

# 19

## *Lessons Learned on Resilience from a Multi-scale Co-creation Methodology From Regional to European Scale*

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### 19.1 Introduction

The farming systems (FSs) in Europe faces a broad array of challenges. The ability of FSs to deal with challenges can be assessed with the concept of resilience (Chapter 1). Assessing FSs' resilience is a complex issue (Folke, 2016; Meuwissen et al., 2020) and can benefit from the stakeholders involvement to move towards a better understanding of the dynamics and interactions that should be addressed. Co-creation is gaining interest as a method to involve stakeholders in reaching the applied research goals (Füller et al., 2011; Prahalad and Ramaswamy, 2004; Romero and Molina, 2009). Due to its interactive nature, co-creation facilitates innovation processes (Frow et al., 2011; Jaakkola et al., 2015) and leads to strong stakeholder engagement and awareness (Byrd, 2007; Carmin et al., 2003).

Co-creation activities can be conducted in physical and virtual modes. Focus groups and workshops are traditional physical meetings (Kamberelis and Dimitriadis, 2011; Nanz and Steffek, 2004; Wilkinson, 2004). Digital platforms (also called virtual communities) are rapidly gaining ground, providing stakeholders a new space for interaction and information and opinion sharing. There are several reasons explaining the importance of the digital platforms over the physical modes. First, the digital platforms overcome the physical barriers of the face-to-face activities, favouring the participation of

stakeholders from different countries and the assessment of issues at multiple regional scales of integration. Second, the digital platforms offer the participants the option to run the online activities over a longer period of time, leading to closer relationships and sense of community (Füller et al., 2009; Gebauer et al., 2013). Third, digital platforms allow time flexibility for participants, meaning that they can select and participate in the online activities at any time (Füller et al., 2009; Sawhney et al., 2005; Stanke, 2016).

The aim of this chapter is to address how European FSs' resilience assessment can benefit from involving stakeholders using a multi-scale co-creation methodology. The co-creation activities were organized at two different spatial scales – regional and European scales – and combined physical and online stakeholder deliberations. According to Reed (2008), replication of participatory processes at multiple scales increases validity through comparison/triangulation and effectiveness as more relevant stakeholders can be involved.

The remainder of this chapter is structured as follows. First, the multi-scale co-creation methodology is explained. Second, the results are presented into two sub-sections: current resilience assessment and resilience in the future. Third, conclusions are drawn.

## **19.2 Multi-scale Co-creation Methodology**

The multi-scale co-creation methodology consisted of conducting in parallel the same co-creation activities on the same resilience assessment topics at two different scales: the regional and European. To this end, two different co-creation modes were designed: physical meetings to co-create with stakeholders, who are knowledgeable and experienced in the farming system they belong to (FS stakeholders), and a digital co-creation platform to co-create with stakeholders, knowledgeable and experienced in the European FSs as a whole (European stakeholders). In total 360 stakeholders participated in the co-creation process: 233 FS stakeholders participated in physical meetings and 27 European stakeholders participated in the digital co-creation platform (Table 19.1). The stakeholders who participated in the physical meetings did not participate in the digital co-creation platform, and vice versa.

As Table 19.1 shows, the stakeholders were participating in co-creation activities related to current resilience assessment topics

**Table 19.1. Topics in the current resilience and resilience in the future assessed by stakeholders in the physical meetings and the digital co-creation platform**

		Physical meetings			Digital co-creation platform
		Risk Management focus groups	SURE-Farm FOPIA-workshops	Co-design policy workshops	
		11 FS-78 FS stakeholders	11 FS-184 FS stakeholders	6 FS-71 FS stakeholders	27 European stakeholders
Resilience assessment topics Current resilience	Challenges				
	Functions				
	Resilience attributes				
	Resilience capacities				
Resilience in the future	Improved strategies				
	Resilience-enabling policies				

Source: Own elaboration. Grey colour indicates that the resilience assessment topic was assessed in the corresponding co-creation mode

(Chapter 1): (i) Identify the challenges threatening the European FSs.<sup>1</sup> The perceived challenges are classified according to the duration of the impact of the challenge (shocks and long-term pressures) and its nature (economic, environmental, institutional and social) (Meuwissen et al., 2019). (ii) Identify and assess the performance of European FSs functions. Functions of the FSs are classified into two groups: the provision of public goods and private goods (Chapter 1). (iii) Assess the presence of resilience attributes in the European FSs. Stakeholders also participated in the assessment of topics related to resilience in the future: (i) Co-create improved strategies to deal with challenges. Strategies are classified in risk-sharing strategies and on-farm strategies. (ii) Co-design policies that enable resilience.

Co-creation activities provided quantitative and qualitative information regarding the stakeholders' perceptions on resilience topics at two different scales. Quantitative information was assessed by applying frequency analysis and analysing descriptive statistics. Qualitative information was assessed by following a qualitative analysis that entailed the elaboration and coding of collected information (Maxwell, 2005). As a result, convergent and divergent perceptions between FSs and European stakeholders were identified.

### 19.2.1 *The Physical Meetings*

A diverse set of physical meetings were organized through the whole project to involve the stakeholders in FS resilience assessment (Chapter 1). The activities conducted in three physical workshops were replicated on the digital co-creation platform.

Participatory sustainability and resilience assessment workshops (SURE-Farm FoPIA workshops) were held between November 2018 and March 2019 in eleven FSs.<sup>2</sup> The activities revolved around

<sup>1</sup> The activities defined to assess the challenges threatening FSs were different in the co-creation approaches. Participants in the focus groups agreed with the challenges previously identified in 1,890 farmer's surveys on risk perception and risk management decision making. In the digital co-creation platform, participants selected the ten most important challenges from a list of forty-five challenges threatening European farming systems.

<sup>2</sup> FSs covered different sectors, farm types, products and challenges. They included large-scale arable farming in Northeast Bulgaria; intensive arable farming in Veenkoloniën, the Netherlands; arable farming in the East of England (United Kingdom); large-scale corporate arable farming with additional livestock

the assessment of the relevance and perceived performance of the FS functions, the strategies implemented to reduce the impact of the challenges on the FS functions, and the perceived presence of the resilience attributes and their perceived potential contribution to the FS resilience capacities (Reidsma et al., 2019).

Between April 2019 and September 2019, risk management focus groups were conducted in the eleven FSs. The aim of the focus group was to identify the challenges threatening the FSs and the strategies to deal with them as the basis to co-create improved resilience-enabling strategies. Stakeholders also assessed the contribution of risk management to FS resilience (Soriano et al., 2020). The focus groups built on results from a survey of 1,890 farmers on risk perception and risk management decision making (Spiegel et al., 2019).

Finally, between November 2019 and January 2020 co-design policy workshops were conducted in six FS.<sup>3</sup> The stakeholders were involved in identifying promising policy options for the CAP and its national implementations for maximizing its support to more resilient EU farming systems. In addition, a final workshop was organized in Brussels with fourteen Brussels-based experts from different backgrounds, to discuss and validate the national workshop and digital co-creation platform findings and share reflections on the proposed policy options (Buitenhuis et al., 2020; Candel et al., 2020).

The leaders of the SURE-Farm FoPIA workshops, risk management focus groups and co-designed policy workshops provided guidelines to conduct the activities in the same manner in every case study. The guidelines also described the selection criteria to invite participating stakeholders. The leaders of the workshops encouraged the participation of a wide variety of the stakeholders representing the FS actors, i.e. farmers and farmers' organizations, cooperatives, value chain actors,

activities in the Altmark in East Germany; small-scale mixed farming in Northeast Romania; intensive dairy farming in Flanders; extensive beef cattle systems in the Massif Central; extensive sheep farming in Northeast Spain; high-value egg and broiler systems in Southern Sweden; small-scale hazelnut production in Lazio, central Italy; and fruit and vegetable farming in the Mazovian region, Poland.

<sup>3</sup> They included intensive arable farming in Veenkoloniën, the Netherlands; arable farming in the East of England; intensive dairy farming in Flanders; extensive sheep farming in Northeast Spain; small-scale hazelnut production in Lazio, central Italy; and fruit and vegetable farming in the Mazovian region, Poland.

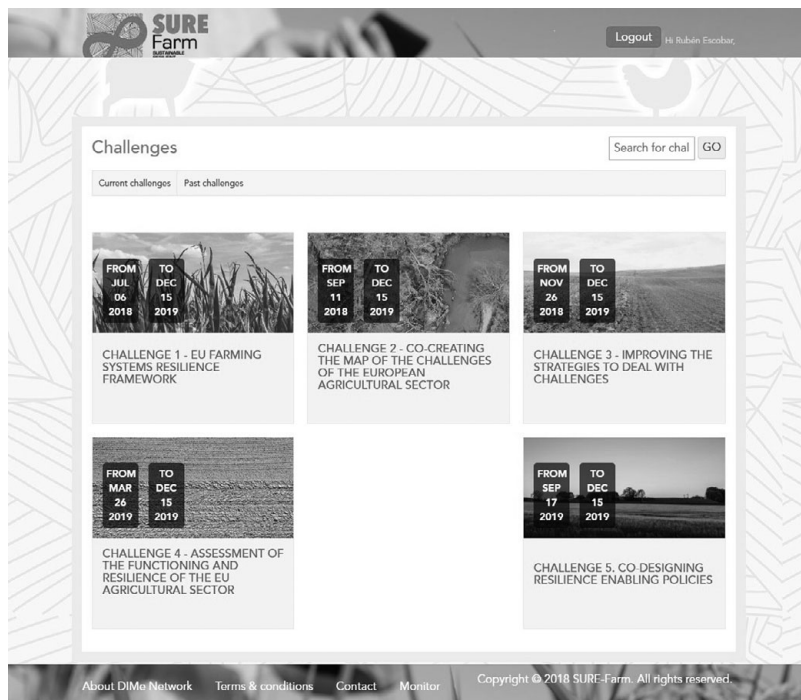
financial institutions, environmental and consumers' organizations, university and research centres and policymakers among others.

### 19.2.2 *The Digital Co-creation Platform*

The SURE-Farm digital co-creation platform operated from July 2018 to December 2019 aiming to assess and improve the resilience of FSs in Europe. The existing digital co-creation platforms are classified according to the degree of openness. In the "Crowd of people" digital platform participation is free, while access is limited in the "Group of experts" digital platform in which selected experts who meet certain specific criteria are invited to co-create innovations and breakthrough ideas (Orcik et al., 2013). The SURE-Farm co-creation platform is a group of expert digital platforms in which the following selection criteria were defined: (i) proven experience and background in the agricultural sector at national/European level; (ii) having knowledge about or surrounding risk management, policy, farm demographics and/or agricultural production; (iii) working in public or private organisations in any of the following activity areas: farmers organizations, policy-makers, insurance companies, banks, research centres and universities, value chain actors, environmental NGOs, consumer associations; and (iv) pertaining to one of the next staff category: experts, managers or directors.

The general goal of the digital co-creation platform was to assess the resilience of the European FSs. The online activities on the digital co-creation platform were organized under specific goals (challenges) (Figure 19.1) that correspond to key topics in resilience assessment.

The activities in the digital co-creation platform were carefully designed to attract the interest of the stakeholders. To this end, the activities were intuitive and demanded little time, were accompanied by a detailed explanation about the aim and how to conduct them and were organized under flexible schedules to facilitate participants to fulfil the activity. Furthermore the participation was intensely moderated to keep the participants engaged in the digital platform by: (i) sending weekly/biweekly newsletters with new activities on the platform, articles and videos of interest; (ii) running a repository of reports, scientific papers and videos; (iii) sending alerts on new entrants in the digital platform to encourage networks; (iv) sharing results of previous activities to foster two-way feedback; (v) defining and publishing



**Figure 19.1** Interface of the challenges defined in the digital co-creation platform.  
 Source: SURE-Farm co-creation platform

rankings based on the participation in the activities; and (vi) awarding economic prizes to those topping the participation rankings. Two 500€ awards were granted to the top participants in challenges 1–4 (Figure 19.1) in May 2019 and two 250€ awards were granted to the top participants in challenge 5 (Figure 19.1) in December 2019.

Ninety-seven European stakeholders were contacted by e-mail, of which sixty logged-in the digital co-creation platform and twenty-seven actively participated in nineteen online activities. Stakeholders from eight European countries participated in the activities, where Spain and the Netherlands contributed the largest numbers of participants.<sup>4</sup>

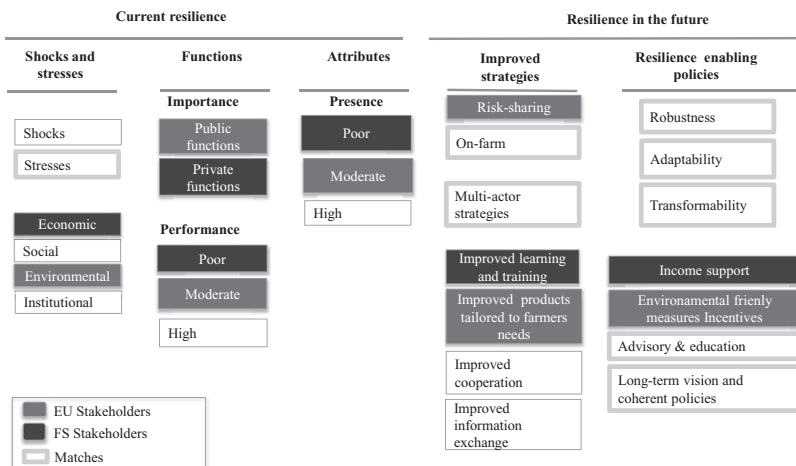
<sup>4</sup> Participants per country: Spain (11), the Netherlands (6), United Kingdom (3), Germany (2), Switzerland (2), Belgium (1), France (1), Italy (1). Participants by activity sector: university/research center (9), financial institutions (7), farmers' organizations (6), policymakers (2), value chain actors (2), environmental NGOs (1).

Six sectors are represented by participants, with a greater presence of farmers' organizations, financial institutions (banks and insurance companies) and university and research centres.

To foster the stakeholders' engagement with SURE-Farm goals, additionally, a representative selection of the stakeholders participating in the digital co-creation platform (steering group) was invited to participate in two physical SURE-Farm consortium meetings and join in the SURE-Farm partners' reflections on resilience. The meetings were held on 19 April 2018 and 25 September 2019, and nine and five EU stakeholders attended, respectively.

### 19.3 (Mis)matches in the Stakeholders' Perception about Current Resilience and Resilience in the Future

As presented in Figure 19.2, both matches and mismatches were identified across different co-creation methods. The boxes highlighted in grey scales represent mismatches in the perception on the key resilience assessment topics between EU stakeholders (light grey) and FS stakeholders (dark grey). The grey-framed boxes illustrate matches



**Figure 19.2** (Mis)matches in the stakeholders' perceptions about current resilience and resilience in the future.

Source: Own elaboration

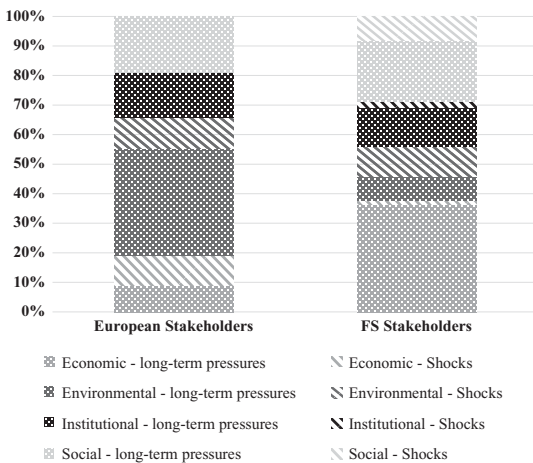


between EU and FS stakeholders. When presenting the major results for perceived current resilience, we focus on the three elements of the resilience framework: shocks and stresses (Section 3.1.1), FS functions (Section 3.1.2) and resilience attributes (Section 3.1.3). As the major results for the assessment of resilience in the future, we distinguish between improved future risk management strategies to enhance resilience (Section 3.2.1) and policy recommendations aiming to enhance the resilience-enabling capacity of the CAP (Section 3.2.2).

### 19.3.1 Current Resilience

#### 19.3.1.1 The Challenges of the EU Farming Systems

The findings in Figure 19.3 indicate that both European and FS stakeholders were more concerned about long-term pressures than shocks. However, different perceptions between stakeholders are identified regarding the nature of the perceived long-term pressures. European stakeholders perceived environmental long-term challenges, such as global warming, water scarcity and pollution, change in precipitation patterns and decline of pollinators, to be the main challenges to deal



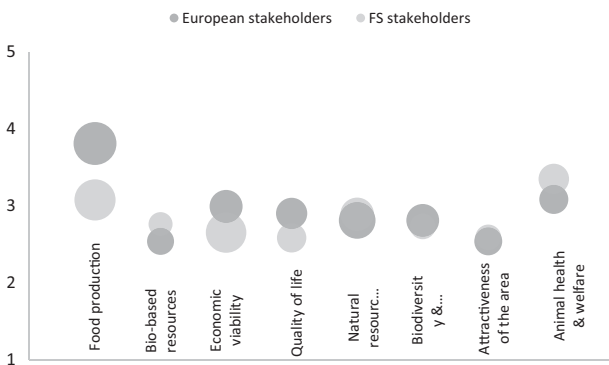
**Figure 19.3** The stakeholders' perception of the challenges of the European farming systems. The percentage show the number of times the challenge has been mentioned by stakeholders in relation to the total number of mentions.

Source: Own elaboration

with in the future. In contrast, FS stakeholders were mostly concerned by economic long-term challenges, such as decline in profitability forced by constantly increasing production costs and decreasing food prices. This is in line with Assefa et al. (2017), who found that farmers, wholesalers, processors and retailers were more concerned about long-term price changes than with short-term price volatility. Social and institutional long-term pressures also concerned the stakeholders. For example, European stakeholders highlighted the lack of generational renewal and FS stakeholders noted farmers' quality of life.

### 19.3.1.2 The Functions of the EU Farming Systems

European stakeholders perceived a more balanced importance of functions at the European level than FS stakeholders at the regional level. As a result, greater importance is allocated to social and environmental functions by EU stakeholders, while FS stakeholders highlighted the importance of economic functions. FS stakeholders named provision of private goods, such as food production and economic viability, as the most important functions of the FS explaining that these functions could influence other FS functions. In contrast, European stakeholders nearly unanimously stressed on maintaining of natural resources and biodiversity and habitat – both public goods. Both European and FS stakeholders highlighted the importance of food production (Figure 19.4).



**Figure 19.4** Perceived importance (size of circles) and performance (y-axis) of FS functions. Scale from 1 to 5; where 1: very poor, 2: poor, 3: moderate, 4: good, 5: perfect performance.

Source: Own elaboration

Regarding the performance of the functions, there was a consensus among European and FS stakeholders that the functions of the European FSs show a low performance. Performance of private functions was assessed higher by European stakeholders than by FS stakeholders. As for public functions, European and FS stakeholders reported similar low performance levels. Lower performance of food production perceived by FS stakeholders might be due to a link they perceived between food production and economic viability, i.e. stakeholders might perceive higher production to be necessary to maintain economic viability. For the EU stakeholders, rather a trade-off between food production and environmental and social functions might be more obvious. Indeed, trade-offs between economic or production functions on the one hand and environmental functions on the other hand are well studied at different levels. For instance, Teillard et al. (2017) show for France that selective optimization of either food production or ecosystem services at the regional level can provide a win-win solution at the national level. Similarly, Schulte et al. (2019) show that prioritization of a few out of multiple soil functions per member state of the EU can help to achieve goals at the EU level. Trade-offs at lower levels may indeed lead to better results at higher levels. Unfortunately, studies presenting a trade-off between social and environmental functions are not common. Low social performance can be related to multiple causes, including a bad public image, low profitability, lack of political willingness and lack of facilities in rural areas. These causes are hard to quantify and model, making participatory multi-level co-creation activities more suitable to perform multi-level trade-off and synergy analyses.

### 19.3.1.3 The Resilience Attributes of the EU Farming Systems

Having identified challenges and FS functions, stakeholders were asked to assess pre-defined resilience attributes – characteristics of the European FSs that are supposed to convey resilience to a system (Cabell and Oelofse, 2012). Both European and FS stakeholders agreed on the key resilience-enhancing attributes, namely: (i) “Reasonably profitable”;<sup>5</sup> (ii) “Production being coupled with local and natural

<sup>5</sup> Individuals involved in agriculture are able to make a livelihood from the work they do without relying too heavily on subsidies (Cabell and Oelofse, 2012).

capital”;<sup>6</sup> (iii) “Heterogeneity of farm types”;<sup>7</sup> (iv) “Social self-organization”;<sup>8</sup> and (v) “Infrastructure for innovation”<sup>9</sup> (Paas et al., 2019).

Stakeholders also agreed on the low presence of these attributes in the FS when explaining low performance of FS functions. Yet, European stakeholders were generally more positive about the presence of these resilience attributes at the European level, than FS stakeholders at the FS level. *Reasonably profitable* was perceived to have a low presence, but was expected by local and European stakeholders to perform as a buffer for many shocks. European stakeholders perceived a higher presence of *functional and response diversity* for the EU FSs, e.g. through insurance. *Heterogeneity of farm types* was also perceived to have a higher presence for the European FSs, which could be seen as the result of the aggregation of the diverse FSs each with their own degree of specialization. *Social self-organization* of the European FSs and its connections with actors outside FS boundaries was also perceived higher and probably relates to the fact that at the European level, policy development is included within the system boundaries. Regarding legislation, European stakeholders perceived that *legislations are moderately coupled with local and natural resources*. On the contrary, FS stakeholders perceived that policy goals and instruments do not meet the FS needs. *Reasonably profitable* is perceived to have a low presence currently, but is expected by European and FS stakeholders to perform as a buffer for many shocks. *Optimal redundancy* of farms was the only resilience attribute whose presence was perceived lower by European stakeholders than FS stakeholders. This attribute relates to generational renewal and lack of successors and may currently be seen as an opportunity for some FS actors to expand, while being a challenge for many policymakers at the national and European levels.

The more positive perception of the presence of resilience attributes of the European stakeholders compared to the FS stakeholders might

<sup>6</sup> The systems function as much as possible within the means of the bioregionally available natural resource base and ecosystem services (Cabell and Oelofse, 2012).

<sup>7</sup> Patchiness across the landscape (Cabell and Oelofse, 2012).

<sup>8</sup> The social components of the system are able to form their own configuration based on their needs and desires (Cabell and Oelofse, 2012).

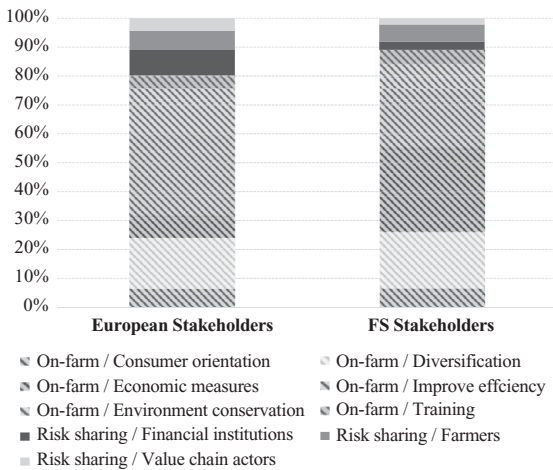
<sup>9</sup> Existing infrastructure facilitates knowledge and adoption of cutting-edge technologies (e.g. digital) (Reidsma et al., 2019).

be related to several aspects: (i) at the EU level, the diversity in farming and the enabling environment is richer than the diversity within the FSs panel; (ii) European stakeholders may be better informed than FS stakeholders regarding response diversity, infrastructure for innovation, legislation and policies, e.g. new ways of insurance or innovative environmental management practices, including supporting policies at the EU level; and (iii) at the same time, European stakeholders might be less informed on how the effects of resilience attributes can trickle down to specific FSs, taking into account local conditions.

### 19.3.2 Resilience in the Future

#### 19.3.2.1 Improved Strategies

Although both European and FS stakeholders mainly mentioned on-farm strategies (Figure 19.5), there are interesting differences between the stakeholder’s perceptions with respect to on-farm strategies. The European stakeholders primarily mentioned strategies towards sustainable and efficient management of natural resources and adaptation to/mitigation of climate change: (i) improve chemical inputs (pesticides,



**Figure 19.5** Strategies to deal with future challenges proposed by the stakeholders. The percentages show the number of times the strategy has been mentioned by stakeholders in relation to the total number of mentions.

Source: Own elaboration

fertilizers) management, (ii) implement water and soil optimization strategies, (iii) transition to organic farming; (iv) adapt plant varieties and (v) design climate emergency response plans. The FS stakeholders clearly prioritized the strategies targeting economic measures, such as increasing profitability (reducing cost, increasing prices), dispose of financial buffers, gaining scale economy by increasing farm size (new building, lands acquisition), improving labour and workers management and adapting to new regulations. Reidsma et al. (2000) also found a mixed of technological and ecological strategies to deal with future challenges.

As for risk-sharing strategies, European stakeholders perceived insurance contracts to be the most interesting strategy to share risks with financial institutions. These results are in line with previous studies where insurance schemes are perceived as efficient tools to manage risk and uncertainty (Heyder et al., 2010; Meuwissen et al., 2001).

Stakeholders were also asked to design improved risk management strategies towards more resilient FSs. For this purpose, stakeholders identified actors involved in the risk management strategies, analysed their roles and generated ideas on how actors' performance could be improved for better risk management. Stakeholders provided more than 500 ideas. The assessment of the stakeholders' ideas led to four main pillars to improve risk management: (i) fostering learning and training, (ii) reinforcing knowledge and information exchange, (iii) promoting FS stakeholders' cooperation and (iv) adapting and developing new products and services tailored to farmers' needs. These pathways are interlinked, as information exchange is important to adapt insurance services to farmers' needs (Lunt et al., 2016), and cooperation enhances learning, training and advisory processes (Hermans et al., 2015). Yet, the European and FS stakeholders did not prioritize these improvements in the same manner. While FS stakeholders highlighted fostering learning and training, European stakeholders prioritized adaptation or definition of new products better suited to farmers' needs. As agriculture is constantly shifting and changing, farmers and other actors in the FSs were aware that they need to be up-to-date and participate in continuous learning and training programs on farm management, new technologies and financial planning. Although European stakeholders also perceived learning as a way to improve risk management, their ideas were mostly centred

on the need for defining new income, contracts with suppliers and consumers, and insurance products. To this end, all four pathways are in line with the literature (Heyder et al., 2010; Meuwissen et al., 2001; Šūmane et al., 2018).

There was a general consensus between FS and European stakeholders that improving risk management requires joint actions, i.e. every actor involved in the strategies' implementation has the opportunity to improve risk management in FSs. It is not surprising that farmers and farmers' organizations were identified as the key actors to improve risk management in FSs being able to: (i) improve information exchange by keeping up-to date online information about prices, technologies, policies, new challenges, good practices in financial/management planning; (ii) foster joint training programs with other actors in the FSs regarding challenges, long-term management planning and cooperation; and (iii) enhance cooperation by collecting good practices in terms of cooperation in agriculture, creating networks at different regional levels and creating a joint job exchange for actors in FSs. According to the literature, local and regional learning communities are indeed important channels to share good practices, information and knowledge between farmers (Laforge and McLachlan, 2018; Thomas et al., 2020). Value chain actors, such as input providers and distributors, were also relevant to improve risk management. More specifically, value chain actors may (i) improve the provision of updated information about new technologies/products and joint initiatives and good practices in the value chain (also confirmed by Cholez et al., 2020), (ii) boost the training programs on sustainable practices and input/machinery usability options and look for new joint training programs with other actors in the FS, (iii) lease machinery for experimenting and (iv) develop a comprehensive contract along the supply chain. Finally, opportunities for financial institutions to improve risk management were proposed, namely (i) improve the information exchange by increasing the number of consultants in the rural areas with deep knowledge in the specificities of the FS; (ii) reinforce cooperation to exploit potential synergies between financing and insurances products; (iii) ensure less complex, automatic and digital access to financial services (apps); and (iv) adapt or develop new products to better fit farmer's needs. Examples of the latter include adapted debt payments to the farm cash flow, definition of beneficial conditions for high innovative and/or environmentally friendly projects, broadening

guarantees and providing insurances to cover new environmental- and climate-change-related emerging risks based on satellite data.

### 19.3.2.2 Resilience-Enabling Policies

Comparison of the policy recommendations that followed from the workshops and the digital co-creation platform mainly revealed similarities in stakeholders' views on how policies can strengthen robustness, adaptability and transformability of European FSs.

More specifically, increasing incentives for adopting agri-environmental and climate measures were clearly recommended by European and FS stakeholders, such as converting the basic payments into more result-based payments related to agri-environmental and climate outcomes (though differences can be depicted in the FS). A much-preferred policy intervention, at both the FS and European levels was to increasingly encourage social learning processes for exchanging knowledge and promoting cooperation, e.g. through advisory services, training services, education programs and public-private collaborations. The CAP was regarded as having an important function of communicating about developmental directions for the future of European FSs. Such a long-term vision should be based on norms and priorities and a clear sense of the vulnerabilities of European FSs. Moreover, the CAP could include clear and coherent policy objectives and instruments that reinforce rather than undermine each other.

The results are in line with other project's deliverables. Feindt et al. (2019) found that the CAP and its national implementations support the robustness of different FSs to varying degrees, provide less support for adaptability and often even constrain transformability by incentivizing the status quo. In addition, Buitenhuis et al. (2019, 2020, chapter 4) concluded that the ways in which multilevel policy configurations enable or constrain the resilience capacities are experienced very differently across European FSs depending on the systems' context (regional context, challenges and national policy framework). These studies imply that developing policies for improving the resilience of FSs requires a comprehensive understanding of FSs' characteristics and contexts.

## 19.4 Conclusions

Three lessons are drawn from the application of the multi-scale co-creation approach on resilience assessment in SURE-Farm.



First, co-creation is an advisable method to engage stakeholders in research projects. The SURE-Farm experience shows that co-creation allowed the stakeholders to actively follow almost the whole lifetime of the project. Co-creation has been defined as a cross-sectional methodology in the project and hence its results fed into and enriched other research activities conducted to address the risk and challenge perception, the strategies to deal with challenges, the resilience impact assessment and the definition of enabling resilience policies.

Second, we learnt about the key advantages and shortcomings to overcome in future co-creation processes. Physical meetings allowed capturing the great diversity across FSs in Europe. This is a valuable insight to foster strategies and policies that respond to farming system characteristics and needs. Regarding the digital co-creation platform, one of the main challenges was to keep stakeholders engaged in the platform activities during the project lifetime. Learning from experience, digital co-creation platforms targeting complex issues require a solid multidisciplinary team of (i) researchers to set clear goals and formulate questions, (ii) co-creation experts to translate the goals and questions into simple and attractive digital activities, (iii) technical experts to develop the platform functionalities for performing designed activities and (iv) communication experts to keep stakeholders engaged. All these ingredients are essential for a successful digital co-creation process. Furthermore, flexible selection criteria are needed to adapt the potential participants to the participation needs to reach the co-creation goals.

Third, the multi-scale approach is one of the major contributions of the SURE-Farm co-creation process in resilience assessment. Working in parallel with stakeholders knowledgeable and experienced at the regional and European scales broadens the knowledge about resilience by identifying convergent and divergent perceptions on different resilience assessment topics. While we identified several matches in the perceptions, we observed some striking mismatches as well. On the one hand, European stakeholders prioritized environmental long-term stresses, public functions and risk management strategies targeting environmental challenges. On the other hand, we observed that FS stakeholders perceived economic challenges, private functions and economic risk management strategies as most important. The European stakeholders seem to be more optimistic when assessing resilience at the European FSs level.

The perceptions' divergence may have policy implications. Mismatches in the stakeholder's perceptions may explain the existing gap between the European policies, influenced and designed by European stakeholders', and the FSs' diverse needs illustrated by the FS stakeholders. The latter are mainly farmers and other mutual dependence actors who are close to business and remain primarily worried about the unsolved economic issues while European policies move forward to foster the greater balance between environmental and economic issues.

Finding the way to reduce this gap seems crucial to make the European FSs more resilient. Within the scope of agricultural policy, the CAP 2020, as it is defined in the proposal, succeeds in adding the eco-schemes defined by each Member State in the system of farm support mechanisms. Eco-schemes will be based on quite specific climate, geographical and socio-structural parameters. We thus conclude that the discrepancy might be solved within a common framework of support but flexible enough to stimulate the broad range of farmers' responses with the potential to success in their own context.

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