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ORIGINAL ARTICLE OPEN ACCESS

# Private or Public? Farmer Preferences and Identities in Agri-Environmental Contract Implementation

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## ABSTRACT

This study investigates farmer preferences for publicly and privately financed agri-environmental contracts. Using a labelled Discrete Choice Experiment with 366 German grassland farmers, we examine trade-offs between payment schemes (public/private), payment criteria (practice-based/result-based), collaboration options, and advisory services. Our results show that farmers require higher compensation for privately financed contracts compared to public ones. On average, respondents prefer practice-based over result-based payments and value free advisory services, particularly in private schemes. Preferences for collaborative implementation indicate a strong desire for autonomy. A key contribution of this study lies in integrating farmer identity into the analysis. Drawing on a psychometric scale of 'good farmer' attributes, we identify three latent identities—productivist, environmentalist and civic-minded—and show that these significantly explain heterogeneity in preferences and land enrolment decisions. Productivist farmers demand higher compensation and commit less land, while environmentalist and civic-minded farmers are more inclined to participate and enrol larger areas, even at lower compensation levels. These findings highlight the importance of tailoring agri-environmental contracts to farmers' identities through for example framing of agri-environmental contracts accordingly. Privately financed schemes, such as those based on crowdfunding platforms, must address perceived risks, offer advisory support and develop communication strategies that resonate with different identity profiles. Recognising farmer identity as a behavioural driver can enhance participation in both public and private agri-environmental schemes and inform more effective contract design.

**JEL Classification:** Q18, Q28, Q57, D81

## 1 | Introduction

The agricultural sector is a major source of greenhouse gas emissions and contributes significantly to pesticide and nutrient contamination of groundwater, biodiversity loss, and soil degradation (Beckmann et al. 2019; Felipe-Lucia et al. 2020; Foley et al. 2011). To mitigate these negative externalities, policymakers are increasingly pressured to reduce agriculture's environmental footprint (Garcia et al. 2020). Additionally, agricultural

policies aim to strengthen farmers' roles as land stewards by emphasising biodiversity preservation, supporting cultural ecosystem services, and promoting the conservation of natural habitats (Pe'er et al. 2020; Röder et al. 2021).

In the European Union, farmers can implement Agri-Environmental Climate Measures (AECM) to promote sustainable agricultural practices, enhance biodiversity, protect natural resources, and contribute to climate change mitigation

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and adaptation, while receiving financial support under the Common Agricultural Policy (CAP) (Uthes and Matzdorf 2013). However, many AECMs suffer from inadequate spatial targeting and often fail to achieve meaningful environmental improvements (Batáry et al. 2015; Uthes and Matzdorf 2013; Uthes et al. 2010). Since these measures do not always align with farmers' preferences, their voluntary nature results in low participation, underscoring the need for innovative policy solutions (Sattler et al. 2023; Schulze and Matzdorf 2023; Tyllianakis et al. 2023).

Policymakers have set ambitious climate and biodiversity targets as outlined in the European Green Deal and the Nature Restoration Law for 2030 (Cuadros-Casanova et al. 2023; Hasler et al. 2022). The European Green Deal aims to achieve climate neutrality by 2050, with an intermediate target of 55% reduction in greenhouse gas emissions by 2030 (European Commission 2021). Meanwhile, the Nature Restoration Law sets binding targets to restore at least 20% of the EU's land and sea areas by 2030 and all degraded ecosystems by 2050 (European Commission 2024). To meet these objectives, policymakers must enhance the effectiveness of AECMs in terms of both economic performance and environmental impact (OECD 2023). However, achieving these goals requires either making AECMs more attractive to farmers or developing alternative mechanisms for environmental protection on agricultural land (Bredemeier et al. 2022; Kelemen et al. 2023; Pe'er et al. 2021; Röder et al. 2021).

In addition to government-funded AECMs, privately financed measures offer a viable mechanism for achieving political ambitions, as emphasised in the Kunming-Montreal Global Biodiversity Framework. These often market-based solutions are thereby considered an attractive option due to their capacity to scale up private investments (Swinfield et al. 2024). While research on the demand side found that businesses are motivated to engage in biodiversity conservation by a mix of economic, regulatory, ethical and moral considerations (Liu et al. 2025), little is known about farmers' engagement in private measures. In private payment schemes, farmers do not receive government subsidies but instead obtain funding from the private sector (Chen et al. 2024). This funding could take various forms, such as selling nature conservation certificates to private individuals or companies (Ansink et al. 2022). Compared to publicly financed AECMs funded by CAP subsidies, private payment schemes show two key advantages. First, private payment schemes provide additional funding for conservation projects and may also generate payments exceeding the level of opportunity cost for farmers, as payments may be linked to market dynamics rather than being calculated on the basis of income foregone. Second, privately financed contracts offer increased institutional flexibility in designing specific measures, as they are not bound by supranational regulations. While these arguments are theoretically compelling, there is currently no empirical evidence comparing farmers' willingness to engage in private versus public schemes. Moreover, it is not clear which institutional contract design features they would prefer in private payment schemes. Recent systematic literature reviews clearly outline the need for research on innovative contract features and their potential to implementation (Schulze et al. 2024).

Alongside the idea of acquiring alternative funding sources for agri-environmental contracts, two innovative contract designs are currently being discussed and partially implemented in practice to enhance the appeal of agri-environmental contracts: result-based payments and collective AECMs (Bredemeier et al. 2022; Sattler et al. 2023). Result-based payments reward farmers based on achieved environmental outcomes rather than compensating them for prescribed management practices (Burton and Schwarz 2013). This approach can make AECMs both more effective and cost-efficient, as payments are tied to measurable results, ensuring that resources are allocated based on actual environmental contributions rather than compliance with predefined actions (Elmiger et al. 2023; Matzdorf and Lorenz 2010; Reed et al. 2014). Additionally, result-based payments increase farmer autonomy by allowing them to select the management practices they consider most effective for achieving environmental goals (Gars et al. 2024).

Collective agri-environmental schemes, in turn, encourage groups of farmers to collaborate in implementing AECM (Barghusen et al. 2021; Limbach et al. 2023; Prager 2015). Joint implementation of conservation measures at the landscape or community level—such as biodiversity corridors, watershed management, or peatland restoration—can lead to improved environmental outcomes (Mills et al. 2011). Moreover, collective approaches may foster social learning (Wynne-Jones 2017), could strengthen local identity (Riley et al. 2018), and enhance the cost-effectiveness of AECMs (Westerink et al. 2017). Despite the potential advantages of collective and result-based contracts, their integration into existing government policies has been slow (Kelemen et al. 2023; Sattler et al. 2023). As an alternative, private payment schemes could offer a platform for these innovative contract designs. Building on this literature, our study explores how private payment schemes may serve as vehicles for implementing innovative contract designs, such as result-based or collective schemes. These schemes could not only improve ecological outcomes but also engage farmers who have previously remained outside conventional conservation programs, thus addressing both environmental and participation gaps identified in earlier studies.

To assess farmers' acceptance of novel agri-environmental contracts, economic experiments have proven useful to assess acceptance ex ante implementation (Colen et al. 2016; Palm-Forster and Messer 2021). Previous literature found that farmers' preferences for agri-environmental contract design vary widely and are influenced by general farm and socio-economic characteristics (Schulze et al. 2024). However, less research has explored how farmers' agricultural identity, such as the 'good farmer' identity shaped by visible land management practices, influences their acceptance of agri-environmental contracts. Preferences, by definition, are comparative judgments between alternatives (Ben-Akiva et al. 1999), whereas identities reflect the characteristics, roles, and affiliations individuals associate with themselves and others (Hogg et al. 1995). From a behavioral perspective, both preferences and identities are considered distal psychological factors, meaning they develop over time and are relatively removed from specific decision-making processes (Dessart et al. 2019). While some research has linked

preferences and identities in the context of biogas investments (Zemo and Termansen 2022), no studies have yet addressed their role in agri-environmental commitments.

In the context of agri-environmental contract design, empirical evidence highlights the importance of the farmer identity (Thomas 2019). Depending on the indicators that farmers associate with good farming practices, they may prioritize nature conservation differently. According to Burton et al. (2020), a ‘good farmer’ is someone who

[...] produces crops, manages livestock, and maintains a tidy farm, performing these tasks at a level of competence expected by others in their social group.

Farmers’ perceptions of what constitutes a ‘good farmer’ can influence their willingness to participate in AECMs and shape their contract preferences (McGuire et al. 2015). However, existing research does not distinguish between public and private agri-environmental contracts, nor has the concept of identity been used to explain preference heterogeneity in agri-environmental contract design. This presents an important research gap, particularly in the context of private payments, where a targeted approach is essential to introduce these new payment schemes. In that line, recognising farmers’ identities could help develop more effective communication strategies for engaging farmers in privately financed agri-environmental contracts.

A growing body of stated-preference research compares practice-based and result-based agri-environmental schemes, generally finding that purely result-based designs are less preferred unless outcome risk is shared, monitoring is credible, and payments sufficiently compensate for that risk (Anougmar et al. 2025; Block et al. 2024; Tanaka et al. 2022; Thiermann et al. 2023; Villanueva et al. 2024). Only in a few grassland contexts result-based payments are preferred (Canessa et al. 2023; Šumrada et al. 2022). Moreover, hybrid designs, that is, schemes that combine practice-based payments with a result-based bonus, also tend to be more attractive to farmers than purely result- or practice-based contracts (Canessa et al. 2023; Gars et al. 2024). Synthesising the empirical evidence from recent years, two key gaps stand out. First, most studies compare practice- and result-based schemes within public programs, leaving limited evidence on private or market-based contracts and on how perceived risk differs by contract source. In Europe, existing research has primarily focused on farmer preferences regarding the funding of carbon sequestration programs (Block et al. 2024). In those carbon programs, result metrics are typically expressed in tonnes of CO<sub>2</sub>-equivalents (tCO<sub>2</sub>e), whereas grassland AECMs commonly rely on ecological indicators such as observed plant species richness on fixed transects (Elmiger et al. 2023; Ruas et al. 2021). These outcome metrics differ in observability, temporal variability, and verification protocols, which likely affects perceived risk and contract attractiveness (Hagemann et al. 2025). Second, behavioural heterogeneity, such as differences in farmer identity, and its relationship to the intensive margin (i.e., the share of land enrolled) are rarely addressed. Building on this literature, we employ a labelled DCE to compare public and private

contracts that vary in practice- versus result-based logic, collaboration, and advisory support. We embed the private option in a real marketplace context and analyse both participation decisions and land enrollment through the lens of farmer identity profiles.

This study examines farmers’ willingness to participate in governmental- and privately financed agri-environmental payment schemes while incorporating result-based and collective approaches as innovative contract design features. Additionally, it considers the role of the ‘good farmer’ identity as a driver of preference heterogeneity. The primary research questions are: (1) What are farmers’ preferences for privately financed versus publicly funded agri-environmental contracts? (2) What factors influence farmers’ land allocation decisions regarding agri-environmental contracts? and (3) Can the concept of the ‘good farmer’ identity help explain the diversity of preferences?

Within the scope of this study, we investigate both contract choice and land allocation to specific contracts. Most studies focus solely on contract choice (Schulze et al. 2024). However, to achieve the objectives outlined in the Green Deal and Nature Restoration Law, it is not enough for many farmers to enroll in conservation contracts—as most targets also consider land area as a key metric. Understanding both the extensive margin (contract choice) and the intensive margin (land allocation) provides more nuanced policy recommendations (Latacz-Lohmann and Breustedt 2019).

We contribute to the literature on innovative agri-environmental payment schemes in three major ways. First, we examine farmers’ preferences for privately funded agri-environmental contracts—an area that remains largely understudied. Second, by incorporating contract design features such as result-based payments and collective elements, we advance discussions on innovative agri-environmental contract approaches. Third, we provide insights on the role of farmer identity to explain farmers’ preference heterogeneity for agri-environmental contracts. These contributions have broader implications for policy development and the design of stated preference surveys, which are discussed throughout the paper.

The data used in this study were collected through an online choice experiment conducted in November 2022 with 366 farmers in Germany. The survey specifically targeted grassland farmers, as the measures presented focused on the conservation of grassland habitats. In the labelled choice experiment, respondents chose between a government-funded and a privately funded grassland conservation measure, with the option to decline participation in either contract.

## 2 | Farmer Identity in Agri-Environmental Contract Design

### 2.1 | Role of Farmer Identity

Neoclassical economic theory predicts that farmers participate in agri-environmental contracts when the compensation payment exceeds the costs of participation. However, numerous studies

suggest that financial rewards are not the only motives driving participation (see Klebl et al. (2023) for review). Behavioral factors often play a significant role and influence farmers' decisions to engage in agri-environmental programs (Schaub et al. 2023). These factors can be classified as dispositional, social or cognitive (Dessart et al. 2019).

While cognitive and dispositional factors have been extensively studied in empirical research (Schaub et al. 2023; Schulze et al. 2024), social factors, such as farmer identities, have received less empirical attention. Identities, defined as the roles and commitments individuals hold within a given social structure (Akerlof and Kranton 2005), are crucial in decision-making. In particular, the 'good farmer' identity reflects the agricultural practices that farmers perceive as defining for their social group. It has been shown that farmers can be classified as productivists, environmentalists, civic-minded, or naturalists based on this identity spectrum (McGuire et al. 2015). These identity archetypes differ in how farmers perceive the environment, their enjoyment of collaboration, and their evaluation of certain management practices as integral to their role (Burton et al. 2008). Consequently, incorporating farmer identities into research is likely to improve our understanding of their engagement in private, result-based, and collaborative AECMs. For instance, private payment schemes offer greater flexibility in designing nature conservation projects, allowing farmers to adjust agri-environmental measures to local circumstances and individually preferred settings. As a result, these schemes may be particularly appealing to environmentalist farmers compared to productivist farmers.

Previous studies using the 'good farmer' identity concept have largely drawn on Bourdieu's theory of capital (Burton et al. 2020). According to this theory, symbolic capital—such as prestige, honour and recognition within a social group—plays a key role in determining individuals' positions within social structures and their ability to access and control resources (Bourdieu 1986). Qualitative studies from Germany and the UK have found that governmental AECM often fail to provide opportunities for farmers to develop or demonstrate skilled performance, thereby inhibiting the development of symbolic capital (Burton et al. 2008). Evidence from the US indicates that conservation tillage practices are influenced by farmers' identities and that erosion control measures act as cultural symbols (Lavoie and Wardropper 2021). Research from the UK suggests that the symbols of 'good farming' have evolved over time, broadening the concept of what is considered good farming (Riley 2016). Additionally, empirical quantitative studies in the Netherlands have shown that self-identity is the strongest predictor of farmers' intentions to engage in non-subsidised conservation practices (Lokhorst et al. 2011; van Dijk et al. 2016). However, to our knowledge, no quantitative research has yet explored how farmers' preferences for agri-environmental contracts align with their identities. In particular, within the discussion of private versus public agri-environmental contracts, there is no empirical evidence on whether farmer identity serves as a predictor of preference heterogeneity for different payment schemes and other innovative contract design elements.

## 2.2 | Capturing Identities

In this study, we investigate how the 'good farmer' identity influences participation in agri-environmental payment schemes. To achieve this, we use a psychometric scale consisting of 31 indicators that capture diverse aspects of agricultural practice, as outlined by McGuire et al. (2015), and integrate them in the intensive and extensive margin contract decision (see Table A1 for the full list of indicator items). Following McGuire et al. (2015), farmer identity is measured by asking farmers about the importance of different qualities in a 'good farmer' across 31 items:

People have different opinions about what makes a 'good farmer'. Please rate the following items in terms of their importance to what characteristics make a good farmer.

Depending on which activities farmers associate with good agricultural practice, we approximate latent productivist, conservationist, civic-minded, or naturalist identities. We investigate their relationship with preferences for uptake of public and also private agri-environmental contracts, and explore how they affect land enrolment decisions.

## 2.3 | Formalisation and Implications for Agri-Environmental Behaviour

Starting from the expected utility framework, we assume that farmers are utility maximisers. In the context of agri-environmental contracts, this means that farmers weigh the costs of implementation against their benefits. Therefore, farmers participate in agri-environmental contracts when the (expected) financial gain outweighs the (expected) costs of implementation. This analysis is then further enhanced by economic identity theory (Akerlof and Kranton 2005), which incorporates farmer identity into the (expected) utility maximisation problem. In addition to the benefits and costs of the agri-environmental contract, identity is included as a factor, representing gains or losses in utility based on behaviour that either conforms to or deviates from the norms associated with particular social categories (identities). This can be formalised as follows:

$$U(X, C; E) = U(X) - U(C) + U_E - t_E |C^*(E) - C| \quad (1)$$

where  $U$  represents the farmers' utility,  $X$  captures different features of an agri-environmental contract,  $C$  is the cost of implementing the contract, such as exerted effort or opportunity cost, and  $E$  denotes the 'good farmer' identity category (such as productivist, environmentalist, or civic-minded). In our study context,  $X$  encompasses the attributes of the scheme such as the contract design features and the subsidy.  $U(X)$  represents then the utility derived from the contract design features of the contract,  $C$  accounts all the financial and non-financial costs associated with participation in the agri-environmental contract.  $U(C)$  reflects the disutility from the exerted effort  $C$  required to implement the contract.  $C^*(E)$  represents the

identity category specific ideal effort of the farmer and serves as a reference point for ‘acceptable’ level of effort exerted for the identity category  $E$ . Here,  $U_E$  captures the identity-specific utility a farmer derives from belonging to a particular identity category  $E$ , such as identifying as an environmentalist, productivist, or civic-minded farmer. This term reflects the intrinsic satisfaction or alignment associated with contract participation that resonates with one’s identity.

The term  $t_E|C^*(E) - C|$  represents the disutility from deviating from identity-specific behavioural norms, where  $C^*(E)$  is the ideal effort level associated with identity category  $E$ . In practice, this means that farmers experience utility losses when required efforts exceed or fall short of what aligns with their identity. Consequently, the derivative of utility with respect to effort  $C$  is not always positive but depends on the relationship between actual and identity-congruent effort.

Furthermore, the following conditions can be derived from the model, indicating the effort exerted for agri-environmental contracts and norms associated with particular identity categories:

$$\frac{\partial U(X, C; E)}{\partial C} > 0, \quad \frac{\partial U(X, C; E)}{\partial C^*(E)} < 0, \quad \text{if } C < C^*(E) \quad (2)$$

For  $C^*(\text{productivist}) < C^*(\text{civic-minded}) < C^*(\text{environmentalist})$ .

This suggests that a farmer who strongly identifies as an environmentalist is more likely to engage in agri-environmental contracts and thus is predicted to expend comparatively greater effort on agri-environmental contract implementation. Conversely, a farmer who identifies as a productivist is expected to prioritise agricultural production over nature conservation and, as a result, is likely to exert less effort in agri-environmental contracts.

According to identity economic theory, environmentalist farmers are more likely to participate in agri-environmental contracts than productivist farmers, regardless of contract design. This is because environmentalist farmers perceive agri-environmental contracts implementation as a symbol of competence, whereas productivist farmers tend to regard well-maintained, clean fields as indicators of a successful farming business (McGuire et al. 2015). Moreover, because productivist farmers prioritize agricultural production, they perceive higher opportunity costs when considering the adoption of agri-environmental contracts.

Beyond the general tendency to participate in agri-environmental contracts, we also anticipate distinct preference patterns for different contract attributes. Regarding compensation payments, we expect that an environmentalist farmer is willing to enter contracts with relatively low compensation payments and therefore would require lower compensation to exert a given level of effort toward environmental activities compared to a productivist farmer. This is because farmers who primarily view themselves as food producers assign greater economic value to food production and

therefore face higher opportunity costs when engaging in nature conservation activities. As a result, the availability of either public or private contracts may not significantly influence productivist farmers, as their symbol of competence remains food production. However, environmentalist or civic-minded farmers are more likely to consider private alternatives compared to productivist farmers, as they perceive privately financed schemes as a viable option for exhibiting their competence. However, environmentalist and civic-minded farmers are generally more open to engaging in both private and public agri-environmental contracts, with a particular tendency to view privately financed schemes as a viable option for demonstrating their environmental commitment and competence.

Empirically, we approximate the influence of identity on preferences by interacting identity factor scores derived from the psychometric scale with contract attributes in the discrete choice model. This allows us to estimate how identity affects both the overall utility from contract participation ( $U_E$ ) and the sensitivity to contract design features reflecting alignment or misalignment with identity norms ( $t_E$  term).

### 3 | Research Design

#### 3.1 | Case Study: Extensive Grassland Management

The focus of this study is on extensive grassland management, which is part of agri-environmental programs in most federal states in Germany and in other parts of Europe. Extensive grassland is particularly important because it provides a range of essential ecosystem services, including biodiversity, soil fertility, and potentially carbon storage (Feurdean et al. 2018; Holzknecht et al. 2025; Jandt et al. 2022; Schils et al. 2022; Shipley et al. 2024). However, since the 1950s, large areas of species-rich grasslands in Germany have been lost (Schulz et al. 2014; Wesche et al. 2012), primarily due to agricultural intensification and conversion to arable land (Jacquemyn et al. 2011; Melts et al. 2018).

To protect species-rich grasslands, government funding programs have been implemented. While the requirements for extensive grassland management vary slightly across federal states in Germany, we standardised prescriptions for presentation to farmers in the survey (Table 1).

#### 3.2 | Contextualising Private Agri-Environmental Contracts

The aim of this study is to investigate farmers’ trade-offs when considering different agri-environmental contracts for grasslands. Specifically, we explore whether privately financed agri-environmental contracts present a viable alternative to government-funded contracts under the CAP. This study uses the crowdfunding-based AgoraNatura marketplace<sup>1</sup> as a case example, where privately financed agri-environmental contracts are implemented by selling nature conservation certificates to private individuals or companies (Chen et al. 2024). Launched

**TABLE 1** | Extensive grassland measures characterised in the study.

Extensive pasture use	Extensive meadow and mown pasture use
<ul style="list-style-type: none"> <li>• No use of nitrogen-containing mineral fertilisers</li> <li>• No application of pesticides</li> <li>• No turning or loosening of the soil for reseeded preparation</li> <li>• Average annual livestock density of at least 0.60 large roughage-eating livestock units per hectare of permanent grassland and a maximum of 1.40 large roughage-eating livestock units per hectare of permanent grassland</li> </ul>	<ul style="list-style-type: none"> <li>• No use of nitrogen-containing mineral fertilisers</li> <li>• No application of pesticides</li> <li>• No turning or loosening of the soil for reseeded preparation</li> <li>• Late mowing or a maximum of two mowings per year</li> <li>• Minimum cutting heights of 8 cm to protect animals</li> <li>• Preservation of field edges and marginal strips as retreat areas</li> <li>• Non-simultaneous mowing of all meadows to provide retreat spaces for insects</li> </ul>

in 2021, the marketplace was developed over a five-year period in collaboration with German environmental NGOs. During its development, farmers were also actively involved, and several pilot projects, although not yet integrated into the online platform, were implemented to test the concept in practice. On this marketplace, farmers develop project ideas and determine the duration, size, and cost of their projects, thereby setting the price for each nature conservation certificate. These project ideas are then evaluated and certified by an independent certification body. Payments are received only if all certificates are sold within a specified timeframe. Farmers also have flexibility in designing the contract specifications for their projects. Past privately financed contracts concerned, for example, specific fruit orchards or spatially targeted protection of amphibians on arable land.<sup>2</sup>

Within the survey, the crowdfunding platform was introduced and explained to participants. Moreover, the link to the platform was provided so farmers could visit the marketplace and familiarise themselves with it. Even though we did not track whether respondents actually left the survey platform to access the marketplace, having the option to access a real life example likely improves the perceived realism of the study. At the time the platform was launched, most pilot projects were initiated offline, with only a few implemented directly through the online platform. For this reason, an ex-ante analysis of farmers' preferences regarding the institutional design of private contracts was essential to ensure that the platform's settings were aligned with farmers' needs and expectations. With this setting in mind, the study addresses three primary research questions: on (1) farmers' contract design preferences, (2) land enrolment in private agri-environmental contracts and (3) the role of farmer identity in engaging with these types of contracts.

### 3.3 | Methodology

#### 3.3.1 | Choice Experiment Survey Design

This study employs a labelled choice experiment to capture farmers' preferences for various agri-environmental contract designs. The method is based on Lancaster's characteristics theory of value, which posits that it is not the good itself but its attributes that provide utility to individuals (Lancaster 1966). In a choice experiment, respondents are asked to choose their

preferred alternative from a set of choice scenarios, with each alternative described by attributes that vary in levels.

The analysis of choices and the valuation of attribute levels are grounded in random utility theory, which asserts that an individual's utility is composed of both a deterministic and a random component (McFadden 1974). The parameters of the deterministic component of the utility function can be estimated, allowing the calculation of the marginal rate of substitution between attributes, which represents the trade-offs between them. If one of these attributes is expressed in monetary terms representing payment or compensation, measures of willingness to pay (WTP) or willingness to accept (WTA) can be derived, providing valuable information for cost-benefit analysis and policy design.

In recent years, choice experiments have increasingly been used in the context of agri-environmental contract design to explore preferences for land use prescriptions and contract features (Schulze et al. 2024). This study examines the contract preferences of German farmers for privately funded agri-environmental contracts, focusing on a hypothetical grassland measure that can be either privately or governmentally funded. Respondents were given the option to choose between a private or governmental agri-environmental measure, or not to participate. The agri-environmental measures varied based on the attributes described in Table 2 (a detailed description of the attribute levels and how they were depicted in the survey is found in Appendix C, as well as Table A2).

The attribute levels were contextualised for both private and governmental contracts. For the *Contract partners* attribute, a governmental contract would mean that farmers enter the contract as part of a cooperative, whereas a private contract would imply that an environmental NGO acts as an intermediary between the farmer and the buyer. Similarly, for the *Compensation* attribute, it was noted that in private contracts, farmers can usually set the prices themselves, although suggested price levels were provided in the survey. The definition of attributes and their respective levels was informed by a Q-methodology study conducted prior to the survey (Schulze and Matzdorf 2023) and intensive stakeholder interactions (with different formats) dealing with innovative contract solutions for the provision of agri-environmental public goods within the EU Horizon 2020 contracts2.0 project.<sup>3</sup> The wording of the attribute descriptions was pre-tested in three farmer interviews to ensure neutrality and balanced language.

**TABLE 2** | Attributes used to characterise AECM contract.

Attribute	Description	Level	Type
Payment mechanism	Payment criteria of the agri-environmental contract	Practice based, Result based	Binary (0-Practice based, 1-Result based)
Contract partners	Option to involve partners in the contract and implement measure cooperatively	None, cooperative	Binary (0-none, 1-cooperatives)
Advisory services	Option to have advisory services included in the contract	None, inclusive	Binary (0-none, 1-inclusive)
Compensation	Compensation payments per hectare	350–830 Euros/ha/year	8 equally-separated levels

	Governmentally funded	Privately funded	no contract
Payment mechanisms	Result based payments	Result based payments	
Contract partners	<b>with</b> other contracting parties	<b>without</b> other contracting parties	
Advisory services	<b>no</b> advisory	<b>no</b> advisory	
Payment	350 €/ha/year	530 €/ha/year	
Which contract would you choose?	<input type="radio"/> Governmentally funded	<input type="radio"/> Privately funded	<input type="radio"/> no contract

If you have chosen one of the two contract options, how many hectares of your land would you enroll under the contract? (If you have not selected either contract, please enter "0".)

Please enter your answer here

 ha

**FIGURE 1** | Example choice task of the study (translated from German). [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

During these interviews, farmers were asked to think aloud as they read through the survey, allowing us to identify and adjust any potentially biased or unclear phrasing. The attributes *payment mechanism* and *contract partner* were included to capture preferences for innovative contract features, such as result-based and collective implementation. In addition, the DCE assessed preferences for advisory services, which have been shown to support the implementation of spatially targeted agri-environmental measures (Prager et al. 2017; Prager and Freese 2009). The range of the compensation attribute was based on actual payment levels for ‘species-rich grasslands’ observed across various German federal states. To allow for broader preference detection, the range was extended to include both lower minimum and higher maximum payment levels.

Before the choice tasks, respondents received information about the online marketplace and grassland management, as well as the differences between private and governmental payments for AECM. They were also presented with an introductory choice task that explained each part of the choice task in detail (see Figure A1). Before proceeding to the choice tasks, respondents were presented with a ‘cheap talk’ script designed to reduce potential hypothetical bias (see Appendix B).

Each of a total of 12 choice tasks (see 3.3.2) was followed by a question about the number of hectares (ha) that farmers would enroll under the chosen contract (see Figure 1).

After the choice experiment, respondents were debriefed and asked about the consequentiality of their choices. The fourth part of the survey focused on farmer identities and presented respondents with 31 ‘good farmer’ statements (based on McGuire et al. (2015)), which they rated on a 5-point Likert scale, ranging from ‘not important’ to ‘very important’. Lastly, farm and farmer characteristics were collected to assess the representativeness of the sample.

### 3.3.2 | Experimental Design

The experimental design of the labelled choice experiment incorporates the idea that parameter values are distinct for both private and public contracts. Prior to the study, various experimental designs (fractional factorial, orthogonal, Bayesian and Bayesian efficient design) were created and compared using simulations for bias and efficiency.<sup>4</sup> The prior values for the Bayesian efficient design were based on coefficient estimates from the literature in similar study contexts (Latacz-Lohmann and Breustedt 2019). Additionally, a power analysis was conducted for each design and compared. A sample size of 330 was assumed, as dictated by the available budget. In terms of bias and efficiency, the Bayesian efficient design optimised for a MNL model, consisting of 36 choice tasks grouped into three blocks, performed best compared to the other designs.<sup>5</sup>

### 3.3.3 | Survey Administration

The survey was administered by a professional survey company specialising in farmer panels and conducting surveys with farmers in Germany. To incentivise participation, respondents who completed the survey were eligible to enter a lottery to win a voucher for farming tools. To qualify, respondents had to be actively involved in land-use decisions. Those who did not meet this criterion were screened out at the beginning. The survey was distributed through an online panel, and 1488 farmers chose to participate. Of these, 366 successfully completed the survey. However, 87 respondents consistently selected the opt-out option.

Compared to national statistics, our sample is younger (national average age: 53 years) and manages larger farms (national average: 63 ha). Additionally, the proportion of arable land in our sample is higher than the national average, while the share of managed grassland is lower (national average: 28%).

To identify protest responses, we asked those who always opted out about their motivations (Villanueva et al. 2017). If respondents indicated that the compensation payments were too low, they were retained in the sample, as this suggested a WTA exceeding the highest amount included in the study. Any other response indicated a protest, and those respondents were excluded from the choice experiment analysis (see Appendix F for detailed opt out debriefing). The sample characteristics are shown in Table 3, which also differentiates between protesters and non-protesters. On average, protesters are older, more likely to have vocational rather than university training, work fewer full-time hours, and are less likely to participate in organic farming than non-protesters. Ultimately, 300 respondents were included in the final sample.

## 3.4 | Econometric Framework

Our econometric approach follows several steps to (a) capture the spectrum of farmer identities, (b) estimate farmers' contract preferences contingent on identity scores, and (c) model farmers' land allocation to specific contracts.

### 3.4.1 | Factor Analysis

Prior to examining contract preferences, we explore 'good farmer' identities within our sample. To capture the latent identities, we conducted a factor analysis with subsequent varimax rotation on respondents' ratings of the 31 'good farmer' statements. In doing so, we followed the psychometric scale developed by McGuire et al. (2015), which consists of 31 statements related to farming practices in the United States. While originally designed for a U.S. context, the content of the items is broadly applicable to European farming systems as well. This approach enabled us to identify underlying common response patterns in the survey, which we attributed to distinct farmer identities.

An important result of the factor analysis is the generation of factor scores, which indicate the strength of association between

an individual farmer and a particular identity. By construction, these factor scores are uncorrelated, with a mean of zero and a standard deviation of one. A key advantage of using factor scores, compared to item-based indices, is that they represent latent factors and are inherently uncorrelated, making them free from measurement bias. The factor analysis was conducted in R with the nFactors package (2.4.1.1).

### 3.4.2 | Mixed Logit

We use a mixed logit model to capture the effect of attribute and information manipulations on stated preferences while simultaneously accounting for unobservable heterogeneity in preferences. To simplify interpretation, we estimate the model directly in WTA space (Train and Weeks 2005), so that each estimated parameter reflects WTA for each attribute rather than its effect on utility. In this context, the utility of individual  $i$  choosing alternative  $j$  in choice situation  $t$  can be expressed as:

$$U_{ijt} = -\lambda_i p_{ijt} + (\lambda_i w_i)' x_{ijt} + \epsilon_{ijt} \quad (3)$$

where  $p_{ijt}$  specifies the price,  $x_{ijt}$  represents the vector of observed non-price attributes of the alternative  $j$ ,  $\lambda$  describes the scale-adjusted utility coefficients,  $w$  denotes the corresponding willingness-to-accept for specific attributes and  $\epsilon_{ijt}$  captures the unobserved component of the utility.

In the mixed logit model, the probability of individual  $i$  choosing alternative  $j$  from a set of  $J$  available options can be, therefore, expressed as:

$$P_{ijt} = \int \frac{\exp(U_{ijt})}{\sum_{k=1}^J \exp(U_{ikt})} f(w|\theta) dw \quad (4)$$

where  $f(w|\theta)$  is the probability density function of the parameters. We assume all parameters are normally distributed, except for the compensation parameter, which follows a log-normal distribution.

The model is estimated with the Apollo package in R (Hess and Palma 2019) using maximum simulated likelihood with the BFGS algorithm and 10,000 Sobol draws.

### 3.4.3 | Modelling Intensive Margin Decision

In addition to modelling farmers' contract preferences, we analyse farmers' decision of land enrolment in agri-environmental contracts. Again, the idea is to gain insights on whether contract design features might impact not only the contract choice, but also the intensity of enrolment. Moreover, we want to learn whether farmer identity impacts the enrolment decision. Therefore, we compute the share of land to a specific contract  $j$  from the total land available to the individual farmer  $i$ , represented as the dependent variable  $y_{ijt}$ . The independent variables include contract characteristics specific to choice card contracts  $j$  and farmer identity-related factor scores from the factor analysis ( $Z_{ijt}$ ).

**TABLE 3** | Sample characteristics and test for differences of protesters and non-protesters.

Variable	<i>N</i>	No protest, <i>N</i> = 300 <sup>a</sup>	Protest, <i>N</i> = 66 <sup>a</sup>	<i>p</i> <sup>b</sup>
Age of respondent	328	47.16 (11.82)	52.53 (9.61)	0.001
What is the highest attained education level?	352			0.006
None		0.7%	0%	
Secondary qualification		6.6%	14%	
Highschool diploma		12%	1.6%	
Vocational training		38%	49%	
University degree		33%	21%	
Not specified		10%	14%	
What is your gender?	350			0.11
Female		6.3%	3.2%	
Male		91%	89%	
Not specified		2.8%	7.9%	
Share of farm income on overall income	352			0.6
100%		16%	17%	
75%–100%		27%	19%	
50%–75%		14%	13%	
25%–50%		15%	13%	
Less than 25%		21%	27%	
Not specified		6.9%	11%	
Are you a full time farmer?	353			0.004
Full time		54%	46%	
Part time		43%	41%	
Not specified		2.4%	13%	
Do you participate in organic farming?	353			0.002
Yes		13%	1.6%	
No		82%	87%	
Not specified		4.5%	11%	
Did you participate in the past in AECM?	353			0.002
Yes		68%	46%	
No		27%	43%	
Not specified		4.5%	11%	
Does your farm have a specific focus?	353			0.017
Arable farming		43%	37%	
Horticulture		0.3%	0%	
Permanent crops		1.4%	1.6%	
Forage production		19%	24%	
Processing		6.9%	7.9%	
Mixed		26%	14%	
Not specified		4.1%	16%	

<sup>a</sup>Mean (SD); %.<sup>b</sup>Wilcoxon rank sum test; Fisher's exact test.

$$y_{ijt} = Z_{ijt}\alpha + u_{ijt} \quad (5)$$

Since unobservable factors may influence both contract choice and land allocation, appropriate selection bias correction models are employed to mitigate potential biases (Bourguignon et al. 2007). Following Kuhfuss, Préget, Thoyer, and Hanley (2016), we apply a series of selection bias correction models, which build upon the approach outlined by Bourguignon et al. (2007) and implemented in the `selmlog` package in Stata. To control for selection bias in the enrolment regression, the regression includes terms that are functions of the predicted probabilities of each alternative's choice,  $P(A_{ijt} = 1)$ , estimated in the first step through the mixed logit model. This approach yields unbiased estimates of parameters  $\alpha$  in the enrolment equation (Equation 5), which can be derived using least squares based on the following:

$$y_{ijt} = W_{ijt}\alpha + \sigma \frac{\sqrt{6}}{\pi} \left[ \sum_{k \neq i} r_{kt} \left( \frac{P_{kjt} \ln(P_{kjt})}{1 - P_{kjt}} \right) - r_{it} \ln(P_{ijt}) \right] + w_{ijt} \quad (6)$$

In this equation,  $\sigma$  is the standard deviation of  $u_{ijt}$ ;  $r_{it}$  is a correlation coefficient between  $u_{ijt}$  and  $\epsilon_{ijt}$ ; and  $w_{ijt}$  is a residual, mean-independent from the regressors.  $W_{ijt}$  includes the characteristics of the alternative specific contract  $A_{ijt}$  of choice card  $C_i$  and the individual characteristics of farmer  $i$ .

## 4 | Results

We organise results according to the methods applied in this study. First, we present the findings of the factor analysis of the 'good farmer' statement rankings. Second, we show the results of farmer preferences from the mixed logit model with factor score interactions. Finally, we outline the results of farmers' enrolment decisions.<sup>6</sup>

### 4.1 | Factor Analysis

The factor analysis of the 31 'good farmer' ratings revealed three underlying latent factors, which were interpreted as distinct farmer identities within the data (Table A1). These identity profiles broadly align with the typology proposed by McGuire et al. (2015), who identified four distinct identity types among U.S. farmers using the same set of indicator statements. In contrast to their four-factor solution, we opted for a three-factor solution, as this provided more distinct and interpretable identity profiles suitable for explaining heterogeneity in choice behavior. Conceptually, our 'environmentalist' profile encompasses aspects of both the 'conservationist' and 'naturalist' identities described by McGuire et al. (2015).

Following McGuire et al. (2015), we interpreted the identity categories based on the pattern of item loadings. Specifically, Factor 1 loaded positively on statements related to environmental protection, suggesting an 'environmentalist' orientation. Factor 2 showed negative loadings on environmental statements

but positive loadings on production-oriented items, which we interpreted as representing 'productivist' values. Factor 3 loaded positively on statements about community involvement, indicating a 'civic-minded' identity. These factor-specific loading patterns guided the construction of the identity narratives used in our analysis. The results of the factor analysis were based on key diagnostic statistics, such as the KMO measure of sampling adequacy (0.83) and the Bartlett's test of sphericity ( $\chi^2 = 2793.85$ ,  $df = 465$ ,  $p < 0.001$ ).

**Finding 1.** There is a diverse range of farmer identities. Among the identities are 'environmentalists', 'productivists', and 'civic-minded' farmers.

Individual factor scores—representing the specific associations of each farmer with the identified factors—are stored for subsequent analysis of choice data and the continuous decision on the number of hectares enrolled per contract. Conveniently, these factor scores are by design orthogonal with mean zero and standard deviation of one (see Figure A2).

### 4.2 | Mixed Logit

The results of the mixed logit model in WTA space with factor score interactions are presented in Table 4 below.

WTA estimates can be directly interpreted as required annual per hectare (ha) compensation payments. For example, entering a publicly financed contract, farmers require 550 Euros per ha/year, whereas for a privately financed contract 693 Euros per ha/year. This difference can be interpreted in two (not exclusive) ways. First, the lower compensation requirement for public contracts may indicate a preference for public over private contracts, reflecting skepticism toward privately financed options. At the same time, farmers may view private contracts as an opportunity to receive payments exceeding opportunity costs, suggesting that they see private contracts as a means to secure higher compensation. Both WTA estimates come with comparatively large standard deviations of 406 and 359 Euros respectively. This preference heterogeneity implies that the required compensation payments vary strongly between farmers, while even a small share of farmers would not require any compensation.

Apart from observing participants' contract choice, we also tracked respondents who never chose a privately financed contract in the presented choice scenarios and asked for their reasoning (Table 5).

Approximately 28% of the respondents never selected a private contract. The main reason for this was the perceived high risk associated with privately financed contracts. As explained prior to the choice experiment, financing for the private contract is only provided if all available project certificates are sold on the online marketplace, which appears to be a significant barrier to engaging in privately financed contracts.

**Finding 2.** On average, farmers require higher compensation payments for private contracts compared to public contracts.

**TABLE 4** | Results of mixed logit model in WTA space with factor score interactions.

	Mean	SD	Interaction: F1 'Environmentalism'	Interaction: F2 'Productivism'	Interaction: F3 'Civic-minded'
ASC (public)	-550.62*** (2.76)	406.51*** (5.51)	59.71*** (6.55)	-47.79*** (4.46)	55.92*** (3.85)
Payment mechanism (public)	-54.16*** (2.25)	173.14*** (4.30)	9.55* (5.80)	-4.52 (4.40)	18.70*** (5.15)
Contract partners (public)	-23.40*** (2.93)	120.03*** (2.89)	32.85*** (6.85)	-7.40 (5.02)	13.27* (5.91)
Advisory services (public)	25.45*** (3.28)	6.35** (2.09)	13.46* (6.59)	-0.01 (4.05)	16.25** (5.79)
ASC (private)	-693.24*** (4.73)	356.54*** (4.59)	59.72*** (4.99)	-17.32** (7.06)	24.94*** (3.04)
Payment mechanism (private)	-53.48*** (4.54)	154.34*** (2.62)	-8.99** (3.80)	18.75** (7.53)	38.55*** (7.16)
Contract partners (private)	-30.14*** (4.25)	67.35*** (5.60)	10.83 (7.58)	-16.76*** (4.50)	0.49 (4.51)
Advisory services (private)	49.86*** (3.27)	138.09*** (4.45)	-26.99*** (3.43)	-17.02*** (4.06)	39.96*** (5.69)
Compensation	-3.86*** (0.23)	1.99*** (0.27)			
No observations	3492				
No respondents	291				
Log likelihood (Null)	-3836.35				
Log likelihood (Converged)	-2509.33				

\* $p < 0.05$ .  
 \*\* $p < 0.01$ .  
 \*\*\* $p < 0.001$ .

**TABLE 5** | Reasons for not selecting private contracts.

Variable	N	N = 83
Private financing seems too risky to me. (yes)	83	56/83 (67%)
The government should pay for nature conservation. (yes)	83	36/83 (43%)
The effort involved in developing a project myself seems too high to me (yes)	83	29/83 (35%)
Governmental funding schemes are just fine (yes)	83	21/83 (25%)

Another contract element in the choice experiment was the payment mechanism, referring to the criteria for issuing payments. Payments could either be made based on the implementation

of defined practices (baseline) or on achieved environmental results. The findings suggest that farmers require on average an additional 54 Euros per ha/year for a result-based contract, compared to the baseline practice-based contract irrespective of the contract being private or public. This can be interpreted as a required risk premium, since result-based payments are often perceived as riskier compared to practice-based alternatives by farmers (Burton and Schwarz 2013). It is important to note that the standard deviation for the payment mechanism is comparatively high, indicating that several farmers have reverse preferences for this attribute. With a mean WTA of -54 Euro with a standard deviation of 173 Euros, about 37% of the farmers would have a WTA larger than zero. In other words, 37% of farmers would need compensation for a practice-based contract and 63% would need compensation for a result-based contract.

**Finding 3.** The majority of farmers prefer practice-based over result-based contracts.

Farmers generally preferred working independently over participating in cooperative contracts. This preference may stem from concerns about collective arrangements, such as the potential loss of self-determination, coordination challenges, and peer pressure within groups (Prager and Freese 2009; Sutherland et al. 2013). The objective was to determine whether farmers prefer to delegate administrative burdens to intermediaries and implement contracts jointly with other farmers. The results indicate that farmers generally prefer to work independently, rather than incorporating intermediaries as additional contract parties. The choice was between implementing the contract individually or involving an intermediary—either between the farmer and the government (public contract) or the farmer and the marketplace (private contract). Farmers demand additional compensation to accept contracts involving intermediaries, requiring 23 Euros per ha/year to enter public and 30 Euros per ha/year to enter private agri-environmental contracts with other contract parties.

**Finding 4.** Farmers value autonomy in agri-environmental contracts.

The last contract attribute concerned the option of having free technical advisory services regarding the implementation of specific agri-environmental measures. Farmers value the option to receive advisory services, as evidenced by their willingness to forego 25 Euros per ha/year for public contracts (standard deviation of 6 Euros) and 50 Euros per ha/year for private contracts (standard deviation of 138 Euros). The low standard deviation for public contracts implies that preferences here are relatively homogeneous with hardly any preference reversal, yet comparatively low. In contrast, the large standard deviation of private contracts implies that farmers have very heterogeneous preferences, with a share of 36% who would rather not have advisory services and about 50% willingness to forego more than 50 Euros. The large heterogeneity is plausible, as private contracts represent a new instrument requiring farmers to familiarise themselves before independently launching their projects. This finding aligns with the existing literature on farmers' ex-ante preferences for agri-environmental contracts, which consistently shows that farmers are willing to trade off compensation payments in exchange for advisory support (Schulze et al. 2024).

**Finding 5.** Farmers value access to advisory services with large heterogeneity for private contracts.

A more nuanced understanding of farmer preferences emerges when considering the interaction between the 'good farmer' identity categories and contract preferences (columns 3–5 in Table 4). The interactions between factor scores and contract attributes reveal how preferences differ among environmentalist, productivist, and civic-minded farmers regarding agri-environmental contracts. As illustrated in Figure A2, the factor scores range between  $-4$  and  $4$ , providing an indication about the magnitude of interaction effects. The WTA estimates presented in Table 4 indicate how a one-unit increase in a factor score influences farmers' required compensation payments. For instance, a one-unit increase in the score of Factor 1 (environmentalist identity) reduces the required compensation for public contracts by 59.71 Euro per hectare. Conversely, a one-unit increase in Factor 2 (productivist identity) raises the required

compensation by 47.79 Euro per hectare, while a one-unit increase in Factor 3 (civic-minded identity) reduces it by 55.92 Euro per hectare.

Farmers who align more with the environmentalist spectrum require lower compensation payments to participate in both private and public contracts. For public contracts, environmentalist farmers prefer working with additional contract parties. However, their preferences for consulting services are mixed: they favor advisory services in public contracts but demand additional compensation payments when advisory services are included in private contracts. Result-based payments are also not favorable for environmentalist farmers, as they require higher compensation for these contracts.

Farmers identifying with the productivist spectrum are generally less inclined to engage in agri-environmental contracts, as evidenced by their high compensation demands reflected in the Alternative Specific Constant (ASC). For private contracts, productivist farmers strongly dislike working with others or receiving advisory services. However, they exhibit a preference for result-based payments in private contracts, where additional contract parties or consulting services are viewed as undesirable features.

Civic-minded farmers display preference patterns similar to environmentalist farmers. The key differences arise within private contracts: while environmentalist farmers dislike result-based payments and advisory services, civic-minded farmers require substantially lower compensation payments for these features, indicating a greater willingness to accept them.

**Finding 6.** The concept of 'good farmer' identity explains part of farmers' preference heterogeneity for agri-environmental contracts.

### 4.3 | Enrolment Decision

The intensive margin decision for agri-environmental contracts, which refers to the allocation of land to a specific contract, was modelled separately using a series of selection bias correction models by calculating the share of land under contract with respect to the overall amount of hectares managed by the farmer (Kuhfuss, Préget, Thoyer, and Hanley 2016; Latacz-Lohmann and Breustedt 2019; Vaissière et al. 2018). These models are characterised by the inclusion of an additional selection bias correction term, which is a function of the choice probabilities outlined in equation (5). Depending on the specification of the selection bias correction term, the models are classified as Lee, Dubin 1 or Dubin 2, as shown in Table 6 (see Bourguignon et al. (2007) for a detailed discussion of these approaches).

Table 6 presents the results, with the share of allocated land as the dependent variable and contract characteristics and factor scores as the independent variables.

Interestingly, most of the contract design features do not influence the amount of land allocated to a contract. This stands in contrast to Kuhfuss, Préget, Thoyer, Hanley, Coent, and Désolé (2016) or Vaissière et al. (2018) who find that farmers

**TABLE 6** | Selection bias correction regression models.

Variables	Lee	Dubin 1	Dubin 2
Public contract	0.06*** (0.02)	0.05** (0.02)	0.04 (0.04)
Payment mechanism	-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.02)
Contract partners	-0.00 (0.01)	-0.00 (0.01)	-0.00 (0.01)
Advisory services	0.00 (0.01)	-0.00 (0.02)	-0.01 (0.03)
Compensation	0.00 (0.00)	0.00 (0.00)	-0.00 (0.00)
F1 'Environmentalist'	0.03*** (0.01)	0.03*** (0.01)	0.03*** (0.01)
F2 'Productivist'	-0.02** (0.01)	-0.02** (0.01)	-0.02** (0.01)
F3 'Civic-minded'	0.03*** (0.01)	0.03*** (0.01)	0.03*** (0.01)
mlee1	-0.07 (0.04)		
(Selection bias correction term)			
mdmf02		-0.05 (0.09)	
(Selection bias correction term)			
mdmf03		0.03 (0.14)	
(Selection bias correction term)			
mdmf11			0.01 (0.06)
(Selection bias correction term)			
mdmf12			-0.02 (0.12)
(Selection bias correction term)			
mdmf13			0.19 (0.52)
(Selection bias correction term)			
Constant	0.09 (0.09)	0.17 (0.19)	0.33 (0.55)
Observations	2039	2039	2039
R <sup>2</sup>	0.03	0.03	0.03

Note: Standard errors in parentheses.

\* $p < 0.1$ .

\*\* $p < 0.05$ .

\*\*\* $p < 0.01$ .

enrol more land to less restrictive and higher paid contracts. In our case, the only factor affecting land allocation is the payment source—whether the contract is publicly or privately financed. Under a public contract, farmers allocate, on average, 6% more land, *ceteris paribus*.

**Finding 7.** Farmers are willing to enrol slightly more land under public compared to private contracts.

An analysis of the factor scores reveals a positive association between the first factor (environmentalist) and the third factor (civic-minded) with land allocation, while the second factor (productivist) has a negative effect. Considering that factor scores range from -4 to 4, enrolment decisions exhibit substantial differences across the identity categories. This finding aligns with the results of the mixed logit model, which indicates, through interactions with the ASCs, that productivist farmers require higher compensation payments to enter contracts, regardless of the contract features. Overall, the results demonstrate that environmentalist and civic-minded farmers are not only more willing to participate in agri-environmental contracts but also tend to allocate more land to the contracts they choose.

**Finding 8.** Environmentalist and civic-minded farmers enrol more land under agri-environmental contracts than productivist farmers.

## 5 | Discussion

This study examined farmers' ex ante preferences for privately financed agri-environmental contracts through a labelled choice experiment. The underlying research questions were: What are farmers' preferences for privately financed versus publicly funded agri-environmental contracts? What factors influence farmers' land allocation decisions regarding agri-environmental contracts? Can the concept of the 'good farmer' identity help explain the diversity of preferences? By incorporating farmer identities into a mixed logit and land allocation model, we demonstrated that identities influence both contract choice (extensive margin) and land enrolment (intensive margin). Our results complement earlier work comparing practice- and result-based schemes by showing how contract source (public vs. private) and identity profiles jointly shape preferences and the amount of land enrolled. In particular, we document a risk-related premium for private contracts tied to marketplace features and demonstrate that identity explains heterogeneity in both margins of adoption.

Farmers required lower compensation for practice-based contracts than for result-based ones. This aligns with findings across Europe, including livestock management in Finland (Niskanen et al. 2021), farmland bird conservation in the Netherlands (Thiermann et al. 2023), and soil protection in the UK (Tyllianakis et al. 2023). Hybrid contracts, offering bonuses for environmental outcomes, followed a similar pattern (Gars et al. 2024). However, studies focusing on tangible results, such as species occurrence, found that some farmers prefer result-based contracts (Canessa et al. 2023; Šumrada et al. 2022).

Farmers generally preferred working independently rather than in cooperative contracts. Research suggests that autonomy concerns can be addressed through social norms and threshold-based bonus payments, which have been effective in France and Slovenia (Kuhfuss, Préget, Thoyer, Hanley, Coent, and Désolé 2016; Šumrada et al. 2022). Farmers also showed a strong preference for free advisory support, consistent with previous studies (Schulze et al. 2024). Interestingly, they were willing to forego twice the compensation for private contracts compared to public ones, likely due to greater familiarity with government schemes and increased reliance on advisory support for private contracts.

## 5.1 | Implications for Privately Funded Schemes

Our findings provide insights into the design of privately funded schemes, particularly crowdfunded-based schemes. Farmers required higher compensation for privately funded contracts, possibly because they perceive greater price-setting power in such schemes, for example, through the ability to influence the value of ecosystem service certificates, compared to the fixed payments typically associated with public contracts. Another interpretation comes from a closer examination of debriefing questions, and an analysis of farmers who consistently avoided selecting private contracts reveals that reluctance primarily stems from perceived risks associated with the marketplace model and private project funding. In the marketplace example, projects are only financed if all project certificates are sold within a specific timeframe. This introduces the risk that projects may not be fully funded and, consequently, not implemented. To mitigate these concerns, private marketplaces should incorporate risk-hedging mechanisms.

Further responses from farmers who consistently avoided choosing the private contract reveal that, besides payment risks, there is the belief that nature conservation should be funded by the government rather than private individuals, and the perception that developing privately financed projects is too complicated. The issue of government responsibility is largely a political matter tied to policy priorities. However, it is essential to clarify that private funding is not intended to compete with public funds but rather to complement them. Private initiatives should communicate this clearly to farmers. Meanwhile, concerns about contract complexity can be addressed by enhancing marketplace support for project development. The choice experiment findings indicate that farmers are willing to forgo higher compensation payments in exchange for advisory services, particularly in privately financed contracts. This aligns with the feedback from farmers who consistently avoided private contract options, reinforcing the need for comprehensive advisory support at the project development stage. Given that the complexity of project design currently poses a major barrier to participation, providing advisory services would significantly enhance adoption rates.

Last, the findings also highlight the need for targeted communication strategies tailored to different farmer identity categories. The results suggest that farmer identities influence how they perceive privately financed agri-environmental contracts. Privately financed contracts often provide more flexibility in the design and communication of conservation measures. This

includes the possibility to incorporate innovative practices and engage directly with buyers or citizens. Such opportunities may be particularly attractive for environmentalist farmers, as they enable them to visibly demonstrate their environmental stewardship and competence, thereby aligning contract participation with their values and farming identity. Moreover, privately financed contracts could play a role in shaping farmer identities over time. As farmers recognize that privately funded measures provide better opportunities for engaging in environmentally friendly practices, this could encourage a shift toward an environmentalist identity.

## 5.2 | Insights on Farmer Behaviour

Research consistently shows that farmers tend to be risk-averse (Rommel et al. 2023). Their preference for practice-based over result-based contracts aligns with this tendency, as result-based contracts involve higher uncertainty due to factors beyond farmers' control (Burton and Schwarz 2013; Gars et al. 2024; Tanaka et al. 2022). This risk aversion is further reflected in their reluctance to engage in private crowdfunding contracts, which are perceived as riskier than government-funded alternatives.

The results of the choice experiment confirm both the significance and diversity of the 'good farmer' identity. According to Akerlof and Kranton (2005) identity theory, farmers act based on their identity category. The factor scores of the empirical analysis thereby served as a proxy for the identity category  $E$  outlined in equation (1). The interaction between factor scores and contract attributes captures the effects of farmer identity on utility derived from contract attributes and thus serves as an estimate for  $U_E$ , the identity utility effects, and  $t_E|C^*(E) - C|$ , the identity-driven effort disutility. More specifically,  $U_E$  represents how much a farmer's identity contributes to overall utility (or disutility) of contract participation which is reflected in the ASC. Meanwhile,  $t_E|C^*(E) - C|$  explains how identity influences preferences for specific contract attributes.

Our findings confirm that identity plays a crucial role in both contract selection and land enrolment, consistent with prior research (Lokhorst et al. 2011; van Dijk et al. 2016). The farmer identities observed in this study correspond to three broad categories: productivist, environmentalist, and civic-minded (McGuire et al. 2015). Productivist farmers prioritise high yields and field maintenance, environmentalists focus on long-term ecological sustainability, and civic-minded farmers emphasise community engagement and knowledge sharing. These identities influence contract preferences, with productivist farmers being the most hesitant to participate in agri-environmental contracts, demanding higher compensation and showing lower predicted adoption rates. This finding aligns with evidence from landscape-level policy responses (McGuire et al. 2015).

Our findings highlight three key reasons why farmer identities are crucial for policymaking. First, understanding farmer identities provides insight into the underlying motivations for participating in or opting out of agri-environmental contracts. For example, a farmer may decide not to participate either because they believe the proposed contract will not produce meaningful environmental outcomes (environmentalist reasoning) or

because they see their primary role as food production (productivist reasoning). Without capturing these identities, policymakers cannot distinguish between these competing motivations. Second, as shown in the factor score interactions of the ASCs, farmers with an environmentalist identity are more likely to adopt agri-environmental contracts even with lower compensation payments, compared to those who adhere to a productivist identity. Therefore, from an efficiency perspective, it is in policymakers' best interest to encourage farmers to identify as environmentalists. In this regard, policies that promote environmentalist identities among farmers, by, for example, nudging environmental benefits of agri-environmental measures, are recommended (Barnes and Toma 2012; Cullen et al. 2020; McGuire et al. 2013). Third, while contract attributes such as compensation payments primarily influence the contract choice, farmer identities impact both contract choice and the amount of land enrolled. Given EU Biodiversity Strategy goals, shifting farmer identities from productivist to environmentalist could encourage greater land enrolment in agri-environmental contracts. Policymakers can achieve this by reinforcing environmental values, promoting community norms, or showcasing the long-term sustainability advantages of agri-environmental measures (Barnes and Toma 2012; Cullen et al. 2020). By leveraging identity shifts, policies can improve adoption rates and achieve broader conservation goals.

### 5.3 | Implications for Stated Preference Research

Beyond implications for the online marketplace and farmer behaviour, our study offers two key contributions to stated preference research and survey design. First, tracing back to Boxall and Adamowicz (2002), we use factor scores in the analysis of preference heterogeneity to (a) operationalise farmer identities using robust psychometric scales in choice modelling and (b) address measurement error through factor analysis. Previous studies that incorporated behavioural factors into choice experiments have typically relied on hybrid choice models, which require relatively large sample sizes to estimate all the necessary parameters of both the measurement and structural components (Mariel and Meyerhoff 2016). However, when working with farmers as the sample population, large sample sizes are often unattainable, resulting in lower statistical power. As a compromise, psychometric scales with fewer indicators can be employed, reducing the number of parameters that need to be estimated. Our approach, on the other hand, allows us to leverage a well-established psychometric scale while maintaining a relatively small sample size, at the cost of an arguably statistically less efficient two-step process. By conducting factor analysis as a first step, we reduce the dimensionality of attitudinal statements into a set of latent factors that are uncorrelated and not subject to measurement error, a major concern when incorporating attitudinal information into choice models that motivates the use of hybrid choice models. The two-step approach used here is therefore a practical option to address challenges for hybrid choice models related to accommodating psychometric scales with many items at relatively low sample size.

Second, incorporating a follow-up question on land enrolment allowed us to gain a more nuanced understanding of agri-environmental contract adoption. Although we found no

evidence that the contract design features examined here influence farmers' intensive margin decisions, studies in France (Kuhfuss, Préget, Thoyer, and Hanley 2016; Vaissière et al. 2018) and Germany (Latacz-Lohmann and Breustedt 2019) suggest otherwise. Our results reinforce the importance of behavioural factors, such as farmer identities, in contract adoption and implementation. For policymakers, understanding both extensive and intensive margin decisions is crucial for achieving EU Biodiversity Strategy goals. We recommend including land enrolment questions in surveys, either through a two-stage process (Kuhfuss, Préget, Thoyer, and Hanley 2016; Latacz-Lohmann and Breustedt 2019; Vaissière et al. 2018) or volumetric choice experiments (Carson et al. 2022), to capture the role of contract design and behavioural factors in agri-environmental contract participation more effectively.

### 5.4 | Limitations and Future Research

This study provides valuable insights but also has limitations related to internal and external validity. Regarding internal validity, the 31-item psychometric scale used to measure the 'good farmer' identity may have led to respondent fatigue, potentially reducing attention to responses. Future research should explore more concise identity measurement approaches, such as reducing the number of items or using proxy measures while maintaining scale reliability.

In terms of external validity, our study examines a single grassland measure in Germany using stated preferences. While the labelled design and links to the actual marketplace likely improved perceived realism, they do not guarantee transferability of the results to other study contexts. Preferences may differ in other regions, for arable measures, or when real stakes and learning about private schemes unfold over time. To strengthen external validity, future work should triangulate methods: (i) link survey responses to revealed behaviour on operational platforms or pilots (actual enrolment, certificate sales, certificate price setting behaviour); (ii) run incentivised or consequential choice tasks or field experiments that vary contract features and risk sharing; (iii) use longitudinal follow-ups to compare stated intentions to subsequent participation; and (iv) complement preference elicitation with qualitative debriefs to unpack perceived risk, advisory quality, and contract-source beliefs.

Future research should also examine additional behavioural factors influencing privately financed measures, including social norms and project visibility. Since private financing is relatively new to many German farmers, early adopters could play a key role in encouraging broader participation. Experimental evidence from public goods games suggests that greater first-mover contributions increase overall participation (Rommel et al. 2022). Understanding whether similar dynamics apply to privately financed contracts would be valuable.

Our empirical specification captures both identity-driven preference heterogeneity and potential utility losses from identity misalignment. Nevertheless, fully disentangling these mechanisms requires outcome variables beyond stated preferences, such as measures of emotional discomfort, behavioral inconsistencies or qualitative insights. We suggest this as a promising

direction for future research to deepen understanding of the interplay between identity, preference formation and decision-making in agri-environmental policy contexts.

Finally, while our findings indicate that contract design features had little impact on land enrolment decisions, this does not mean they are irrelevant. Further research should explore alternative incentive mechanisms, such as progressive payments for land enrolment or rewards for achieving threshold enrolment rates (Banerjee et al. 2021; Bouma et al. 2020; Kuhfuss, Préget, Thoyer, and Hanley 2016; Rommel et al. 2022), to enhance participation in agri-environmental contracts.

## 6 | Conclusion

This study provides valuable insights into the factors influencing farmers' preferences for privately financed agri-environmental contracts in Germany. The findings underscore the significant role of farmer identity in shaping contract preferences and land enrolment. Farmers demonstrate a clear preference for public government-funded and practice-based contracts, indicating a general risk aversion when it comes to privately financed or result-based agreements. The influence of the 'good farmer' identity further highlights the diversity in farmer motivations, with productivist farmers showing greater reluctance to participate in agri-environmental contracts unless compensated at higher rates. In contrast, environmentalist and civic-minded farmers are more likely to engage in these measures, reflecting their alignment with sustainable and community-focused agricultural practices. The study suggests that for privately financed agri-environmental contracts, in particular crowdfunding-based contracts, to gain wider acceptance, it is crucial to address the perceived risks associated with these contracts. Introducing co-financing mechanisms, enhancing transparency, and leveraging the experiences of pioneering farmers could help build trust and encourage broader participation. Future research should continue to explore the complex interplay between economic incentives, behavioural factors, and identity in the adoption of agri-environmental contracts. Additionally, expanding the scope to include various types of environmental measures will be essential for developing effective and inclusive agri-environmental policies.

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### Conflicts of Interest

The authors declare no conflicts of interest.

### Data Availability Statement

The data that support the findings of this study are openly available in OSF at [https://osf.io/ykv3q/?view\\_only=bd3ab5fb4dee4098b33476d823d1f12b](https://osf.io/ykv3q/?view_only=bd3ab5fb4dee4098b33476d823d1f12b).

### Endnotes

<sup>1</sup> <https://agora-natura.de/>.

<sup>2</sup> For more detail please visit <https://agora-natura.de/aktuelle-angebote/>.

<sup>3</sup> <https://www.project-contracts20.eu/>.

<sup>4</sup> A detailed explanation of that procedure can be found here.

<sup>5</sup> Moreover, a between-subject design with split samples was used to assess risk preferences regarding result-based payments. External factors (e.g., climate, weather) varied from 10% to 30%, but no significant differences emerged between groups. Consequently, this paper pools the samples and focuses on farmer contract preferences and identities rather than external factors. Details of the pre-registered experimental design can be found here: <https://osf.io/pvmxn>.

<sup>6</sup> A replication package of the analysis can be found here.

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### Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Data S1:** jage70011-sup-0001-DataS1.zip.

## Appendix A

### 'Good Farmer' Statements

TABLE A1 | 'Good farmer' indicator statements and factor loadings.

No.	A good farmer is one who	Factor 1	Factor 2	Factor 3
		'Environmentalism'	'Productivist'	'Civic minded'
1	... checks before applying pesticides to the fields whether it is necessary at all	0.56	0.09	-0.05
2	... prioritises the long-term preservation of ecological resources over short-term gains	0.55	-0.25	0.07
3	... sees it as their responsibility not to pollute waters flowing through or along their areas	0.66	-0.08	0.12
4	... minimises soil erosion	0.70	0.10	0.01
5	... minimises nutrient runoff into waterways	0.61	0.00	0.03
6	... maintains or increases organic soil content	0.62	0.19	-0.03
7	... thinks beyond their own operation and considers the social and ecological concerns of the surroundings	0.55	-0.14	0.31
8	... minimises the use of pesticides/fungicides	0.57	-0.13	0.11
9	... reduces income fluctuations	0.28	0.43	-0.02
10	... cares about both profitability and minimising environmental impact	0.62	0.06	0.10
11	... has the highest yield per hectare	-0.14	0.72	0.02
12	... is willing to try new practices and approaches	0.50	0.00	0.22
13	... prioritises field management	0.09	0.55	0.03
14	... maximises potential government payments	0.06	0.33	0.23
15	... has the highest profit per hectare	-0.08	0.72	-0.02
16	... uses the latest seed and chemical technology	-0.09	0.43	0.21
17	... has the latest equipment	-0.07	0.37	0.37
18	... shares knowledge with other farmers	0.25	0.05	0.34
19	... keeps their fields clean	0.06	0.58	-0.02
20	... avoids ploughing in the fall	0.29	-0.10	0.29
21	... is a doer in their community	0.02	0.22	0.57
22	... plans and implements measures with other farmers to protect groundwater	0.45	-0.04	0.43
23	... shares machinery and equipment with friends and neighbours	0.15	0.00	0.41
24	... keeps fence strips free from brush	-0.03	0.37	0.03
25	... minimises soil tillage	0.46	0.09	0.19
26	... is active in agricultural organisations	0.03	0.15	0.59
27	... ensures that agricultural areas look good from the road	-0.04	0.35	0.22
28	... uses cover crops between harvest and sowing	0.38	0.06	0.29
29	... helps friends and neighbours with agricultural tasks	0.15	0.02	0.29
30	... preserves habitat for wildlife	0.57	-0.15	0.25
31	... is active in their community	0.09	0.07	0.60

## Appendix B

### Cheap Talk Script

'In this type of survey, it is often observed that some farmers tend to either overestimate or underestimate their willingness to participate in the measures. This results in them choosing alternatives that they would not actually prefer in real life. It is important that your decisions here are realistic. Therefore, we ask you to carefully consider in each of the following election scenarios whether you are actually willing to enter into the corresponding contracts with the associated payments. Even if you have reservations about the proposed contracts, we still ask you to deliberately examine all options and, if necessary, choose "no contract" for each one and continue to answer the questionnaire so that we obtain a representative result that also captures critical perspectives.'

## Appendix C

### Introductory Text

The entire text within the introductory choice card reads the following:

You will be asked to choose from three alternatives for your described area. You can choose between a state-funded option, a privately funded option, or neither of the two.

For each contract, you will be asked to consider the following characteristics and their different variations.

### Payment Criteria for the Support Measure

The remuneration of the support measures is based either on the execution of specific practices (practice-based) or on the achievement of predefined results (results-based).

Currently, state programs predominantly use a practice-based approach. This means that farmers are paid for implementing predefined measures. These required measures are known and clearly defined before the contract is signed. In other words, farmers have limited flexibility in implementation. However, the risk of failing to meet the contract requirements and thus not receiving payment is lower than with results-based support measures.

With results-based remuneration, on the other hand, farmers are not paid according to strict regulations but for achieving specific results. These results are measured using indicators, which may be based on the number and diversity of verified indicator species.

As part of this survey, under results-based remuneration, the protected grassland area must contain six different indicator plant species along its diagonal.

In contrast to practice-based remuneration, specific management measures can still be adjusted after the contract is signed. This provides farmers with high flexibility in implementing measures. However, the

risk of not fulfilling the contract and therefore not receiving payment is higher compared to practice-based contracts.

### Involvement of Contract Partners

In current agri-environmental measures and nature conservation projects, farmers deal directly with the payment authorities.

However, there are now approaches in Germany where a responsible measure provider (intermediary) acts as a contractual partner. These intermediaries can include foundations, landscape conservation associations, representatives of nature reserves, biological stations, etc. These contract partners take over much of the administrative work related to implementing measures and are responsible for executing the measures on behalf of the funders.

In the state-funded model, this could mean that farmers are represented by an intermediary organisation. An example of this is the cooperative model used in the Netherlands, where multiple farmers collaborate to achieve a common environmental goal. The cooperative then acts as the direct contact with the payment authority.

Similarly, within the AgoraNatura framework, contracts can be concluded directly between farmers and funders, or an intermediary may be included as a contractual partner. In this case, the farmers would enter into a contract only with the intermediary.

### Provision of Advisory Services

Successful implementation of nature conservation measures requires making numerous decisions. These decisions involve selecting appropriate locations and measures, as well as intervening when measures do not go as planned. Farmers can consult advisors for support.

Especially in results-oriented projects, where uncertainties exist and external factors can influence success, conservation advisors can help reduce the risks of failure. Farmers are free to choose whom they consult for advice. For the contracts considered, the following options are available:

- The contract includes advisory services.
- The contract does not include advisory services, and farmers must arrange consultations independently if necessary.

### Premium

Participants receive an annual premium for implementing the measures, which can vary depending on the contract's design. In state-funded measures, the premium is predefined and paid in Euros per hectare per year. Within AgoraNatura, premium amounts can theoretically be set individually, but for this survey, they are provided as examples.

The premium range is 350–850 Euros/ha/year.

	Staatlich finanziert	Privat finanziert
Ziel der Fördermaßnahme	Maßnahmenorientiert	Maßnahmenorientiert
Einbindung von Vertragspartner	Mit verantwortlichen Maßnahmenträger	Ohne verantwortlichen Maßnahmenträger
Beratungsleistungen	Inklusive Beratung	Inklusive Beratung
Prämie	710 €/ha/Jahr	650 €/ha/Jahr

**Prämie**  
Für die Umsetzung der Maßnahmen wird den Teilnehmenden eine jährliche Prämie ausbezahlt, welche je nach Ausgestaltung unterschiedlich hoch sein kann. Diese wird bei staatlichen Maßnahmen vorgegeben und erfolgt in Euro pro ha und Jahr. Im Rahmen von AgoraNatura können die Prämienhöhen zwar prinzipiell selbst festgelegt werden, werden aber für unsere Umfrage beispielhaft angegeben.  
Die Spanne der Prämienhöhe beläuft sich auf 350 – 850 Euro/ha/Jahr

Welchen Vertrag würden Sie auswählen?  
 Staatlich finanziert  Privat finanziert  kein Vertrag

FIGURE A1 | Introductory choice card. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

## Appendix D

### Distribution of Factor Scores

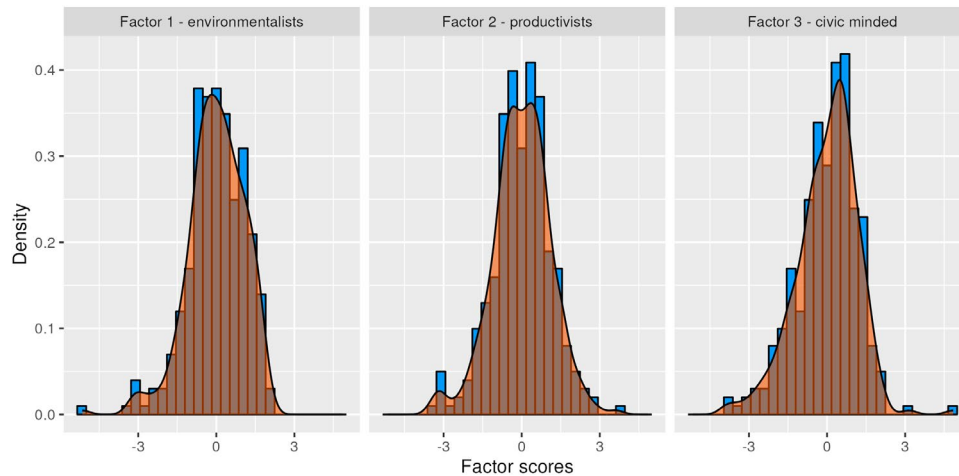


FIGURE A2 | Distribution of factor scores. [Colour figure can be viewed at [wileyonlinelibrary.com](http://wileyonlinelibrary.com)]

## Appendix E

### Variables Used in Analysis

TABLE A2 | Variables used in analysis.

Variable	Description	Coding/Range
<i>Contract attributes</i>		
Payment mechanism	Payment criteria of the agri-environmental contract	Practice based, Result based Binary (0 = Practice based, 1 = Result based)
Contract partners	Option to involve partners in the contract and implement measure cooperatively	None, cooperative Binary (0 = none, 1 = cooperative)
Advisory services	Option to have advisory services included in the contract	None, inclusive Binary (0 = none, 1 = inclusive)
Compensation	Compensation payments per hectare	350–830 Euros/ha/year 8 equally-separated levels
<i>Contract interactions</i>		
F1 'Environmentalist' F2 'Productivist' F3 'Civic-minded'	Factor scores capturing relationship with respective factor	Bartlett scores with mean 0 and SD 1; range from –4 to +4
<i>Enrolment decision</i>		
mlee1 mdmf02 mdmf03 mdmf11 mdmf12 mdmf13	Error correction terms to account for potential endogeneity of extensive and intensive margin decision	Terms are computed based on conditional choice probabilities from the DCE (Bourguignon et al. 2007)

## Appendix F

### Opt Out Debriefing

Reason	<i>N</i>
Someone else should carry out nature conservation (yes)	87
No	73/87 (84%)
Yes	14/87 (16%)
The compensation amount was not sufficient (yes)	87
No	66/87 (76%)
Yes	21/87 (24%)
I have already done a lot for nature conservation in the past (yes)	87
No	59/87 (68%)
Yes	28/87 (32%)
There was not enough information available (yes)	87
No	69/87 (79%)
Yes	18/87 (21%)
The measure does not fit into my farm operations (yes)	87
No	36/87 (41%)
Yes	51/87 (59%)