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The role of social and personal norms in biodiversity conservation: A segmentation of Swiss farmers

Christian Ritzel, Antonia Kaiser, Yanbing Wang & Gabriele Mack

53th Annual conference of the Swiss Society for Agricultural Economics and Agricultural Sociology (SGA)

Motivation

- Agriculture plays a major role in anthropogenic biodiversity loss (Jaureguiberry et al., 2022; Diop et al., 2024)
- Biodiversity conservation is a public good (Perrings and Gadgil, 2003; Baumgärtner, 2007) → agricultural policies provide monetary incentives (Huber et al., 2024)
- Ecological focus areas (EFAs) are a cornerstone promoting biodiversity conservation (Jan et al., 2024; Zimmert et al., 2024)

Aim of the study

- The interplay between social norms and the personal norm is crucial in predicting pro-environmental behavior (Johansson et al., 2013; Wauters et al., 2017)

- Empirical studies that consider norms as predictors of EFA implementation typically use econometric techniques, which estimate the average effect of the total population (Menozzi et al., 2015; Beer and Theuvsen, 2018; Otter and Beer, 2021)

- Social and personal norms among farmers can be heterogeneous →

    1. Segment Swiss farmers according to their social and personal norms regarding on-farm biodiversity conservation

    2. Analyze whether these segments differ in terms of implementing EFAs

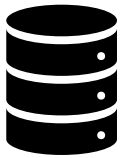
Theoretical background

- **Social norms**
  - Injunctive norms: Perceptions of an individual regarding what relevant peers approve or think the individual should do (White et al., 2011)
  - Descriptive norms: Perceptions of peers' engagement in a common behavior (Heinicke et al., 2022)

- **Personal norms**
  - Self-defined moral standards of one's own behavior regarding doing ‘the right thing’ (Schwartz and Howard, 1981; Perugini et al., 2003)

Databases

Data from a survey of Swiss farmers
(*N* = 882) conducted in 2023



Data on registered EFAs from the
Swiss Agricultural Information System

Variables and measures

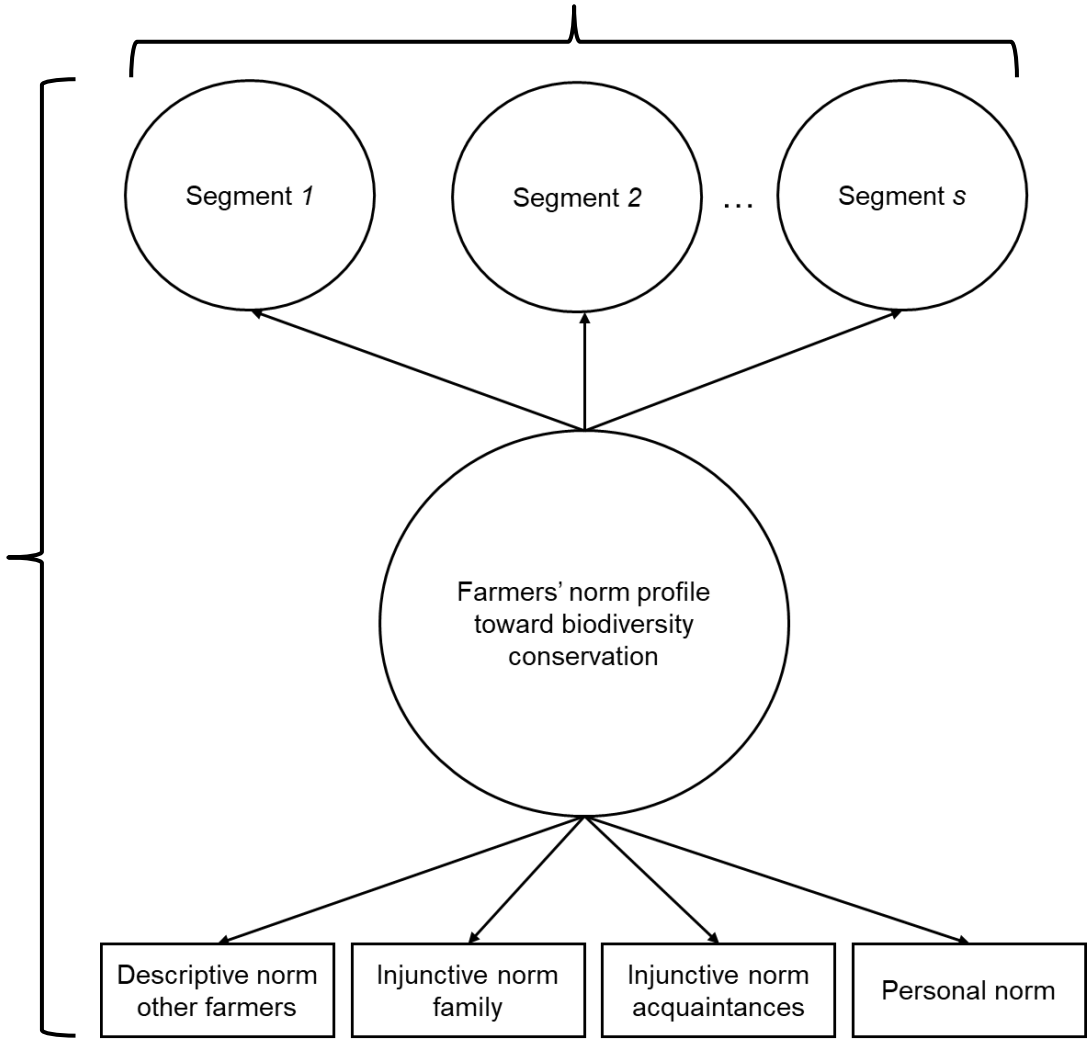
- **Social and personal norms** (Cialdini et al., 1990)
  - Descriptive norm – other farmers, injuncitve norm – family, injunctive norm – acquaintances, personal norm (Likert scale 1 = strongly disagree to 7 = strongly agree)

- **EFA share** (Mack et al., 2020)
  - Share 1 = (∑ Action-oriented EFAs / Utilized Agricultural Area) × 100
  - Share 2 = (∑ Result-oriented EFAs / ∑ Action-oriented EFAs) × 100
  - Share 3 = (∑ Agglomeration EFAs / ∑ Action-oriented EFAs) × 100

Methods

2. Mean value differences between segments
analysis of variance and covariance

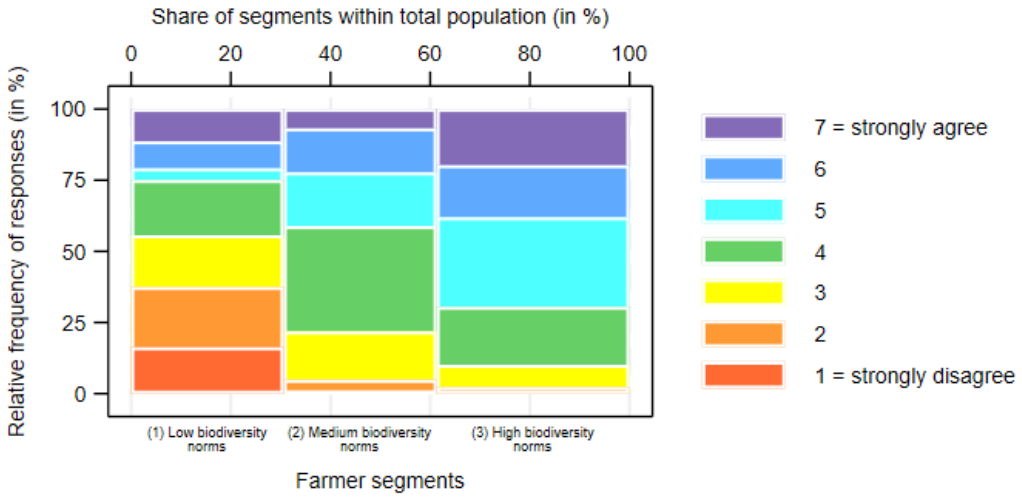
1. Segmenting farmers
latent class analysis



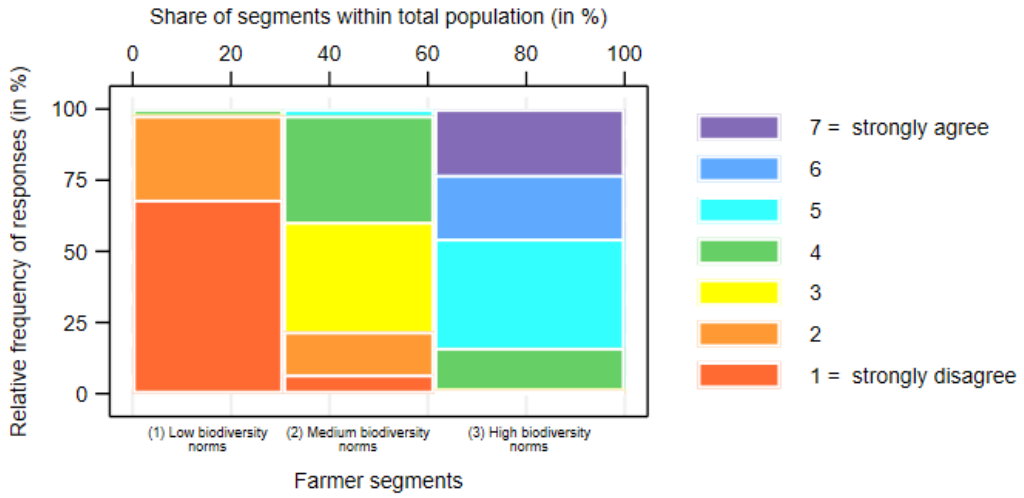
(Naldi and Cazzaniga, 2020)

Results: Latent class analysis

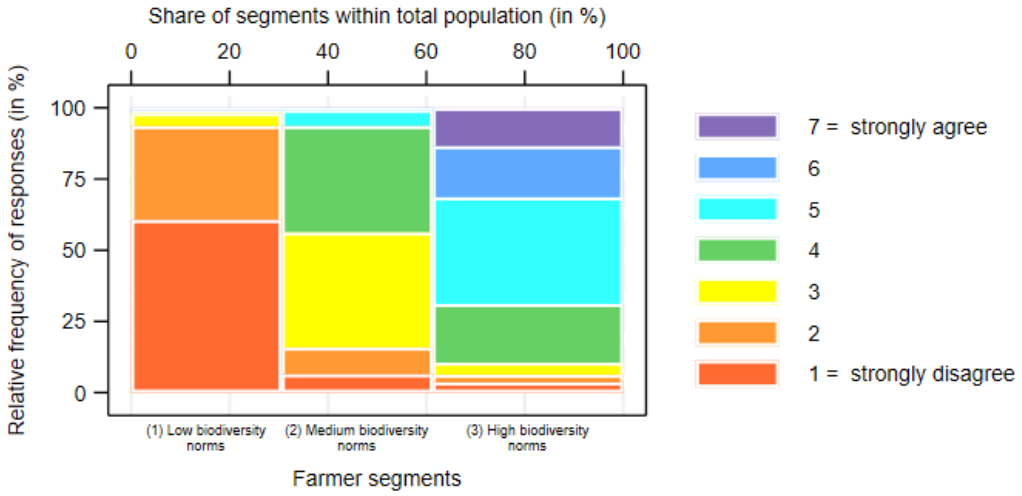
a) Descriptive norm



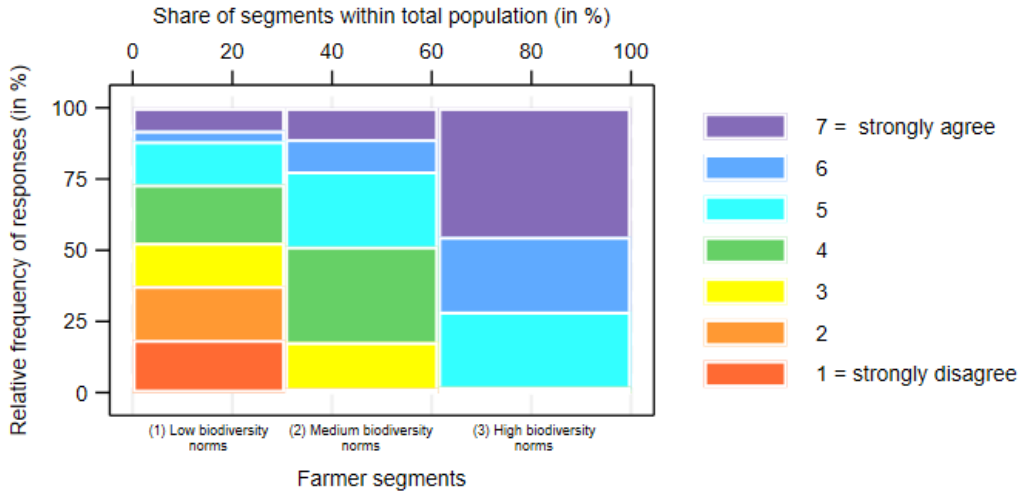
b) Injunctive norm – family



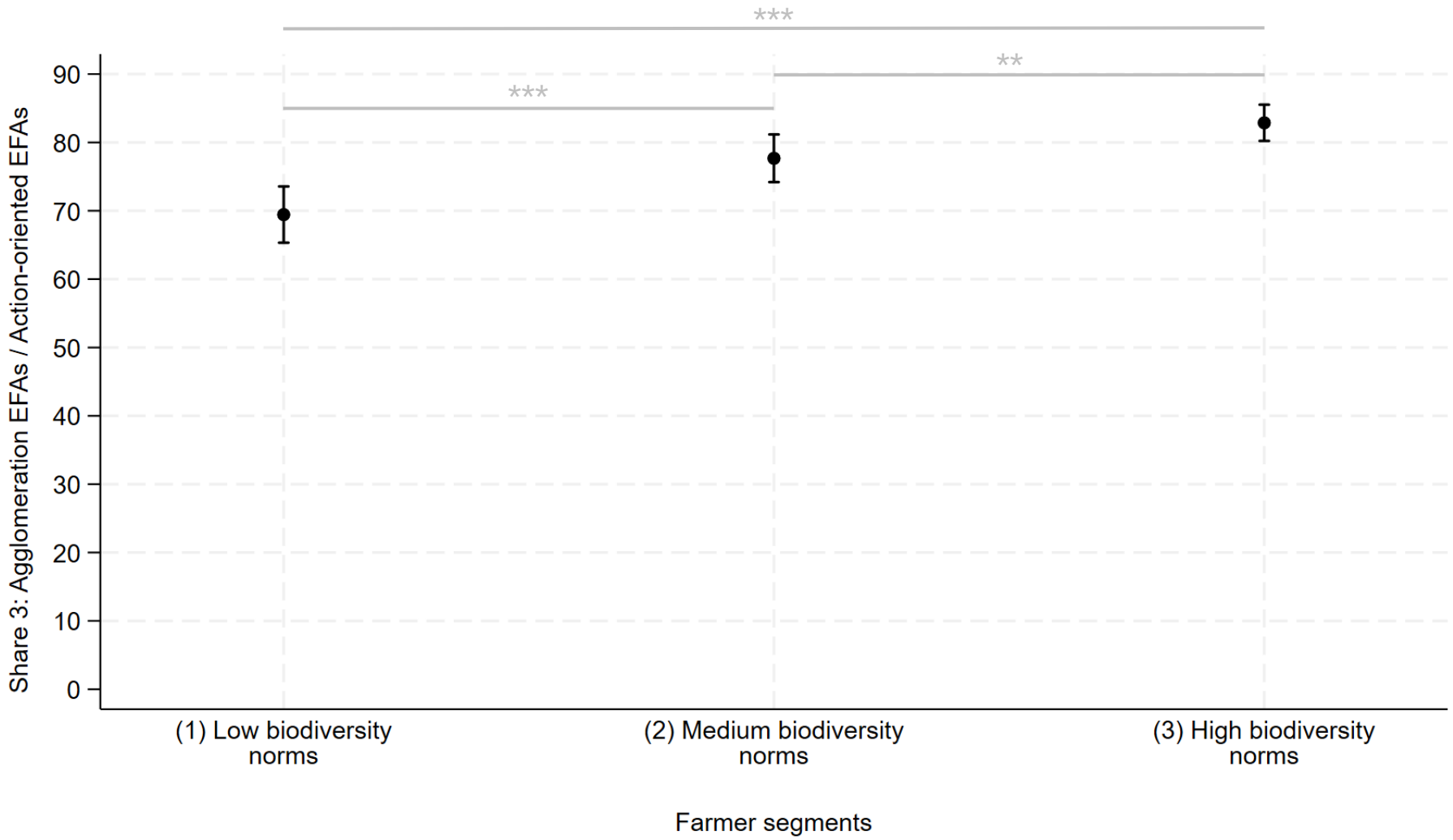
c) Injunctive norm – acquaintances



d) Personal norm

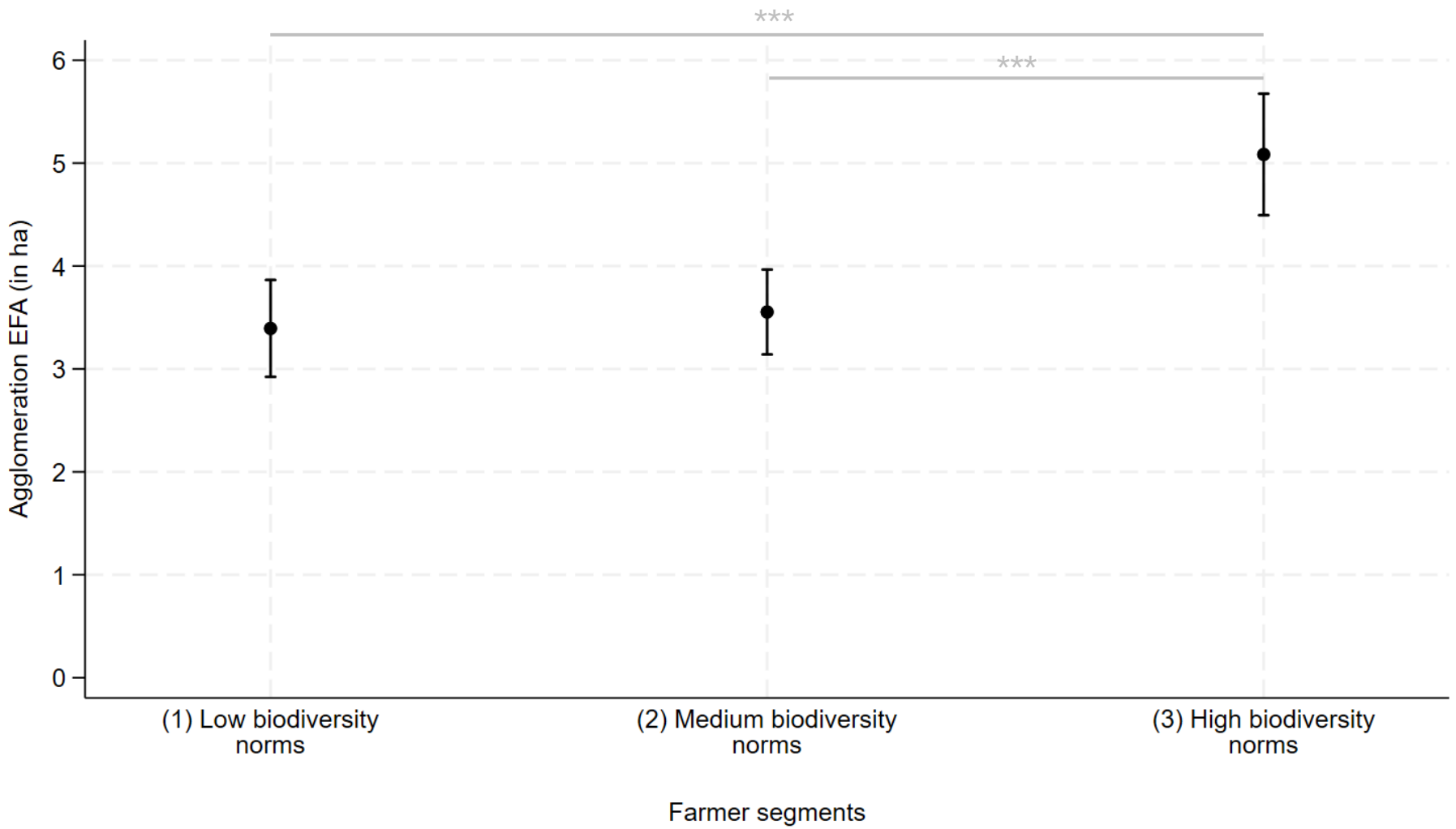


Results: Analysis of variance and covariance



***, ** and * denote significance at 1%, 5% and 10% respectively.

Results: Analysis of variance and covariance



***, ** and * denote significance at 1%, 5% and 10% respectively.

Conclusion

- Farmers with higher social and personal norms implemented larger EFAs than farmers with lower biodiversity norms
- Policymakers should focus on activating social norms through interventions among farmers with low biodiversity conservation efforts
- Potential interventions
  - Provision of information to farmers about the quantity and quality of EFAs implemented by other farmers
  - Provision of information about the extent to which society approves the implementation of EFAs
- The activation of social norms through interventions can, in turn, positively influence farmers' personal norms toward biodiversity conservation

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Research article

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ABSTRACT

The agricultural sector is a major contributor to global biodiversity loss. Ecological focus areas (EFAs), such as extensively used meadows, hedges, and buffer strips, are a cornerstone in promoting biodiversity conservation. Previous research highlights social and personal norms as strong predictors of farmers' efforts to conserve biodiversity. Accordingly, we aim to segment Swiss farmers according to their social and personal norms and analyze how these segments differ in terms of pro-environmental behavior. Furthermore, we are interested in whether these segments differ in terms of farmer's self-efficacy, the importance of farm sales and biodiversity payments, farmers' political priorities, and socio-demographic and farm characteristics. For the empirical analyses, we used a unique dataset combining data from a survey of Swiss farmers ($N = 882$) with data on registered EFAs from the Swiss Agricultural Information System. We explored the segments based on responses to four items capturing social and personal norms toward biodiversity conservation using latent class analysis. To estimate the mean differences between segments, we used an analysis of variance and covariance. Our results showed that farmer segments with high social and personal norms implemented more EFAs than those with lower social and personal norms. Moreover, high social and personal norms were associated with enhanced self-efficacy, higher importance of biodiversity payments for farm income, stronger priority for environmental policies, and less intensive agricultural production practices. This study informs policymakers in designing social norm interventions that, for example, include information about society's approval of farmers' biodiversity conservation efforts.
















Thank you for your attention

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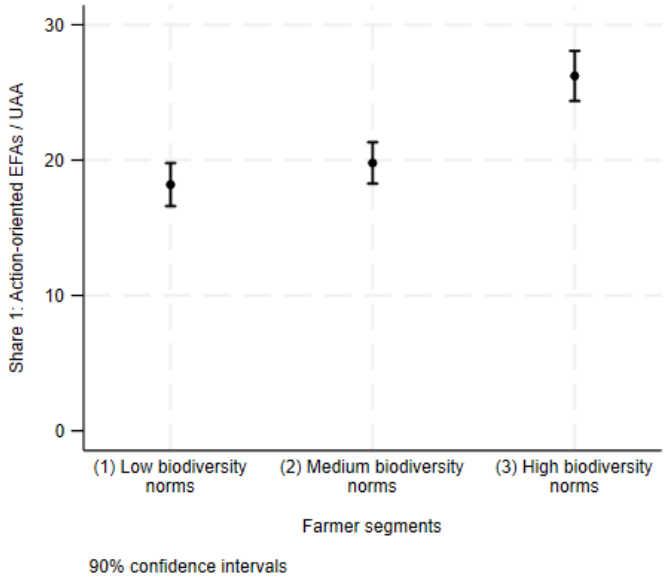
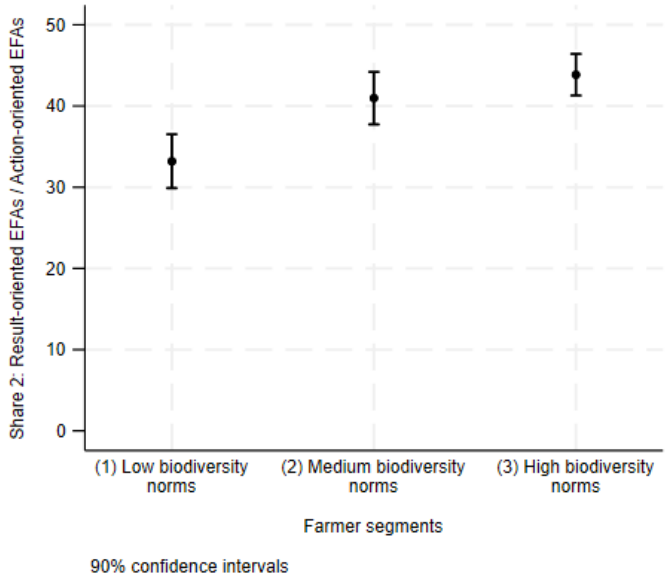
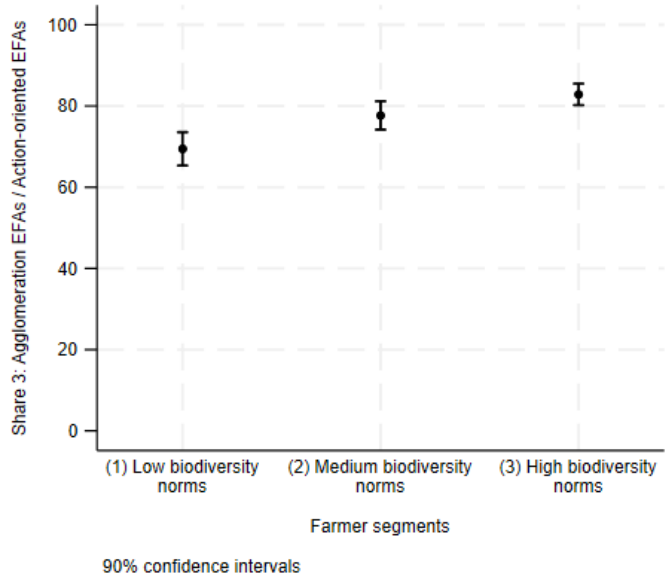
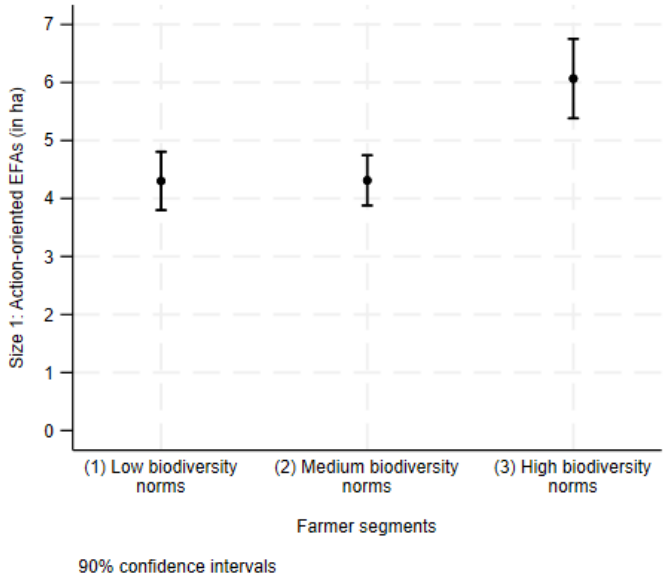
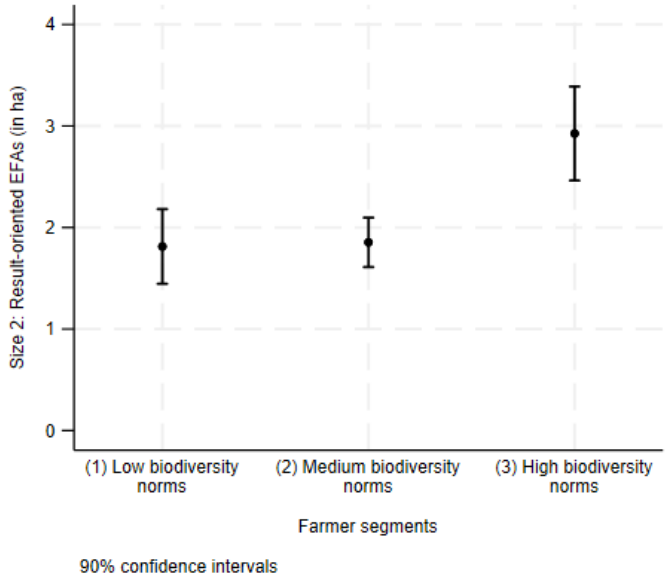
Results: Analysis of variance and covariance

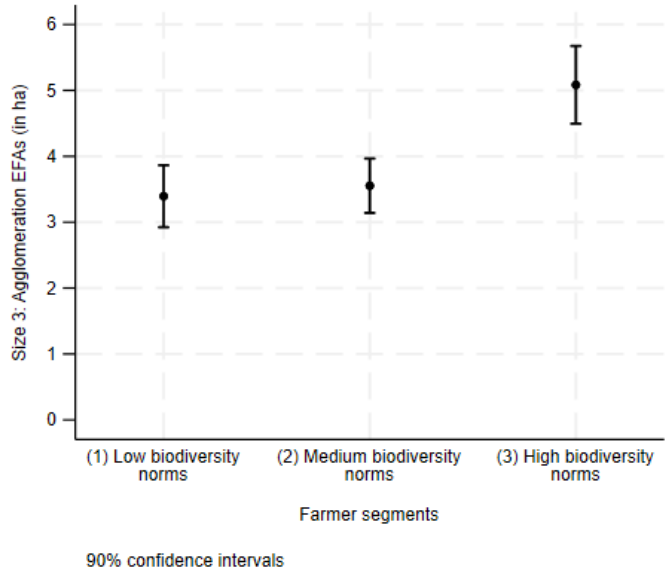












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Results: Analysis of variance and covariance

Variable	Mean difference low norms – medium norms	Mean difference low norms – high norms	Mean difference medium norms – high norms
Self-efficacy			
Personal skills biodiversity conservation	−0.2	−0.9***	−0.7***
Damage prevention biodiversity	−0.2	−0.7***	−0.5***
Find solutions for difficulties biodiversity conservation	−0.1	−0.7***	−0.6***
Importance of farm income sources			
Farm sales	+0.2	+0.1	−0.1
Biodiversity payments	−0.7***	−1.4***	−0.7***

***, ** and * denote significance at 1%, 5% and 10% respectively.

Results: Analysis of variance and covariance

Variable	Mean difference low norms – medium norms	Mean difference low norms – high norms	Mean difference medium norms – high norms
Policy priority			
Promote biodiversity	−0.9***	−1.7***	−0.8***
Promote animal welfare	−0.4**	−0.7***	−0.3***
Reduce consumer prices	−0.3**	−0.3*	0.0
Ensure appropriate farm income	0.0	0.0	0.0
Increase domestic food production	+0.1**	+0.5***	+0.4***
Reduce greenhouse gas emissions	−0.7***	−1.3***	−0.6***
Reduce nutrient surplus	−0.6***	−1.2***	−0.6***
Reduce pesticide application	−0.8***	−1.2***	−0.5***

***, ** and * denote significance at 1%, 5% and 10% respectively.

Results: Analysis of variance and covariance

Variable	Mean difference low norms – medium norms	Mean difference low norms – high norms	Mean difference medium norms – high norms
Socio-demographic characteristics			
Share males	−2.7	+0.9	+3.6
Age farm manager	0.0	+0.2	+0.2
Share full-time farms	+4.6	+4.0	−0.6
Share farms German-speaking region	+3.0	+3.0	0.0

***, ** and * denote significance at 1%, 5% and 10% respectively.

Results: Analysis of variance and covariance

Variable	Mean difference low norms – medium norms	Mean difference low norms – high norms	Mean difference medium norms – high norms
Education			
Share practical experience	-0.4	+0.2	+0.6
Share apprenticeship	+0.4	+0.1	-0.3
Share federal vocational certificate	-1.1	+1.0	+2.1
Share federal certificate of competence	-1.8	+2.2	+4.3
Share professional experience	+5.1*	+5.0	0.0
Share master's examination	-2.4	-4.6	-2.1
Share higher college	0.0	-2.6*	-2.6*
Share university	-1.8	-3.6**	-1.8
Share other	+2.0	+1.9	-0.1

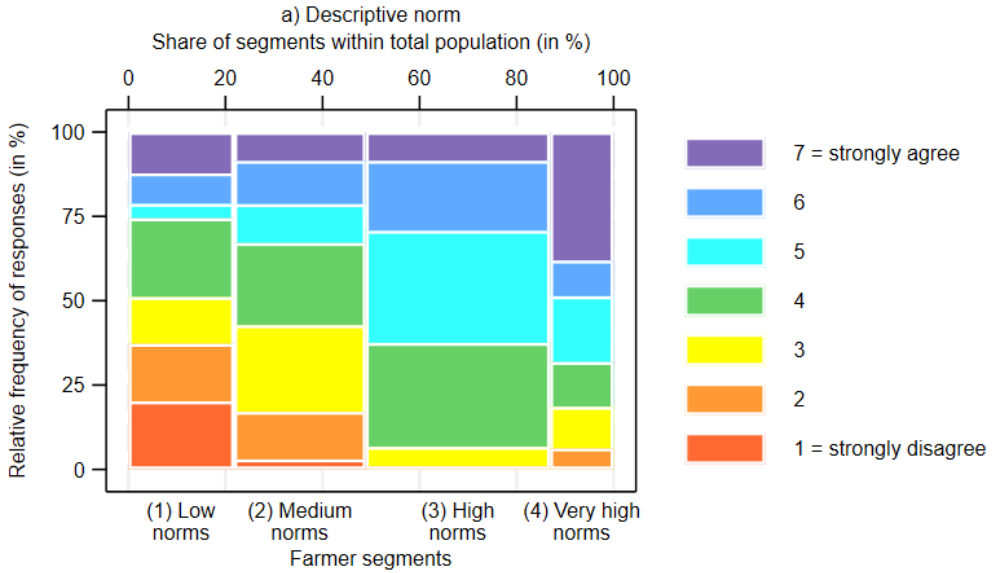
***, ** and * denote significance at 1%, 5% and 10% respectively.

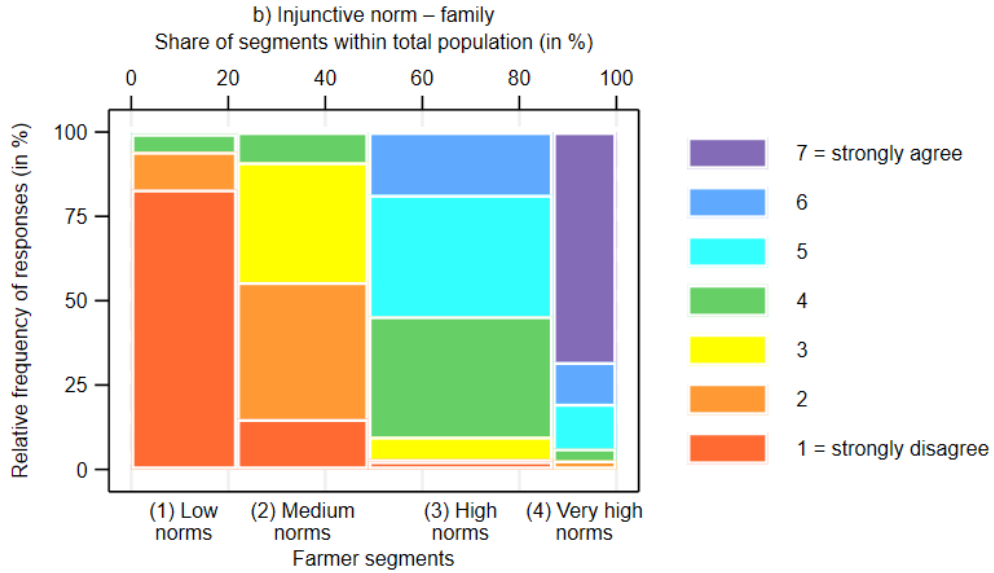
Results: Analysis of variance and covariance

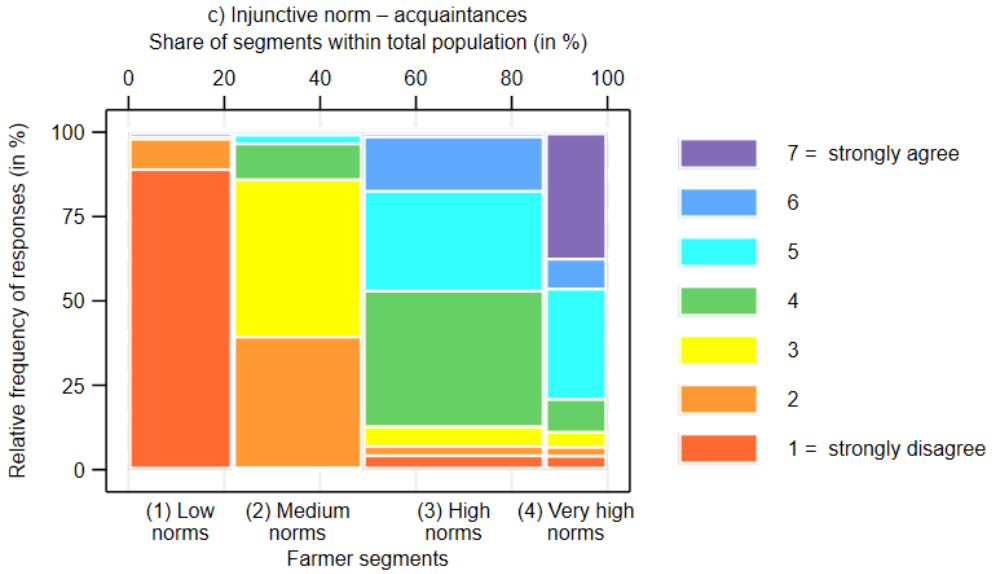
Variable	Mean difference low norms – medium norms	Mean difference low norms – high norms	Mean difference medium norms – high norms
Farm characteristics			
UAA	+1.7	+0.4	−1.3
Livestock units per hectare	+0.1	+0.3***	+0.2***
Share organic farms	−3.3	−14.9***	−11.6***
Agricultural zone			
Share farms in valley zone	+0.7	+1.4	+0.7
Share farms in hill zone	+0.9	+1.8	+0.9
Share farms in mountain zone I	−1.4	−1.2	+0.2
Share farms in mountain zone II	+3.5	+4.0	+0.5
Share farms in mountain zone III	−2.6	−1.9	+0.7
Share farms in mountain zone IV	-1.1	-4.1***	-3.0*

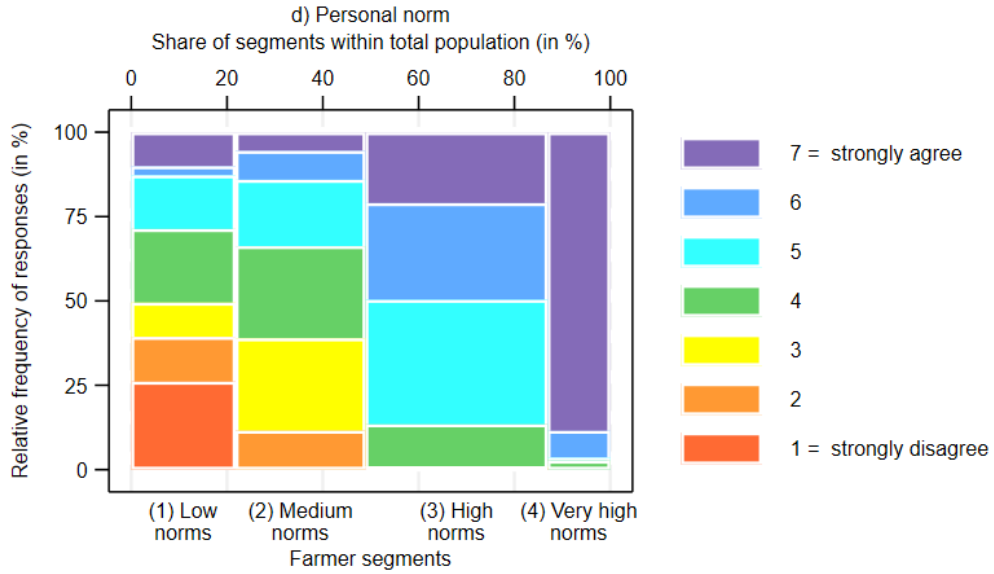
***, ** and * denote significance at 1%, 5% and 10% respectively.

Results: Latent class analysis

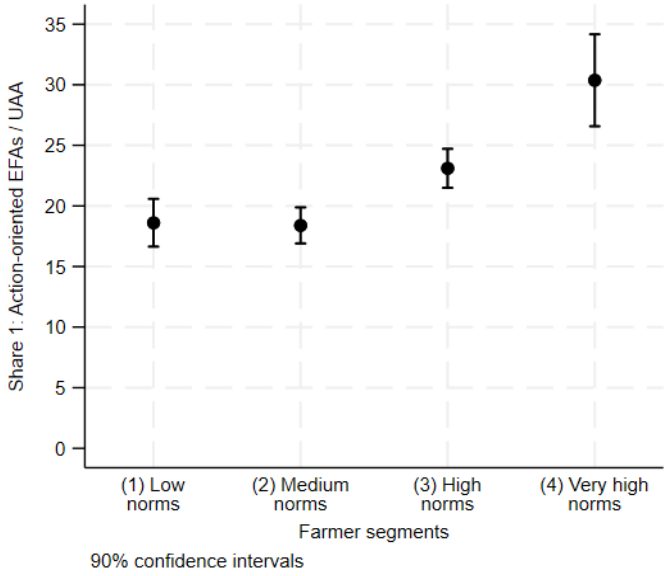


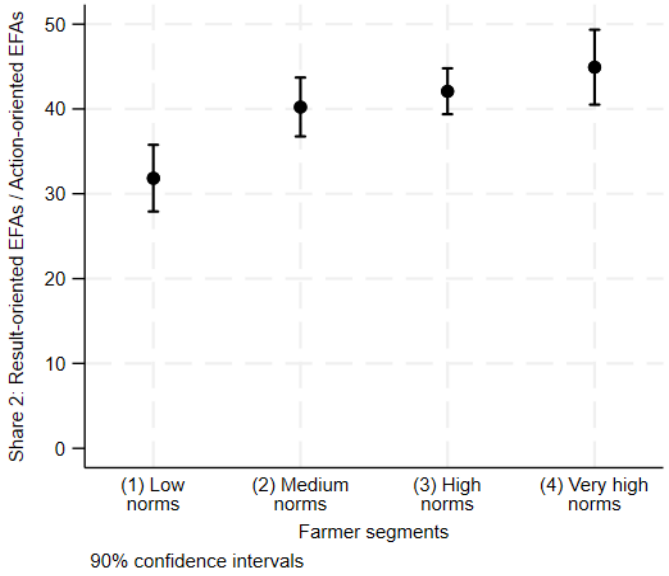


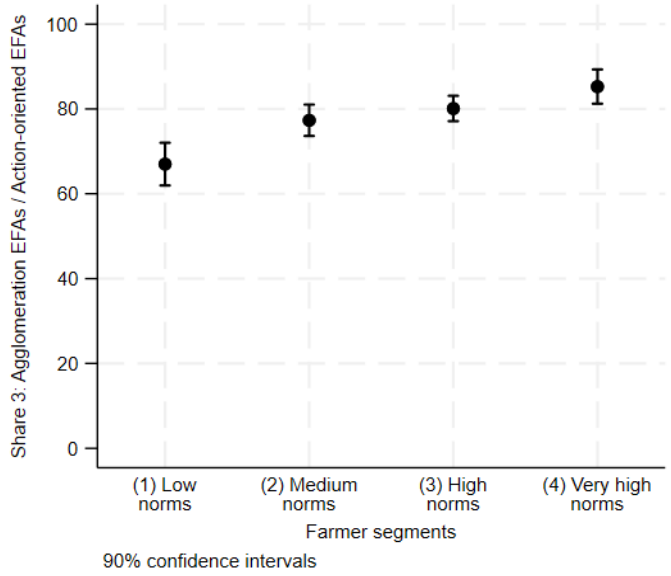


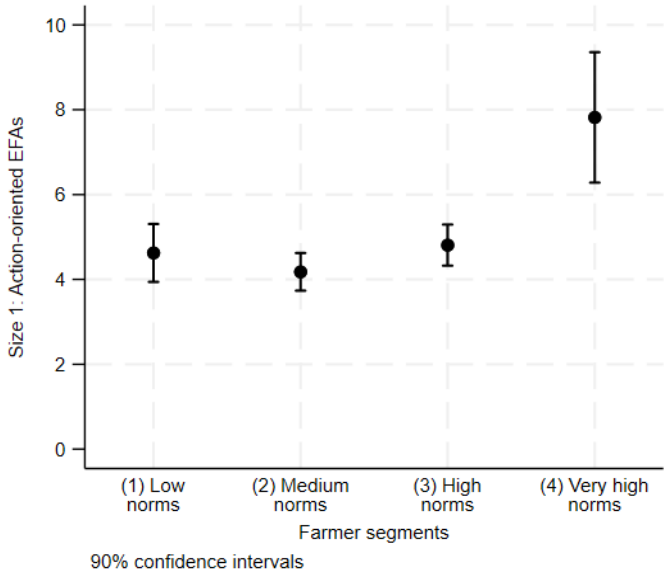


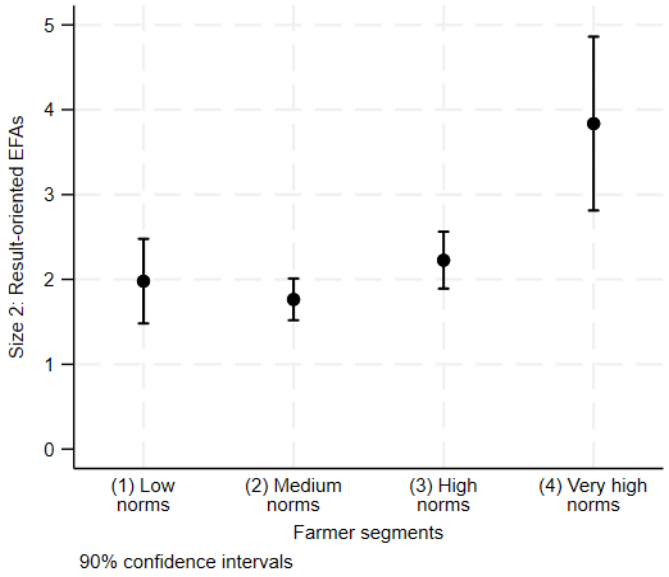
Results: Analysis of variance and covariance

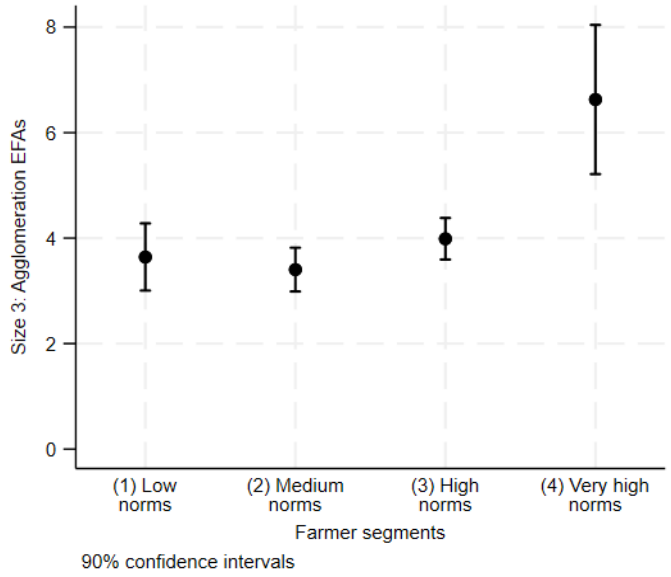












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