SUSTAINABLE RESILIENT EU FARMING SYSTEMS

Perceived resilience capacities across EU farmers

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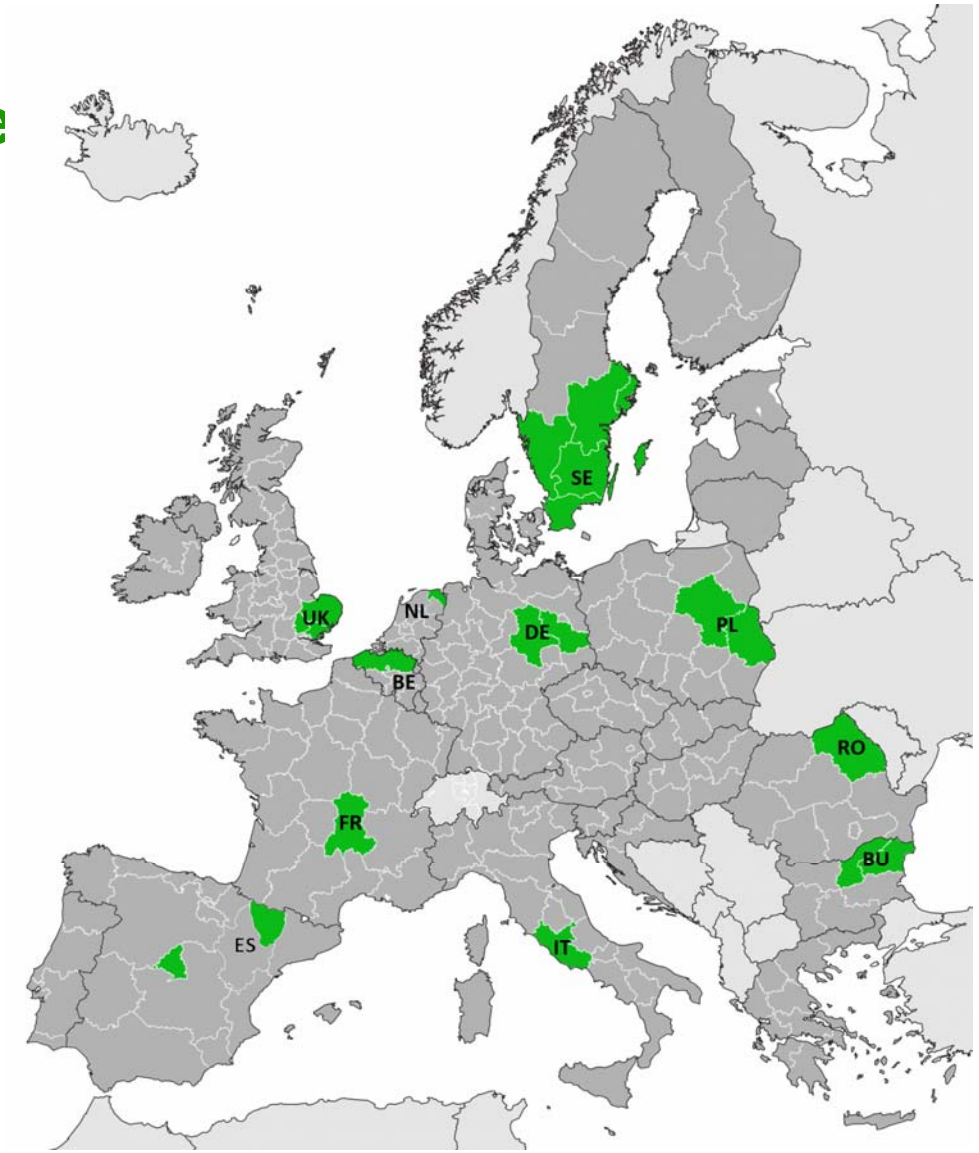
11 case study regions are heterogenous in terms of size and specialisation

Case study region	Sample size
BE	220
BU	30
FR	50
DE	30
IT	60
NL	30
PL	70
RO	122
ES	120
SE	64
UK	200
Total	**996**



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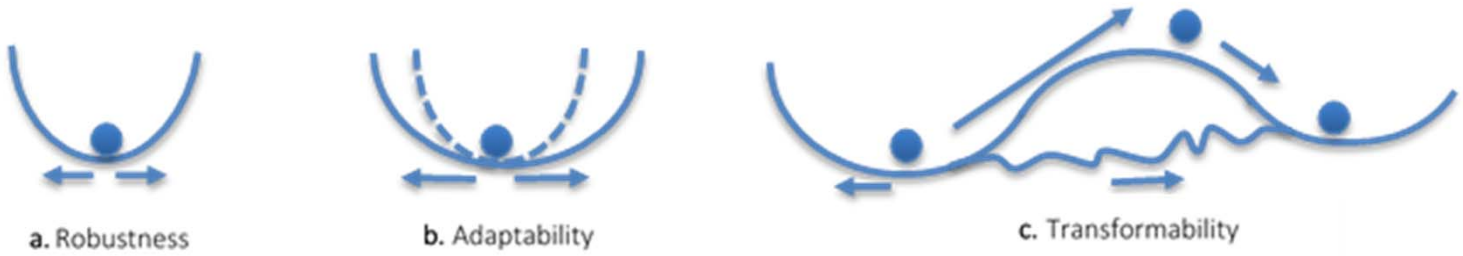
Resilience is more than robustness

Robustness = capacity to withstand challenges

Adaptability = capacity to change the composition of inputs, production, marketing and risk management in response to challenges

Transformability = capacity to significantly change the internal structure and feedback mechanisms in response challenges



[Meuwissen et al. 2019]

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Perceived resilience capacities

Robustness	Adaptability	Transformability
After something challenging has happened, it is easy for my farm to bounce back to its current profitability.	If needed, my farm can adopt new activities, varieties, or technologies in response to challenging situations.	For me, it is easy to make decisions that result in a transformation.
As a farmer, it is hard to manage my farm in such a way that it recovers quickly from shocks.	As a farmer, I can easily adapt myself to challenging situations.	I am in trouble if external circumstances would drastically change, as it is hard to reorganise my farm.
Personally, I find it easy to get back to normal after a setback.	In times of change, I am good at adapting myself and facing up to agricultural challenges.	After facing a challenging period on my farm, I still have the ability to radically reorganise my farm.
A big shock will not heavily affect me, as I have enough options to deal with this shock on my farm.	My farm is not flexible and can hardly be adjusted to deal with a changing environment.	If needed, I can easily make major changes that would transform my farm.

Strongly disagree 1 - 2 - 3 - 4 - 5 - 6 - 7 **Strongly agree**

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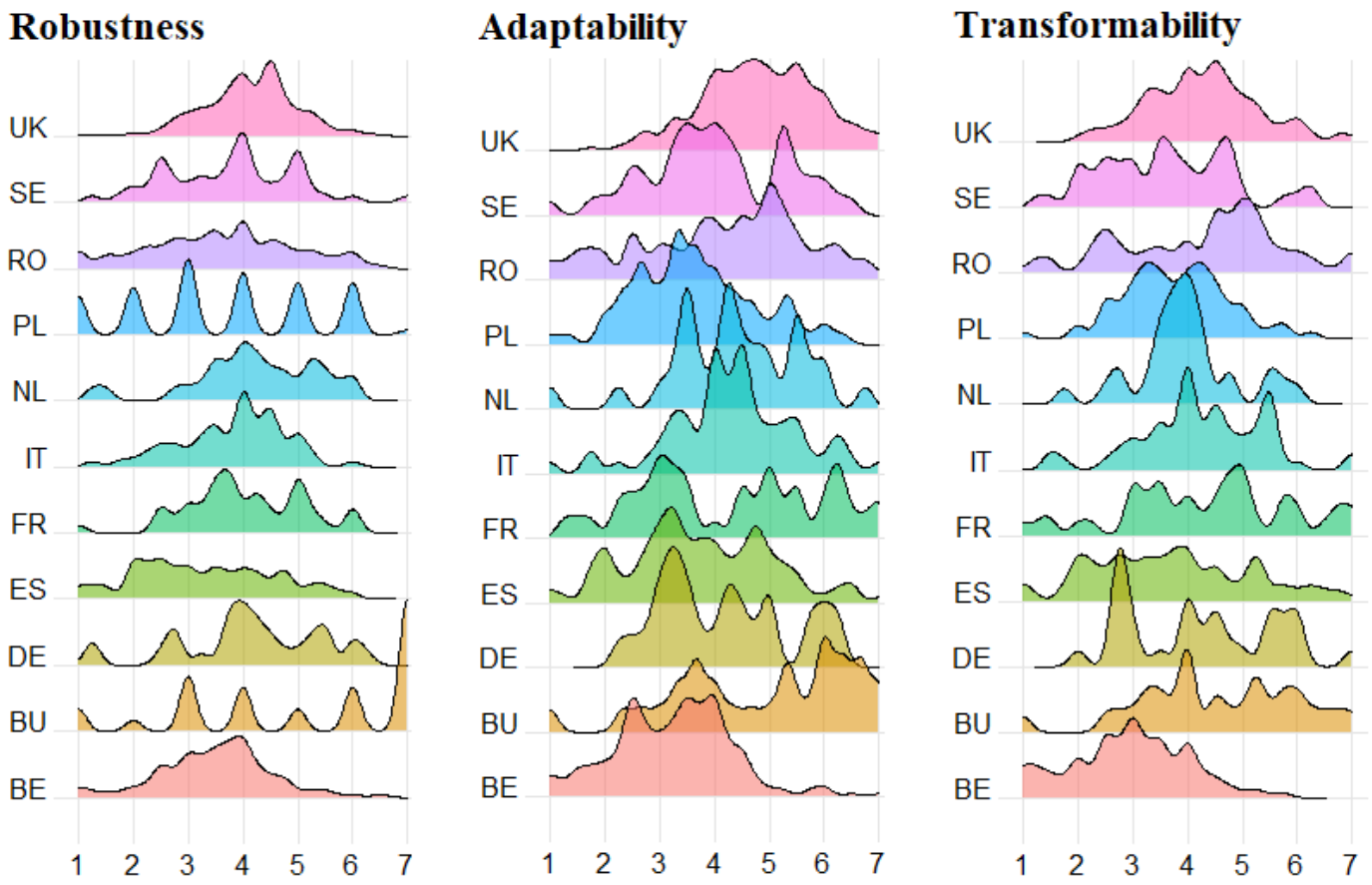
Resilience perception is heterogeneous across and within case study regions



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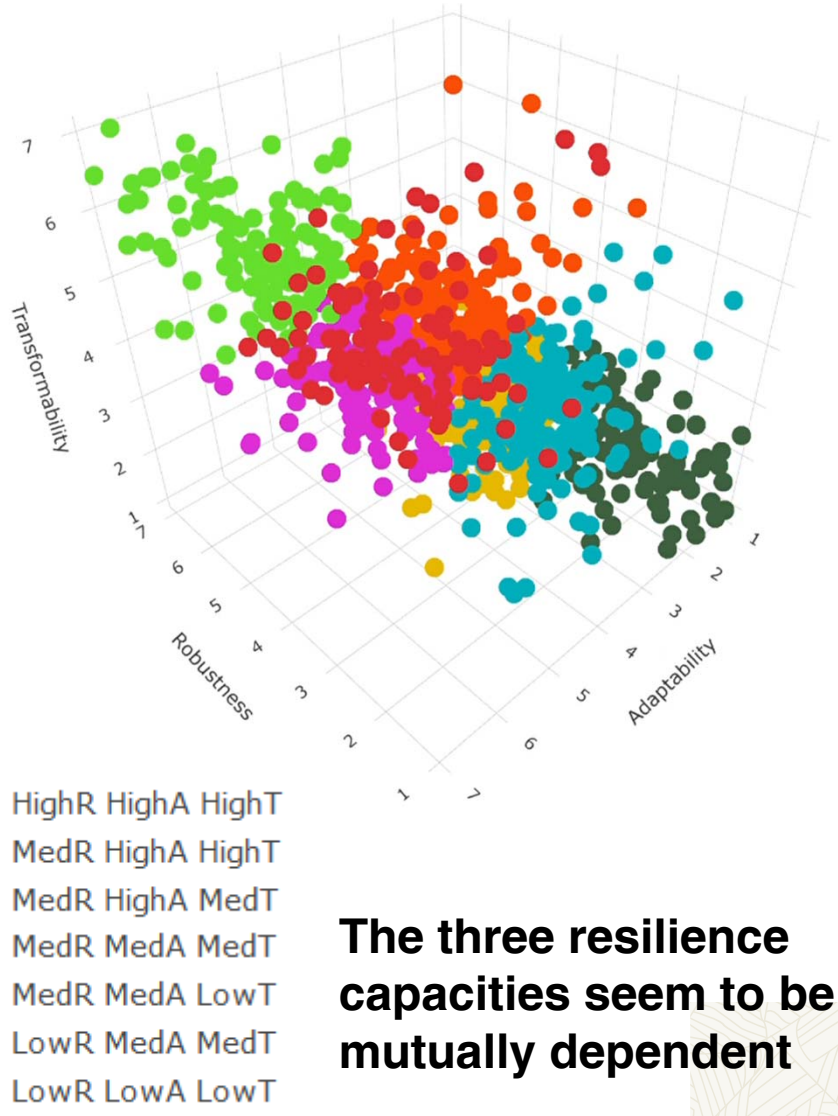
7 clusters were identified



The three resilience capacities seem to be mutually dependent

	Number of observations in the cluster	Means by cluster and resilience capacities		
		Rob	Adap	Trans
HighR HighA HighT	117	5.50	5.81	5.67
MedR HighA HighT	103	3.18	5.38	5.22
MedR HighA MedT	152	4.37	5.04	3.78
MedR MedA MedT	183	4.31	3.74	4.40
MedR MedA LowT	143	4.07	3.22	2.56
LowR MedA MedT	167	2.55	3.47	3.43
LowR LowA LowT	109	2.26	1.95	2.06

Other questions about farm and farmer were included in the survey

Personal farmer's characteristics	Farm settings
Age, gender, education, risk preferences, ability to handle probabilities, etc.	Specialisation, size, share of own land, share of family labour, etc.

1. Resilience *of what*?

2. Resilience *to what*?

Challenges: Environmental, Economic, Social, Institutional

How challenging pre-defined events are for the farm

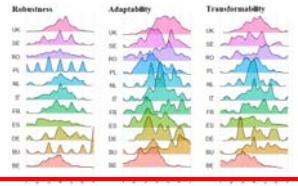
3. Resilience *for what purpose*?

Functions: Private goods, Public goods

Distribute 100 points among eight pre-defined essential functions based on their importance

4. What *resilience capacities?*

Resilience capacities: Robustness, Adaptability, Transformability



Basis for defining clusters

5. *What enhances* resilience?

Resilience attributes: Diversity, Openness, Tightness of feedbacks, System reserves, Modularity

Implemented risk management instruments
Involvement in networks
Openness to innovations

[Meuwissen et al. 2019]

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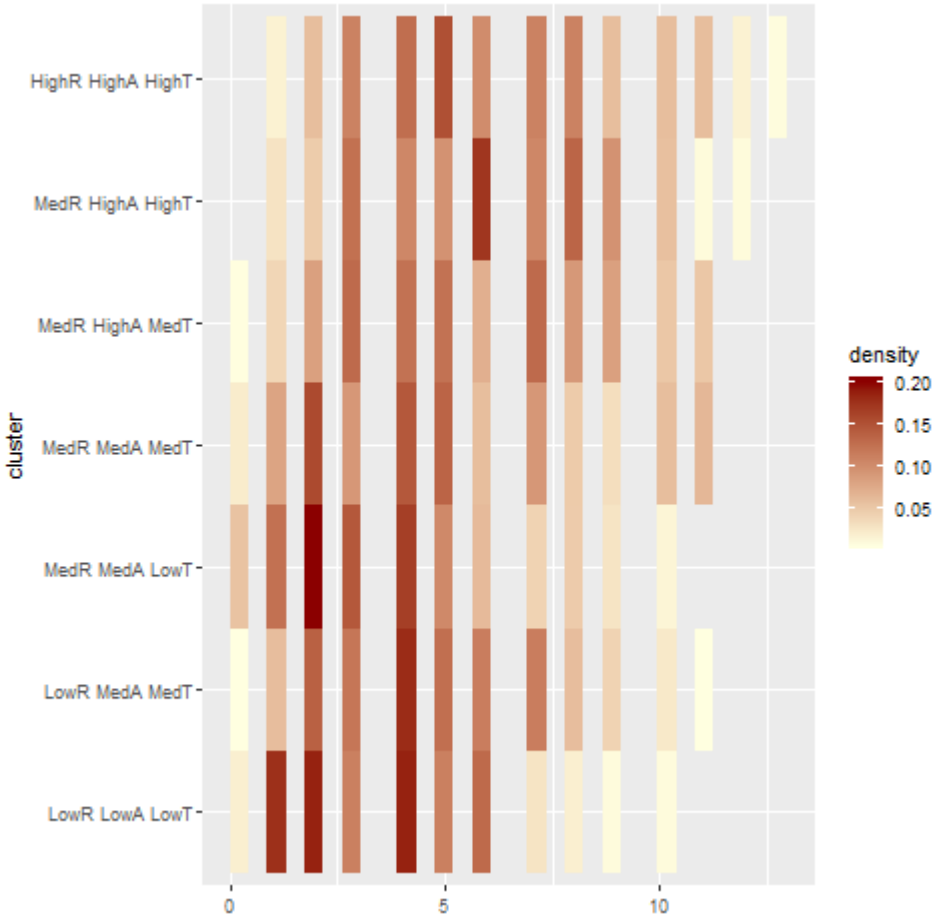
Perceived importance of providing employment and good working conditions for employees as an essential function

	Mean	LowR LowA LowT	LowR MedA MedT	MedR MedA LowT	MedR MedA MedT	MedR HighA MedT	MedR HighA HighT	HighR HighA HighT
LowR LowA LowT	**3.3**							
LowR MedA MedT	**7.2**	0						
MedR MedA LowT	**4.2**	0.35	0					
MedR MedA MedT	**8.4**	0	0.26	0				
MedR HighA MedT	**7.4**	0	0.8	0	0.34			
MedR HighA HighT	**7.4**	0	0.86	0	0.38	0.96		
HighR HighA HighT	**9.8**	0	0.02	0	0.19	0.03	0.05	

Number of implemented on-farm risk management instruments



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Higher perceived resilience capacities are associated with

- Longer farming experience;
- Greater size in acreage;
- Lower share of family labor;
- Higher perceived importance of providing public goods;
- Lower risk aversion;
- Lower downside risk perception;
- Higher number of implemented risk management strategies;
- More active involvement in networks;
- Greater openness to innovations.

Perceived (not revealed) resilience capacities

Causality remains unclear!

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Take-home messages

In contrast to previous research, we target

- Three resilience capacities
- Multiple determinants
- Different farm types and regions

Robustness, adaptability and transformability are mutually dependent and shall be studied together

Our results provide first insights into resilience capacities and their determinants and shall serve as basis for follow-up quantitative analysis

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Coordinated by:

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