Climate change challenges for the European beekeeping sector:

Evidence from a pan-European mixed-methods study on perceived impacts

Civil Dialogue group on beekeeping - 4th March 2026

GHENT UNIVERSITY
DEPARTMENT OF AGRICULTURAL ECONOMICS

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"What used to be normal years in the past, are now exceptionally good years, and what used to be exceptionally bad years, are now normal years." – *Apiary product quality inspector, referring to the evolution of honey yields in Crete, Greece*

"Quand je compare la situation d'aujourd'hui avec celle de l'époque où j'aidais mon père en tant qu'apiculteur, c'est une différence de jour et de nuit."– *Beekeeper, selling apicultural products at the farmers' market Marché Edgar-Quinet in Paris, France*

Why study perceptions?

- Climate impacts on bees has widely been studied biologically
- Much less is known about how the sector experiences these changes
- Adaptation decisions are driven by lived experience

Study design

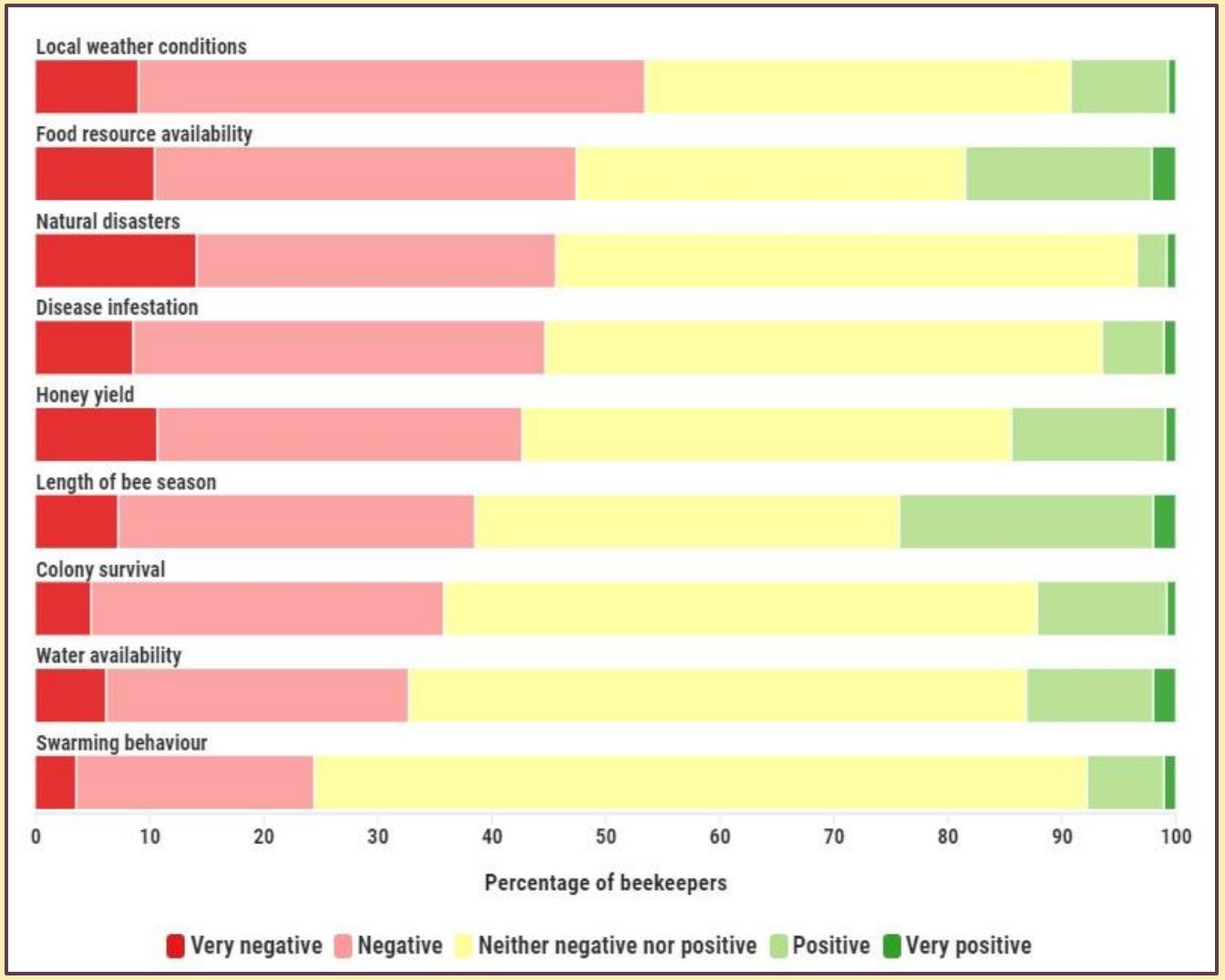
41 stakeholder interviews

Jan - March '20

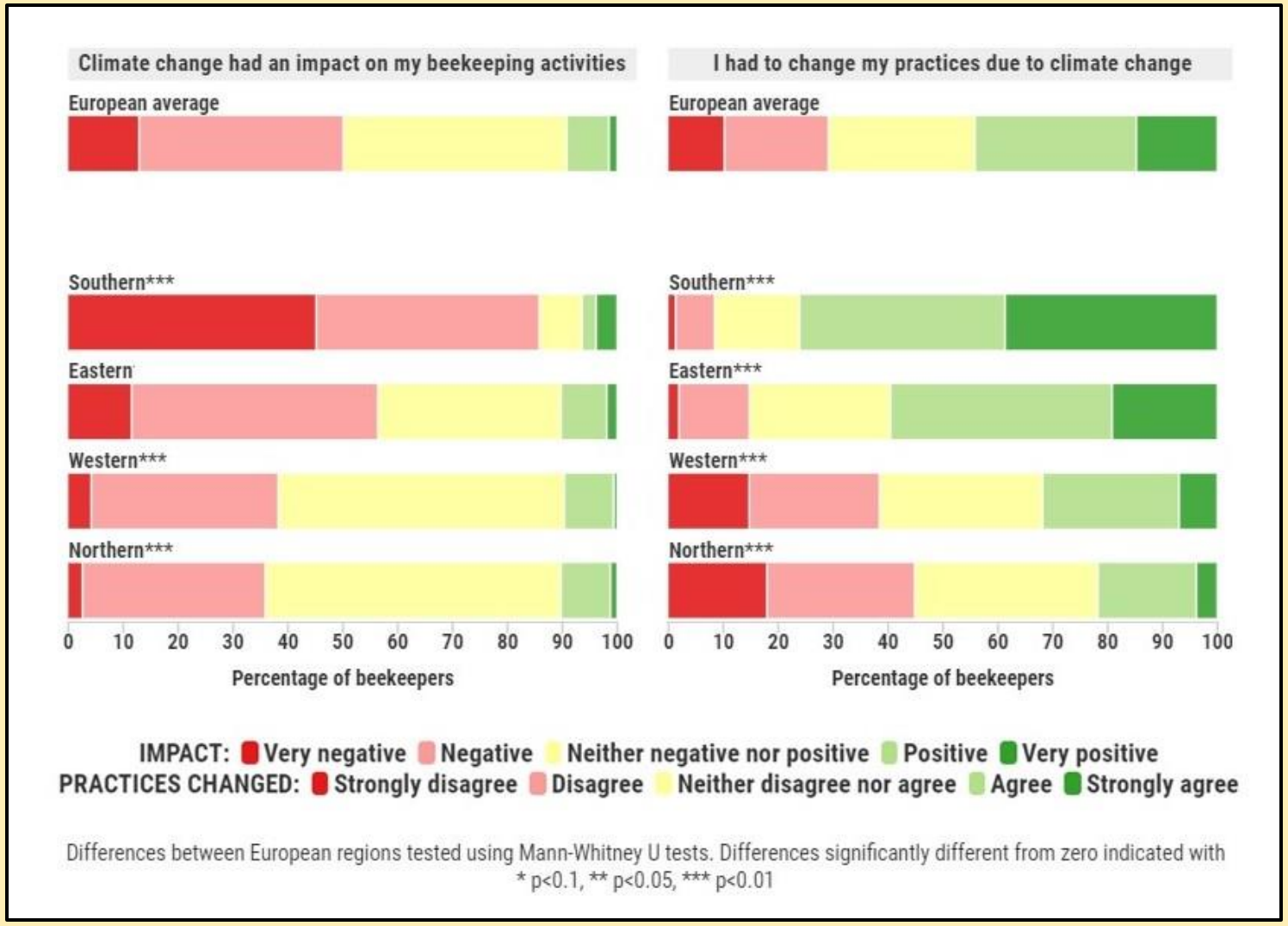
Online survey with 844 beekeepers

Oct '21 - Jan '22

How climate change is perceived to affect beekeeping



Not all regions experience climate change equally



Perceived impacts are associated with performance indicators

'Heavily affected' beekeepers vs. not heavily affected beekeepers

Winter colony loss

25% vs. 20% of beekeepers reporting loss rates of over 20% of their colonies

Honey yield

14.9 kg vs. 18.3 kg per hive on average

Pollination

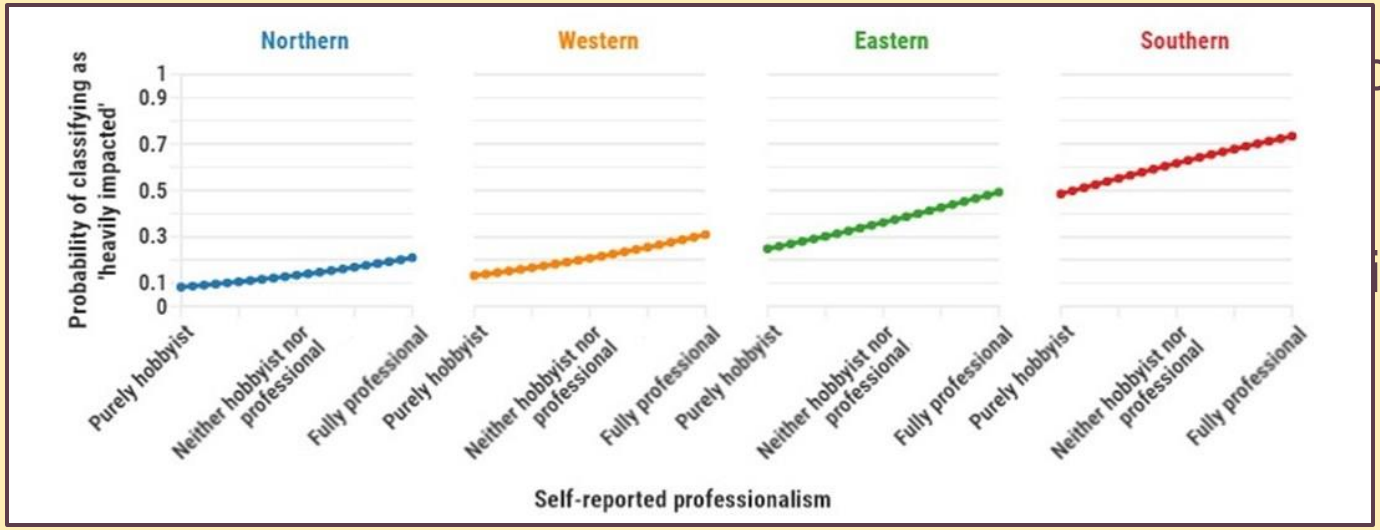
Average self-reported pollination score of 16.3 vs. 14.9 (on a scale of 4-20)

Modelling outcomes
& what they tell us about who feels most impacted

Variables		β	SE	p	OR (95% CI)
EU region	Northern			(base level)	
	Western	0.52	0.38	0.167	1.69 (0.80-3.54)
	Eastern	1.29	0.40	0.001	3.65 (1.68-7.93)
	Southern	2.34	0.40	<0.001	10.4 (4.73-22.7)
Professionalism (based on skills)		0.27	0.07	<0.001	1.31 (1.15-1.49)
Years active in beekeeping		0.02	0.01	0.018	1.02 (1.00-1.03)
Perception of 2021 from economic point of view		-0.21	0.09	0.016	0.81 (0.69-0.96)
Colonies are surrounded by forests		0.29	0.08	<0.001	1.34 (1.15-1.56)
Colonies are surrounded by sufficient floral resources		-0.25	0.09	0.004	0.78 (0.66-0.92)
Policy measures address environmental issues		-0.27	0.09	0.002	0.76 (0.64-0.90)

Higher likelihood of strong impact perceptions among:

- Southern regions
- More professional businesses
- Apiaries in forest environments



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What this brings to today's dialogue

- Climate change is already shaping beekeeper decisions
- Impacts differ strongly across regions and beekeeping types
- Environmental conditions and (local) policy support appear central to resilience

Extended, published version of this paper

Research impact after publication

Climate adaptation & resilience

Sustainability & policy frameworks


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Beekeeping in Europe facing climate change: A mixed methods study on perceived impacts and the need to adapt according to stakeholders and beekeepers

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HIGHLIGHTS

- Climate change (CC) is clearly perceived to be impacting beekeeping in Europe.
- CC impacts are likely to create winners and losers within the beekeeping sector.
- Major CC impacts concern local weather conditions and food resource availability.
- CC impacts are associated with lower honey yield and higher colony winter loss.
- Southern, professional and 'forest' beekeeping boost chance of being impacted by CC.

GRAPHICAL ABSTRACT

Climate - bee health interactions

Precision & digital beekeeping

Global beekeeping perspectives

Let's discuss!

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