiest version of the resulting innovation and make comparisons with them before spending too much time on the matter.** This is especially important when the innovation's cost is high (new processing equipment, new harvesting machinery, etc). It is advisable to find **'early and key adopters'** (key customers, key partners along the chain, staff, etc) as soon quick as possible to receive get valuable feedback and iterate to create better versions;

• **A robust and sound implementation and go-to-market plan is still important, even if the innovation is not directly reflected in a new or improved products or services** to be marketed and does not impact the value proposition (new internal reorganisation, new management software, etc);

• **Previously identify all expected features and improvements of the innovative solution in order to validate them**. Throughout implementation, check to make sure the envisaged pro-

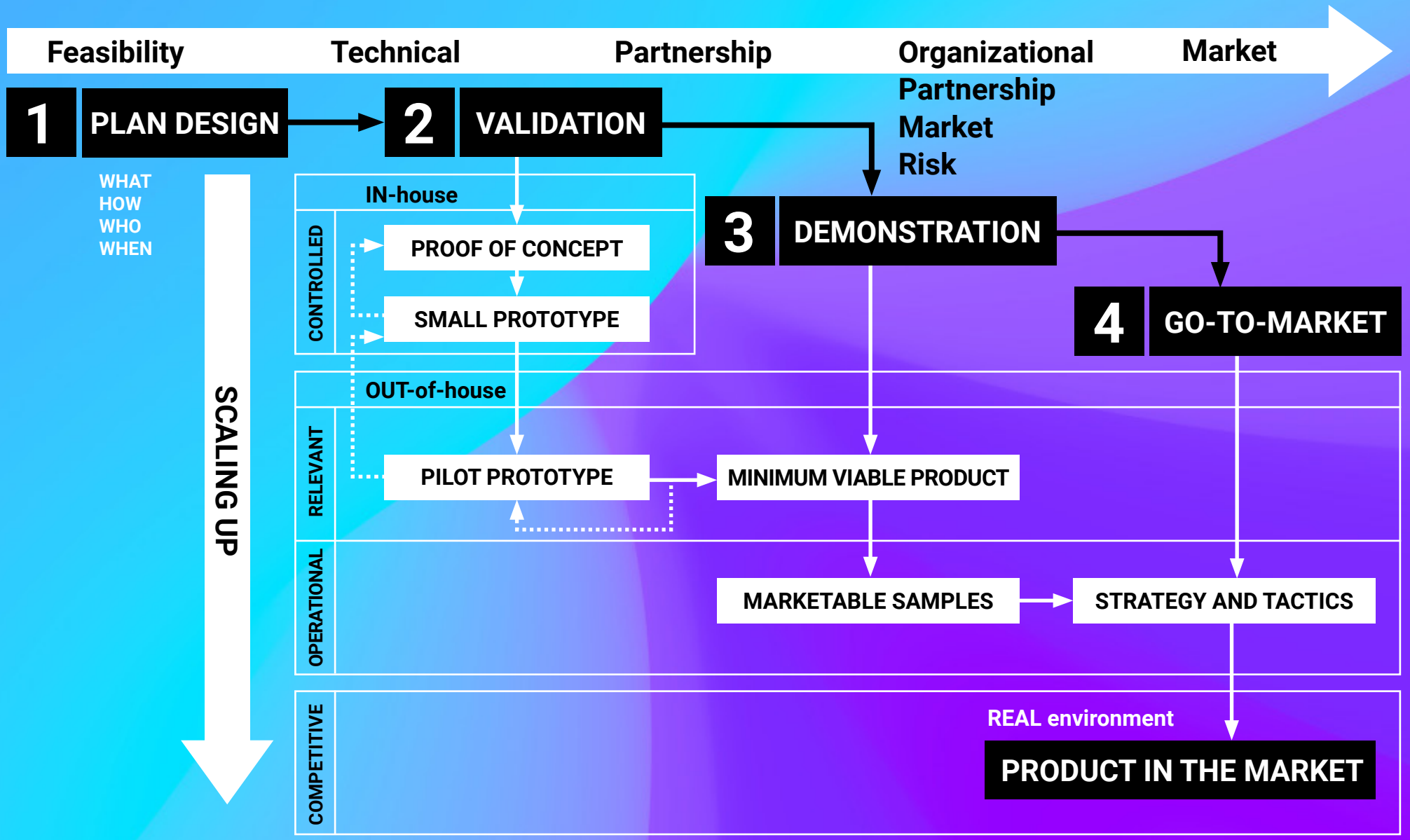

Figure 6. General diagram of the implementation and go-to-market plan proposed for innovation in SFSC.

perties and improvements actually occur when applying the changes the innovation is based on. It should also be possible to demonstrate these strengths at this phase (marketing);

• The implementation plan must enable sufficient information to be obtained, not only to verify that the expected improvements have been attained but also to **check/predict at each stage the innovation's sustainability for the organisation** and prepare to **successfully cross the market entry chasm**;

• **Establish go/no-go criteria throughout the plan**. From the concept and first prototype through to market launch, clear criteria must be determined to decide whether or not to continue the process. Hence, if the results are not as expected in a given stage, the process must provisionally pause to analyse all aspects and determine whether there is a problem with the plan's design (failed test design, early adopters not properly selected, etc) or with the innovation itself (the advantages demonstrated on a small scale are lost when scaling up, higher than projected cost of implementation, the innovation resolves the problem but creates a non-expected new one, etc). If the problem is directly associated to the innovation the process must be stopped and it would become necessary to go back to step 5 of the guide and select a new potential innovation. If the problem is associated to the plan's design, the latter can be redesigned, repeating the respective stage again;

• **If needed, involve appropriate stakeholders in the process.** The SFSC initiative probably cannot go the whole way alone. It is advisable to check the network and surroundings of the SFSC initiative to identify the organisation(s) (university, technological centre, association, marketing company, etc) that can help you establish the plan and carry it out;.

• Results at any level of the implementation and go-to-market plan can even serve as a starting point to **obtain support from governments** (financial, facilities, etc) **and/or from potential collaborators/investors** for further develop or progress with implementation;

• **The plan should be adapted for each innovation and each SFSC initiative**. The plan should be tailor-made. The flowchart of Figure 6 should be adapted to the specific innovation and characteristics of the SFSC initiative. It could be very simple and short (a low-cost innovation already successfully tried by a farmer of the network) or very complex, covering 2 years (a high-cost innovation leading to a complete change in production method).

DESIGN OF THE IMPLEMENTATION PLAN

The first stage of the plan is to design the plan itself, **identifying metrics to measure the achievement of expectations in different stages and phases** as objectively as possible. Only by determining appropriate performance indicators will it be possible to verify whether the selected innovation is feasible and can function well in the SFSC initiative and to demonstrate what the core functions are and their impact on the value proposition.

First, **the plan's scope must be defined and adapted** to the specific circumstances. Sometimes it will not be necessary to go through all the stages in depth. Thus, the number and complexity of the stages and prototyping levels of the physical representation of the innovation during the scaling-up process (proof of concept, small or pilot prototype, minimum viable product) will depend, among others, on the type of innovation (technological, non-technological or social), the initial readiness of the innovation, the investment needed until obtaining a market (usually more in technological innovations), the SFSC's characteristics and the current competition. SFSC initiatives must therefore **answer questions** like what follows:

• Has the innovation already been validated by a third party? Do you have access to the results of this validation? Stage 2 of the plan (validation) may not be necessary; if so, you can therefore move directly to stage 3 (demonstration);

• What is the cost of implementation? If it is low, the economic risk if the process fails is also low, so the stages can be simplified to go to market as soon as possible. Conversely, if the innovation's cost is high, it may be a good idea to go slowly and move to the next stage only when clearly possible;

• Does this innovation have a major impact on your organisation? If the innovation is associated to major changes in your organisation the plan should be more complex than if the innovation were just a simple update or replacement of a current procedure.

Once the scope has been defined, ***what, how, who*** and ***when*** should be answered, not only to ensure reliable information but also to provide sufficient resources to accomplish the implementation and establish a respective timeline:

• What are all the **features of the innovation** and which ones are **critical or decisive?**

• What are the **stages** that need to be included in the plan?

• What will be the **reference model**? (a product, a process, a service, an instruction, an internal procedure, etc.)?

• What will the **up-scaling levels of the reference model for the different stages** be (proof of concept, small or pilot prototype, minimum viable product)? How will the solution more closely approach reality? What are the successive forms that it will have (physical prototype, place, document, session, website, etc)?

• What are the **expected changes with respect to your products and services or your organisation**?

• What will be the quantifiable **performance indicators** to be measured, which can porvide valuable information about achievement of the expected changes (organoleptic properties, nutritional properties, environmental impacts (waste, CO2 emissions, etc), shelf-life, number of consumers involved, consumer engagement level, sales, production cost, etc)?

• What will the **go/no go** criteria be for each performance indicator (20% cost reduction, product shelf-life extended by at least 10 days, 20 participants in an event, 10% increase in processing yield, etc)?

• How will the implementation **stages** be carried out? It is advisable to determine **milestones** from which to infer general and more specific **tasks and actions** that should happen to make possible the validation, demonstration and go-to-market stages;

• How will **performance indicators be measured and monitored**? It is necessary to determine the method (sensory analysis with an internal panel, physicochemical analysis, registered sales, number of consumers registered for an event, device to continuously measure electricity consumption, weighing of waste generated each day, etc);

• Who will be **in charge of each defined task**?

• Who will be **in charge of measuring each performance indicator**?

• Who will be **in charge of deciding whether to go further or not**?

• Who is the **target user** of the innovation and the reference model? The target commonly comprises the consumers of the product/service. But the innovation's target can also be the SFSC staff or local authorities, etc;.

• Who are the **external stakeholders** that must participate in the different stages? How and when will they participate?

• When will **each stage, task and action be performed**? Set start and end dates, determine and set **dates** for **periodical meetings** to control the status of achievements and progress of the actions (e.g. by checklist) and to detect and unblock potential bottlenecks, etc;

• When will **performance indicators be meas-**

ured and monitored?

Once the plan has been designed, it is possible to move on the next stage. In any case, it must be stated that the plan can be redefined in any of its aspects to complete any of the validation stages. **The design is thus something that can be updated and redefined according to the circumstances and results of the different stages of implementing the innovation**.

VALIDATION OF THE INNOVATION

The validation stage of the implementation journey involves **verifying that the innovation complies with the requirements, that its application is technically and economically feasible and that the improvements meet expectations**.

During validation the '**how**' questions must thus be answered: **how** the innovative solution **will be made, how it will look, how it will function** and **how the target user interacts and reacts** to the overall experience with the new product/service/procedure. All of this is verified by:

1) **Putting into practice** the innovation during **different up-scaling phases**, increasing the relevance of the results and the engagement of actors and stakeholders;.

2) **Measuring** the **performance indicators** in the **reference models** (whether prototypes, processes or consumers) set out in the implementation plan's design;.

3) **Analysing** the results of **performance indicators** and the scenario in which testing was carried out. (How did the test compare to expectations? What problems, if any, were encountered? What are/were the plans, options, or actions to resolve problems before moving to the next level?);

4) **Deciding whether to proceed to the next stage** of implementation, based on the plan's go/no-go criteria.

During the validation, different up-scaling phases and levels of a reference model associated to the innovation (a product, process, service, instruction or even internal procedure) can be tested. Initially, **3 up-scaling levels are proposed**: proof of concept, small prototype and pilot prototype (Figure 6).

The proof of concept is used to ensure that **the innovation can be applied** and that **it meets initial expectations (initial feasibility)**. It can be defined as **a quick check step** before kick-starting full validation of the innovation. This first move in the up-scaling process makes particular sense if the innovation is associated to a completely new concept for the SFSC initiative (new processing step, new product, etc) and/or it has a high cost even at early stages (new equipment with a high price, need for a new production plant, etc). Hence, if the results of the proof of concept are not good, the innovation process can be stopped without excessive consumption of the SFSC initiative's resources. The proof of concept would make no sense if the innovation has been implemented by a partner of the SFSC or its cost is low and affordable.

The proof of concept is typically a small internal project. **The proof of concept must be simple**; it may be a unique unit that can be produced using available technologies, facilities, and resources (new recipe (new ingredients) produced at kitchen level, modification of the variables of a process, etc), with or without the assistance of an external stakeholder. Thus, it may also be a preliminary test at the facilities of an innovation supplier, technology transfer centre or similar organisation. Aspects such as performance, usability, full features and all other customer-facing elements are not considered at this stage of the validation. In a relatively short time and employing few resources, a proof of concept can also help draw in stakeholders and investors for the next stages of the innovation's implementation.

The next level of the up-scaling process is the **prototyping phase**, following the proof of concept, but with a higher degree of complexity. It serves to **validate the innovation's strategic design direction, to discover errors and make changes**; it also helps **test how the target user interacts and reacts** to the overall experience with the new product, service or procedure, etc. During this phase, different levels of prototype complexity can be assessed, including resemblance of the final product/service, final capacities and final scenario of the respective use. Initially, at least 2 levels could be tested, a **small prototype** (low production, laboratory conditions, small equipment, low involvement of the final user) and a **pilot prototype** (large production, conditions closer to industrial ones, pilot equipment, high involvement of the final user).

The involvement of technology suppliers, R&D centres and other stakeholders is usually essential in the prototyping phase. As in the proof of concept, the tests can be done at the facility of an innovation supplier, technology transfer centre or similar organisation (e.g. testing a processing technology with your own product). If the innovation involves the implementation of technology, the technology can be purchased in several steps, either by acquiring higher-capacity equipment units or by duplicating the small

line. It is sometimes possible to rent the equipment in a first step and to discount the money invested in the final purchase. Larger print runs will enable **consumer tests** to be conducted with a pool of people (do they perceive and appreciate the differential features of the new product/service compared to conventional one?) and to balance costs, determine the next scale-up parameters, detect bottlenecks, simulate process performances, ensure clean and safe procedures, organise production, etc.

DEMONSTRATION OF THE INNOVATION

In the demonstration stage, **it must be proven that the innovation solves the problem in a close-to-real operating environment, including first market check**.

In the calling-up process, 2 levels are defined in this stage: the **minimum viable product** and the **market/demo sample** (Figure 6).

A **minimum viable product** is the one produced **in a close-to-real operating environment** (pre-industrial or industrial scale), from which it is possible to acquire relevant information and data to **ensure that results obtained in the validation stage are maintained at industrial scale**. It can be used to attract customers and validate a product idea early in the product development cycle.

The **market/demo sample** is the next step to be accomplished, if the results achieved with the minimum viable product are as expected. It serves to **initially check the product/service in the market before the full launch**. As the minimum viable product, it is produced in a close-to-real operating environment (pre-industrial or industrial scale). There are different ways to show that the innovation works at market level. The demonstration sometimes involves just one single high-impact event/act, to show that something exists or is true by giving proof or evidence in a competitive environment (market testing with a select group of customers, presentation at a fair, etc). It is never too late to abandon before the launch involves more commitment.

At this stage, ideally **all the key information and activities needed to prepare the go-to-market should be known, including** among others **the specific needs and requirements of customers, price** of the new product/service, **partnerships required** and **supply channels**.

Furthermore, based on all the information and data collected it is fully appropriate to establish the **foreseen sales and profit** based on the marketing plan and to evaluate all the r**isks of market failure**, preparing a contingency plan to resolve them.

GO-TO-MARKET

In the event that **the innovation is associated to a product or service** that is or will be sold by the SFSC initiative, **the final key and obvious stage is go-to-market**, the market launch (Figure 6).

To assure a higher probability of success, a revised **marketing strategy and tactics** must be developed, also including a plan with **go/no go criteria to stop commercialisation if the results are not as expected**. This operational plan must include different tasks that need to be fulfilled, timing for each and who is the responsible for them.

4. Examples of best practices of innovation

4.1 Technological Innovation

- Vending Machines For Agricultural Products
- Mobile Poultry Coops

4.2 Non-Technological Innovation

- Hermeneus Online Marketplace
- Common Trademark System

4.3 Social Innovation

- Employment For Handicapped People
- A Venue For Transformative Activities

Technological innovation

Vending Machines For Agricultural Products

Landwirtschaftskammer Niedersachsen, Germany

Company description

Landwirtschaftskammer Niedersachsen is an **agricultural administration and advisory institution** in the fields of agriculture, horticulture, and forestry. It is an **independent, self-governing legal entity** of public law, commissioned by the federal state of Lower Saxony.

Problem/s

Dedication to consumer **sales consumes time** and may interfere with daily production activities. Also, **consumers have limited access** to farm/production facilities; some consumers may be discouraged from acquiring products due to pick-up distance, limited opening hours, difficult public/private transportation access, etc.

Innovative solution applied

Installation of a **vending machine for farm products** that can be accessed by consumers 24 hours a day at a convenient location. Farmers have a new way to sell fresh food products directly to the public, without having to personally deal with consumers.

Cost-benefit analysis

The cost is **moderate** (€1,000-10,000). It d**oes not add value to the product**. However, it is a new sales channel which provides a **competitive position in terms of efficiency**, as the producers do not have to interrupt their work to sell the products.

Improving the value proposition

It can be applied to a wide variety of products, providing farmers with a new way to sell fresh food products directly to the public **24/7 at a convenient location, without having to personally deal with consumers**.

Technological innovation

Mobile Poultry Coops

Landwirtschaftskammer Niedersachsen, Germany

Company description

Landwirtschaftskammer Niedersachsen is an **agricultural administration and advisory institution** in the fields of agriculture, horticulture, and forestry. It is an **independent, self-governing legal entity** of public law, commissioned by the federal state of Lower Saxony.

Problem/s

Traditional poultry farming is not well perceived by consumers due to animal welfare issues. **Free-range farming of egg-laying hens is increasing**. However, silting, over-fertilisation and accumulation of parasites are **problems associated to this farming method**.

Innovative solution applied

Mobile **chicken coops are fully equipped, movable pens**, which can be used throughout the year to house chickens. Their movability and flexibility **prevent and/or reduces silting, over-fertilisation and accumulation of parasites**. The system can provide consumers with a transparent farming system that promotes animal welfare.

Cost-benefit analysis

The cost is **moderate** (€1,000-10,000), depending on the size of the module; **the increase in economic product financial value is low**.

Improving the value proposition

It can endow a company that uses this innovation as a **marketing claim and central value point** of its business model with a clear **competitive position**.

Non-technological innovation

Hermeneus Online Marketplace

Hermeneus World, Spain

Company description

The Hermeneus online marketplace is an initiative of Hermeneus World (Spain) for Spanish SFSC producers. This company specialises in the creation of online marketplaces and information and communications technologies (ICTs) to improve digital marketing.

Problem/s

In many cases, small producers **do not have enough resources to create and maintain their own websites and online shops**. Furthermore, **they do not have the resources for strong online promotion** and **consumers are not aware of the respective website and online shop**. From a marketing standpoint, establishing a trustworthy online identity is also a key to engaging consumers. Due to the SARS-CoV-2 pandemic, there is **increasing demand for online orders and home delivery**.

Innovative solution applied

Through an online marketplace, SFSC producers can have their websites hosted by a third party and sell their products online, controlling prices, delivery and payment methods. A good example is the **Hermeneus online marketplace** (https://www.hermeneus.es/). This digital marketplace collects the offerings of several SFSC members, generating a complete catalogue of different kinds of local food. **Consumers can easily and quickly buy their SFSC foods from different producers using only one tool (Hermeneus marketplace).**

Cost-benefit analysis

Hermeneus charges **a flat fee to host the producer in the platform**. But **there is no commission per sale** (neither for consumers nor for producers). The benefits for SFSC producers are several: creation of their **own online store and website, better service provided to current consumers**, and the ability to contact potential new consumers through the community, directly **connect with consumers** (no intermediary) and **be part of a community involved with local commerce**.

Improving the value proposition

Through a wide network of users, it is easier to reach the targeted consumer segment. An online business can begin operations, even with a small marketing budget. The direct interaction with consumers **enhances the relationship with them.**

Non-technological innovation

Common Trademark System

Éltető Balaton- felvidék Association, HUNGARY

Company description

The **Éltető Balaton-felvidék association coordinates the rural development activities of 59 settlements in North Balaton**, an attractive tourist area on the north shore of Lake Balaton known for its culture and cuisine. Its aim is to **support joint exploitation of resources, high-quality products and services** among scattered individual local producers and service providers, to enable better marketing, provide new trade channels and connect them with local/rural development programmes and actors.

Problem/s

Scattered local producers and service providers make high-quality products, though with a **low level of marketing, cooperation and connection with local/rural development programmes and actors.**

Innovative solution applied

The **Cooperating Balaton Uplands Trademark System** (https://eltetobalatonfelvidek.hu) **undertakes joint marketing of products from local and rural manufacturers and small producers**. It is a member of the **European Territorial Rural Quality** umbrella quality mark system. This quality mark **distinguishes special products in the region, helping promote products/services**. They have established 15 sales points, 13 in the area, 1 in a larger town, the seat of the county, and 1 in the capital Budapest. They also carry out **other marketing and promotion tasks** such as organising events and local exhibitions or maintaining a general website. The condition for use of a trademark is that **the producer must cooperate with at least one other trademarked producer.**

Cost-benefit analysis

A membership fee must be paid by members of the association. This is a cost-effective method for operating the joint marketing strategy, based on the differentiation of local SFSC products from a specific area.

Improving the value proposition

Communal participation helps improve and expand the quality, quantity and diversity of the services and locally manufactured products. The cooperation helps ensure preservation and renewal of environmental and regional values, expansion of the production and service opportunities and improvement of the rural inhabitants' quality of life. The activity's success is based on **differentiation from other products, services and regions through distinguishable quality and value for money.** The importance and benefits of joint marketing and the coordinated work combining local products and services, tourism and local culture is a visible success factor.

Social innovation

Employment For Handicapped People

Lantegi Batuak (NAIA), SPAIN

Company description

NAIA is a company located in Bizkaia in Basque Country which grows and produces **100% organic salads and pre-cut vegetables**, supporting the local agricultural sector. Behind this project is Lantegi Batuak, a non-profit organisation that generates job opportunities suitable for people with disabilities, to enhance their quality and development.

Problem/s

People with disabilities have problems finding jobs. Lantegi Batuak has a significant level of social understanding and tries to help resolve this issue. Moreover, there is **strong competition in the vegetable-producing sector.** The company need **unique marketing claims** to be different, find its niche and increase the added value of its products.

Innovative solution applied

All workers of the production line are handicapped people of the region.

Cost-benefit analysis

This social innovation does not have cost. Indeed, **Spanish government subsidises 50% of the minimum inter-professional salary of the disabled people hired**. This is a very interesting innovation from both the social and the economic standpoint.

Improving the value proposition

The employment of handicapped people is used as a marketing claim in the label of NAIA products (100% Social). The company also uses this social innovation as a central value point of its business model. Some people want to support this kind of social initiative in the region and positively evaluate the company's social awareness. **There are not many food companies which focus on improving social aspects.**

Social innovation

A Venue For Ransformative Activities

Allotropon, Greece

Company description

Allotropon is a venue where **members engage in social activities**. They make **social links with other members or the local community**. The Allotropon grocery store is home to Café Allotropon, which serves as a meeting point to exchange ideas and a venue for different events, such as food fairs, cultural happenings, public discussions and socially oriented actions.

Problem/s

Consumers may encounter difficulties when seeking venues to share ideas and network with people who have similar interests. **SFSC initiatives find it hard to engage consumers**.

Innovative solution applied

Allotropon is a venue where **members engage in social activities**. They make social links with other members or the local community. Members use the grocery store on a regular basis to exchange ideas with each other and with the local community. They organise the various **social events** that take place on the store's premises. Social economy actors supply the store with local **fair-trade products**. Agronomists regularly advise and **exchange knowledge** with members on quality and food safety issues.

Cost-benefit analysis

The cost of transforming the grocery store is **moderate** (€1,000-10,000) and depends, among others, on venue location and size.

Improving the value proposition

Members buy regularly as they feel engaged with the social activities and local fair-trade products. The company uses this innovation as a central value point of its business model.

Appendix A:

List of suggested questions to prepare the business model canvas

Description of the products and services (value proposition)

• Which products are sold by your company through SFSC initiatives? List them in order of importance for your business, indicating name, amount sold per month/year (t, kg), formats (e.g. 100, 500 and 1000 g), sale price, etc.

• Is the food of plant, animal or plant/animal origin?

• Is the product fresh?

• Is it a processed product?

• Is the product perishable?

• What is its shelf-life? Does it need cold/frozen storage?

• How is it packaged?

• What is the composition of the product? It is important to consider both positive and negative characteristics. For example:

  – Nutrients (vitamins, protein, etc). Have you analysed your product?

  – Is the product a special source of an essential nutrient/healthy component (any vitamin, high protein content, antioxidants, essential minerals (Ca, Fe, Mg, Se), etc)?

  – Does it contain any compound that could be harmful to health (pesticides, heavy metals (Hg, Pb) etc)?

• Is it a product with different ingredients?

  – What is the formula/recipe?

  – Do you produce all the ingredients or do you need to buy some of them? Are all of them local?

• Is your product a regional/traditional speciality?

• Can it be directly consumed, is it an ingredient for ulterior use or both?

• Do you produce organic foods? If yes: which of your product groups (cheeses, vegetables, fresh dairy, etc) are organic? What % of your total production is organic?

• Do you have any legal/regulated/certified quality label (EU organic food label, PDO, PGI, national label (specify), regional Label (specify), local Label (specify) or any other (specify))?

• Do you apply specific measures to reduce the environmental impact of your production?

• Do you employ any claim for marketing purposes in the product label, company website, etc (local product, traditional product, product without additives, healthy product, natural product, chemical-free production, food only produced in your region, premium/high quality, low carbon footprint, use of a novel technology (specify), environmentally friendly, social claim (specify), for vegans, non-GMO, free-range, others (specify))?

• Are your products based on any food trend (e.g. vegan foods)?

Appendix A:

• Are your products for a particular niche population with a special need (religion, health, etc; gluten-free, allergen-free, halal, kosher, vegetarian, infant food, etc)?

• Which services are sold by your company through SFSC initiatives (cooking course, course on how to farm food, etc)? List them in order of importance for your business, indicating name, amount sold per month/year (e.g. number of courses), number of people involved, sale price, etc.

Customers segments

• Regarding the people who consume your products (consumers):

- What are their characteristics?
- Are there different consumer groups?
- Do consumer characteristics differ according to the channel used?
- Which channels do consumers prefer?
- Do your consumer groups differ by gender, age, etc?
- Where do they live? Urban/rural area?

• If you also sell product through aSFSC intermediary (restaurants, speciality retailers, collectivities, etc):

- Who are they?
- Where are they located?
- What are their characteristics?

Supply channels

• What are your sales/distribution channels (own shop, cooperative shop, own online shop, online marketplace, door-to-door delivery (by phone or website), local markets, speciality retailers, consumer groups, vending machines, restaurants, collectives (hospitals, schools, etc), pick-your-own, community-supported agriculture, etc)?

• How much do you sell through each channel for each of your products?

• What is the cost of each of the cannels?

• Why are these channels used and not others?

Customer relationship and communication

• Do you have a communication plan? What are its key points?
• What type of contact do you have with consumers?

• Are the different consumer groups targeted differently?

• Do you have any measures to increase consumer engagement/purchases?

• Do you inform your consumers about the distinctive features of SFSC products?

• Do you have a method for receiving consumer feedback on your products (comments in social media, phone number, consumer focus groups, online consumer survey, etc)?

• Do you have a 'customer care service'?

• Which marketing and/or communication tools does your business (actively) use (website, social media, radio or TV advertisement, flyers, promoted events, attendance of events/fairs for local food, etc)? If it does use them, please list them in order of importance for your business and provide a brief explanation.

• If you employ social media, please specify which are you using, sorting them by the importance for your business, indicating the number of followers/contacts.

Social Media	Order of importance	N° of followers/ contacts
Facebook		
Twitter		
Instagram		
LinkedIn		
WhatsApp groups		
Other		

Appendix A:

• If you have a website or use social media, do you actively manage those channels? If the answer is yes, please specify how (by measuring visitors, followers; how they impact sales, etc).

• How is your product's label arranged? What information is in the label? Was it designed by a specialised company?

• Does the company have a logo? What is it? Was it designed by a specialised company? Is it shared with other farmers/producers?

• Why do you use these ways of communicating with your customers and not others? Do you know how customers want to be informed?

• Do you inform your consumers about the distinctive features of SFSC products?

Description of the key partners

• With which companies do you maintain signed/formal strategic partnerships (collaborators, alliances, joint-venture initiatives, etc)? List them in order of importance for your business, including name, location (region and country), what activities the partner(s) perform and the approximate number of interactions you have with each of them (monthly/annually). If needed, add more rows to the table.

• Which are your main suppliers? List name, location (region and country), what resources (seeds, fertilisers, packaging, etc) you acquire from the supplier(s) and the approximate number of interactions you have with each of them (monthly/annually).

• Who are your main buyers? Do you only sell your products directly to consumers? List them in order of importance for your business, including name, location (region and country), type (specialised retailer, restaurants, etc) and the approximate number of interactions you have with each of them (monthly/annually).

• With which governments/administrations do you have any kind of relationship? List them in order of importance for your business, including name, location (region and country), level (local/regional/national), nature of the relationship (local market organisation by small town council, grant or economic support, tourism initiatives coordinated by a local administration, invitation to working groups, invitation to fairs of organic products, etc) and approximate number of interactions you have with each of them (monthly/annually).

• Do you have any kind of relationship with other producers (farmer-to farmer network, membership in an association, etc)? If the answer is yes, please list the most important ones in order of importance for your business (name, location, what they do, kind of relationship and approximate number of interactions you have with each of them (monthly/annually).

• Do you share resources with any farmer or producer? Please specify what you share (farming machinery, storage facilities, fertilisers, seeds, common website, etc) and with whom.

• Do you have any connection with short food supply chain collaborative associations-initiatives? If the answer is yes, please list them in order of importance for your business, indicating whether they are local, regional, national or European initiatives.

• Do you have any connection with social/cultural/environmental associations-initiatives? If the answer is yes, please list them in order of importance for your business, indicating whether they are local, regional, national or European initiatives.

Appendix A:

Description of the key resources and activities

• Numbers of employees, including owner(s). People who work part-time or full-time under an employment contract, earning a salary. Include seasonal workers.

• Working hours per year, including hours spent by owner(s).

• What are the different departments of the company (management, administrative, marketing, etc)?

• What are the specific tasks of each person? What are the roles/kind of work done by the different people involved in the company (e.g. 5 farmers, 2 salespersons (include social media and website management), 3 administrative staff (include shipment management), 1 warehouse handler (also helps in the processing plant), 3 people at the processing plant, 1 general manager, 1 production manager)?

• What is the main infrastructure of the company (farming fields, buildings, own shop, etc)?

• Key technologies and machinery.

• For each product, describe the on-farm practices involved (planting, irrigation, pest management, harvesting, etc):.

a. How are they done?

b. What are their main characteristics (including cost)?

c. What are the variables/controlling parameters of those processes (e.g. irrigation time)?

d. What is the cost of each process per product unit?

e. What is the yield of each process?

f. What is the environmental impact of each process (water consumption, energy consumption, etc)?

• What are the post-harvest processes involved for each product (mixing, peeling, cutting, thermal treatments, fermentation, filtration, bottling, packaging, etc)?

a. How are they done?

b. What are their main characteristics?

c. What are the variables/controlling parameters of those processes (e.g. temperature and time in thermal processes)?

d. What is the cost of each process per product unit?

e. Which is the yield of each of the processes (e.g. peeling yield)?

f. What is the environmental impact of each process (water consumption, energy consumption, etc)?

• What are the main activities associated to distribution of your products (e.g. logistics)?

a. How are they done?

b. What are their main characteristics?

c. What is the cost of each activity per product unit?

Appendix A:

Finance and revenue streams[8]

• Total annual turnover (€) of the company for the last 3 years. Total annual turnover: total amount of money a business earns in a year, including taxes, i.e. the sum of your total sales.

• Total annual profit after taxes of the company (€) for the last 3 years. The profit of your business after paying the corresponding taxes. This is mainly calculated as total annual turnover minus company costs minus taxes.

• For each product/service and the last 3 years, how much does the practitioner earn (profit) for each unit sold (€/t, €/kg, €/packaged product, etc)?

• Average profit margin (% with respect to sale price) of each of the products sold in the last 3 years. Profit margin (%): the difference between the total cost of making and selling something and the price as sold. For example, if the average sale price of product A is €1/kg and the total production cost (including materials, fertilisers, labour, insurances, marketing, etc) is €0.75/kg, the average profit margin of product A is 25% (€0.25/kg).

• Has the SFSC initiative received any kind of grant or financial support from administrations/governments/private companies (at local, regional, national, European level)? If yes, specify administration/government, programme/call, for what, year and amount (€).

• Do you benefit from any tax reduction due to your activity (employing handicapped persons, SMEs, local production, R&D, etc)? If yes, specify the reduction and the administration.

Cost structure[9]

• For each of your products/services and the last 3 years, what is the production cost for each product/service unit (€/t, €/kg, €/packaged product, etc)?

• Total annual costs including taxes (€) of the company for the last 3 years.

• Annual taxes (€) paid by the company for the last 3 years.

• Annual labour cost (€) for the last 3 years, including labour cost of owner (s) if there is a payroll.

• Annual material cost (€) for the last 3 years (seeds, fertilisers, packaging, etc).

• Annual operating consumption costs (€) for the last 3 years (oil, electricity, water, phone, etc).

• Annual building, equipment and machinery cost (€) for the last 3 years (including depreciation/rent).

• Annual cost (€) in patents and property rights (e.g. licences) for the last 3 years.

• Annual cost (€) associated to quality labels/certifications (e.g. organic certification) for the last 3 years.

• Annual cost (€) in research & development & innovation for the last 3 years.

• Annual cost in marketing activities for the last 3 years (website, advertisement, etc).

• Annual insurance cost for the last 3 years.

8 If the company sell using SFSCs and conventional long chains, the best is to answer these questions considering both the whole company (SFSC+ non SFSC), and then SFSC and non SFSC products separately. It is key to understand the importance of SFCS in the company, possible difference of prices for the same product depending on the selling channel, etc.

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Appendix B:

List of suggested questions for knowing the SFSC´s surroundings: market characteristics, competitors and customers

General characterises of the market

• What are the main socioeconomic aspects of your selling zone/municipality/region?

- —Population
- —Population distribution by age/average salary/municipality or neighbourhood
- —Average salary
- —Salary distribution by age/municipality or neighbourhood
- —Rual/urban
- —Extension
- —Main food companies of your subsector

• What are the main cultural aspects of your region/municipality/sale zone with respect to food (consumption of more fish/meat/fresh vegetables than other countries/regions, food specialities, presence of native vegetable varieties or animal breeds, etc)?

• How much is the type/s of product/s or service/s you sell consumed in your sales zone/municipality/region?

• Which are the key stakeholders of the SFSC and/or your type of products/services in your sales zone/municipality/region? Do you have a relationship with all of them? If not, what is the reason?

Competitor profile

• Do you face a lot of competition in your sector?

• Have you noticed an increase in competition in the past 3 years?

• Who are your competitors (both long and short chains)?

• What are the characteristics of the products of your competition?

- —Do they sell cheaper or more expensive than you?
- —Are their products better or worse than yours?
- —Do they produce more or less than you?

• What is the key difference between their products and yours? Is it a matter of food characteristics and price or is there something else (human relations, good service, best marketing/promoting, etc)?

• Are these competitors in a better preference position compared to your company's offering company? Why?

• What are the strengths of the competitors?

• What are the weaknesses of the competitors?

• Are the competitors' products more attractive than yours? Why?

• What sales channels do they use? Are they the same as the ones you use?

• Do the competitors sell their products to other types of clients than you do?

Customers profile

• Regarding the people who consume your products (consumers):

—Who are your consumers?

—Are there different consumer groups? Do your consumer groups differ by:

* gender? If yes, approximately what percentage is female?

* age? If yes, approximately what percentage are the age ranges of young (< 30 years old), middle-aged (30-55 years old), seniors (+55);

* whether they live in an urban/rural area? If yes, approximately what percentage is rural/urban?

* any other factors (interests, ethical issues, environmental, economic level, available time for shopping, etc). If yes, please give details and approximate percentage of total sales that this segment comprises.

—Are they always the same or do they vary greatly over time? Are they loyal?

—Are you paid well (on time and on budget)?

—Regarding all these questions concerning consumers, can you answer them for each of the short food supply channels that you use? Do consumer characteristics differ according to the channel used? Which channels do consumers prefer?

• If you also sell products through an SFSC intermediary (restaurants, speciality retailers, collectives, etc):

—Who are they?

—Where are they located?

—What are their characteristics?

—Are they always the same, or do they vary greatly over time? Are they loyal?

—Do they always buy the same number of products?

—Are you paid well (on time and on budget)?

—Do you understand the purchase acts and patterns of each customer?

—Do you have a list of potential customers you are not selling to yet? Who are there? Why do you not sell to them?

• Why do you think consumers/SFSC intermediaries buy your products? What are the most important factors/drivers/motivations for them when shopping for food products (freshness, taste, quality, price, convenience, human factor, etc)? Do those reasons differ according to type of product or retail channel?

• Why do you think consumers/SFSC intermediaries buy the products of your competition? What are the most important factors/drivers/motivations for them when shopping for the competition's products (freshness, taste, quality, price, convenience, human factor, etc)? Do these reasons differ according to type of product or retail channel?

• What are the main obstacles to buying food products for customers/SFSC intermediaries?

• Are the consumers/SFSC intermediaries willing to pay more for some of your food products? For what kind of products or product attributes?

• In your view, how aware are consumers/SFSC intermediaries of the social and environmental impact of current food production? Are they aware of the distinction between short and long food supply chains? Do you actively explain these aspects to your consumers and clients?

• What do you think the consumers' and SFSC intermediaries' wants/needs/values are when it comes to your products? Does this differ according to different consumer/SFSC intermediary characteristics?

• Do you know if consumers/SFSC intermediaries want to know about your business/products/services? About the food production process/benefits (health, environmental, support for local economy? Percentage of profit earned through direct selling as compared to long chains?

• Do customers/clients positively perceive the brand/policy of the company?

• Do customers/clients perceive the transparency of the company (win-win relationship, consumers well-informed about attributes and production, fair prices for both, etc)?