Which challenges threaten next 20 years farming? A Partial Least Square model to assess livestock farms resilience under alternative challenging scenarios

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Statement of the Problem: extensive livestock farming systems across EU are undergoing several challenges. Major phenomena driving these threats are climate change, market liberalization, changing consumer habits, and rural depopulation. The increasing complexity of challenges affecting these systems call for advances in understanding what makes farms resilient. However, our comprehension of the extent to which different types of challenges will affect agricultural in future is limited, and quantitative models evaluating the efficacy of resilience capacities to deal with challenges are substantially missing.

The purpose of this study is to define which types of challenges will threaten the resilience of livestock farms the most and which resilience capacities might help cope with those challenges.

Methodology & Theoretical Framework: this research is grounded on the most recent advances of resilience theory in agriculture, including the resilience capacities of robustness, adaptability and transformability, and the conceptualization of social, economic, institutional and environmental challenges in short-term shocks and long-term pressures. The methodology relies on a statistical approach based on 120 surveys of cattle and sheep farmers in Spain. Likert scale metrics were used to elicit farm resilience and future challenges as perceived by farmers. Monte Carlo simulations were applied to simulate alternative, hypothetical challenging scenarios, and a partial least square regression model was developed to assess farm resilience under such scenarios.

Findings: the research shows that sheep farmers perceived lower resilience and higher challenges than cattle farmers. In all cases adaptability and transformability yielded higher values under socio-economic challenges, but lower under environmental and institutional. Besides, these capacities score better under long-term pressures than short-term shocks.

Conclusion & Significance: this research demonstrates that the type of challenges, and its temporal perspective (short- and long-term) matter in farm resilience. The results warn about the potential impact of environmental and institutional challenges in future.
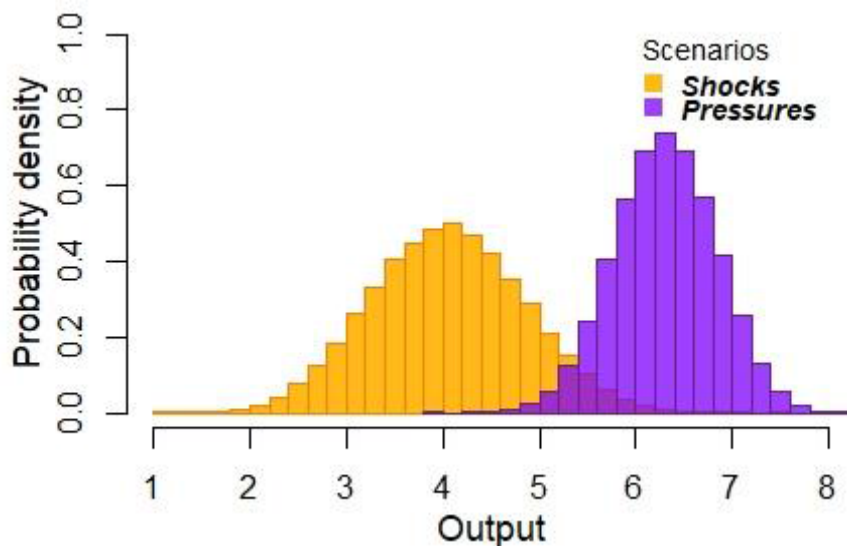
Biography

Bertolozzi-Caredio Daniele has obtained his Bachelor's in Agricultural Science at the University of Florence, Master's in Sustainable Rural Development at the University of Perugia, and a PhD in Agricultural Economics and Policy at the Polytechnic University of Madrid. He served as pre-doctoral researcher for the H2020 SURE-Farm project. Currently, he serves as researcher and policy consultant at Ecorys – Brussels.