

Extended Abstract

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Paper/Poster Title	How farmers perceive monetary and non-monetary costs of their biodiversity measures
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Abstract prepared for presentation at the 98th Annual Conference of The Agricultural Economics Society will be held at The University of Edinburgh, UK, 18th - 20th March 2024.

Abstract	200 words max
<p>Aiming to inform policy-making, this study's objective is to gain a more holistic understanding of both monetary and non-monetary costs European farmers perceive when implementing biodiversity measures as part of voluntary agri-environmental programs. Accounting for the potential diversity of viewpoints, Q methodology was applied. In case studies located in Estonia, the Netherlands, Romania and the United Kingdom, 36 farmers ranked 41 statements on diverse <i>financial, management-related, psychological/emotional</i> and <i>social costs</i>. Based on Principal Component Analysis and Varimax Rotation, farmers with similar perceptions were grouped into five "factors", explaining 50 % of the total variance. All factors are dominated by at least two cost types. Accordingly, preliminary results clearly show that perceived costs comprise, but are not restricted to the financial dimension. Besides providing adequate compensation payments, adjustments in the design of agri-environmental programs might therefore be promising to reduce perceived costs.</p>	
Keywords	biodiversity, farmer, agriculture, perceptions, monetary costs, non-monetary costs, Q methodology, mixed methods
JEL Code	Q18: Agricultural Policy; Food Policy; Animal Welfare Policy
Introduction	100 – 250 words
<p>In the European Union, numerous voluntary agri-environmental programs aim to incentivize farmers' implementation of biodiversity measures. Commonly, these programs provide payments to compensate monetary costs resulting from biodiversity measures, such as loss in yields or increased expenses (e.g. eco-schemes, Rossi, 2023). Yet, research increasingly draws attention to <i>non-monetary</i> costs which farmers perceive within their agri-environmental programs. This, for example, comprises the perceived administrative burden coming with psychological costs (e.g. Mack et al., 2020, Ritzel et al., 2020) or negative impacts on cultural capital (e.g. Burton et al., 2008; Burton and Paragahawewa, 2011). Given that farmers' long-term engagement with agri-environmental programs contributes to their environmental effectiveness (e.g. Defrancesco et al., 2018), it is essential to gain a more holistic understanding of the multi-faceted, both monetary and non-monetary costs which farmers perceive therein and which might negatively affect their willingness to maintain, or further expand their biodiversity measures.</p> <p>However, perceived costs of biodiversity measures are supposedly highly diverse, given that program specificities and farming systems, as well as the „group“ of farmers itself, are heterogeneous both <i>across</i> and <i>within</i> European regions (Bartkowski et al., 2022). Therefore, not only the multiple dimensions of perceived costs need to be assessed, but also the plurality</p>	

of viewpoints which farmers hold about these costs. To this end, this study is a multi-national application of Q methodology, allowing to reliably and scientifically capture subjective viewpoints in an experimental setting (Watts and Stenner, 2012).

Methodology

100 – 250
words

In this study, participants, i.e. farmers, were asked to sort the „Q set“, a set of statements on monetary and non-monetary costs of biodiversity measures, on a scale from „most disagree“ (-4) to „most agree“ (+4) in a forced, quasi-normal distribution. The definition of the Q set was based on multiple steps to ensure that it is “broadly representative of the opinion domain at issue” (Watts and Stenner, 2005: 75): First, literature was reviewed to identify perceived drawbacks of pro-environmental action, which we then clustered into four overall “cost” types (*financial*, *management-related*, *psychological-emotional* and *social*) and worded as short statements. Second, interviews with eight experts (advisors, agro-economists, farmer interest groups) were conducted to validate/complement these statements in terms of understandability, practical and local relevance. Based on the experts’ interviews, the conceptualizing authors made the final selection of statements and adjusted their wording to reduce ambiguity and redundancy. The final Q set comprised 41 statements. To illustrate: “*The biodiversity measure is restricting the flexibility on my farm.*” was included as one statement for *management-related costs*.

As part of in-person interviews, farmers in four European study areas sorted this Q set on the above-described scale. After having completed the sorting, farmers were asked additional follow-up questions to explain why they agreed with certain statements more than with others.

Study areas were located in Estonia, the Netherlands, Romania, respectively the United Kingdom. They are each characterized by specific biodiversity measures, i.e. maintenance of coastal meadows, grassland extensification and cover crops.

Results

100 – 250
words

Across study areas, 36 valid Q sorts and qualitative data from post-sorting interviews were collected. For quantitatively analyzing the Q sorts, the software KADE (Banasick, 2019) was used. To identify the so-called „factors“, i.e. groups of farmers with similar sorts/viewpoints (Watts and Stenner, 2012), Principal Component Analysis with subsequent Varimax rotation was run. Based on discussions among the conceptualizing co-authors, we opted for a 5-factor-solution allowing for a meaningful interpretation (Braitto et al., 2020) while still capturing a potentially high diversity of viewpoints. With 50% of explained variance and factor eigenvalues ranging from 13 to 6, this solution is deemed suitable also from a statistical perspective (Watts and Stenner, 2012).

At the time being, results show that *financial costs* which directly affect farmers’ income, reflected in statements on insufficient funding or unsatisfying market prices for biodiversity-friendly products, tended to be ranked relatively high across most identified factors. Additionally, all factors included relatively high rankings of varying *psychological/emotional costs*, comprising statements on the own knowledge being undervalued or feeling too much surveillance, as well as *management-related costs*, comprising statements on the measure’s bad fit to local soil or climate or loss of flexibility. Only one factor is characterized by

relatively high rankings of several *social costs*, as reflected in statements on farmers no longer being perceived as „good“ farmers or appreciated business partners. At the same time, farmers gathered in this factor ranked financial costs relatively low.

Discussion and Conclusion

100 – 250
words

Preliminary findings emphasize that perceived costs comprise, but are not restricted to the monetary dimension. Besides remunerating biodiversity measures with adequate funding, adjusting the design of agri-environmental programs could help to reduce perceived *psychological/emotional* and *management-related costs*. For example, setting up biodiversity awards (e.g. Fleury et al., 2015) could help to account for farmers who feel that their efforts are not sufficiently appreciated by the public. Result-based compensation (for a summary see, e.g., Elmiger et al., 2023) and local or yearly fine-tuning of requirements, as implemented in the Estonian study area (*expert EE-1*) might increase flexibility on the farm and improve the measure's perceived local fit. Against expectations based on literature (e.g.: Burton et al., 2008; Burton and Paragahawewa, 2011), *social costs* comprising cultural aspects were widely ranked lower than other cost types, suggesting a change in opinions among the farming community with biodiversity-friendly management being increasingly implemented and, additionally, demanded by society.

To allow for conclusions targeted at specific groups of farmers, further analysis will focus on the farmers gathered in each factor. Additionally, post-sorting questions will be analyzed qualitatively to facilitate a comprehensive understanding of the outlined trends and allow an informed formulation of policy recommendations.

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