Farmers' Attitudes toward the Future of Direct Payments: An Empirical Study from Germany

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Abstract

The new Common Agricultural Policy (CAP) reform has met with large-scale protests from farmers throughout Europe, intending to change one of the most controversial components: direct payments. We analyze German farmers' attitudes and understanding of direct payments. The study employs a survey of 435 farmers collected from January to February 2021. Using cluster analysis and quantitative content analysis, we identified three distinct groups: (1) The "Independents" (43.7%) are entrepreneurs and have a competitive mindset. They would prefer to abolish direct payments associated with more freedom from policy conditions. (2) The "Conservatives" (27.0%) advocate an income policy based on direct payments, and they reject higher environmental standards. (3) The "Environmentalists" (30.3%) emphasize a pronounced environmental awareness, favoring an environmentally performance-based approach. The results show that policies are often perceived differently than they are intentionally designed. Improving the effectiveness of the policy measure requires sufficient information about the CAP's objectives for farmers, focusing on more transparent communication strategies. From a policy perspective, a more differentiated design of policy instruments and longer transformation periods are needed to engage farmers in policy change.

Keywords

direct payments; farmers' attitudes; Common Agricultural Policy; factor analysis; cluster analysis

1 Introduction

Discovering a balance between societal demands for high environmental quality and the farm income policy is a key issue in the Common Agricultural Policy (CAP) design. The new reform paves the way for a "greener" and "fairer" development of the CAP (EU COM, 2021). The Farm-to-Fork Strategy is one strategy within the European Union (EU) that fosters a vision for contributing to biodiversity, reducing agrochemical use, and limiting the ecological footprint of agriculture. Farmers are key actors in this context by affecting the environment and natural resources (EU COM, 2020a). The transition toward higher environmental standards entails changes in the direct payment scheme, including a reduction of basic payments paid per hectare (ha) of cultivated land.

What politicians call a "milestone" (EU2020, 2020) drives farmers onto the streets. Recent large-scale farmer protests in Germany and other European countries are calling against implementing enhanced environmental standards such as the new fertilizer ordinance or reducing direct income support associated with increasing existential uncertainties for farms (AGRARHEUTE, 2021; HEINZE et al., 2021). This reflects the unprecedented tension between the established policy and farmers' interests, indicating the fundamental problem of balancing policy design. To shed light on farmers' situation within the process of policy reform and to engage them in policy change, investigating and understanding farmers and their perspectives is a crucial prerequisite. Attitude is closely linked to intentions and behavior (AJZEN, 1991), which are useful insights for developing policy measures.

Previous studies examining farmers' perspectives on income support concentrate on drivers affecting the adoption of environmental measures conditional on direct payments (ZINNGREBE et al., 2017; SCHÜLER et al., 2018; BROWN et al., 2021) using a qualitative survey design. Others analyze farmers' acceptance of alternative income tools (MÖLLMANN et al., 2019), their dependence on direct payments (MICHELS et al., 2020), or capture farmers' attitudes toward the environmentally-oriented development of policy design (FEINDT et al., 2021). Direct payments are essential for most farmers' agricultural income (MICHELS et al., 2020), and farmers respond differently to an environ-

DOI: 10.30430/gjae.2023.0268

mentally-oriented CAP design. FEINDT et al. (2021) find groups of farmers who reject a more ecological development, favor an income policy that primarily protects natural resources, or prefer more market-oriented instruments. However, most of these studies rely on samples not representative of the German farming population concerning farm characteristics and use relatively small samples (MICHELS et al., 2020; FEINDT et al., 2021) or do not differentiate between farmer typologies (MICHELS et al., 2020). As a result, a comprehensive picture of farmers' perspectives and the generalizability of typologies of farmers are limited.

Therefore, the paper analyzes the typologies of farmers based on their attitudes toward the future of direct payments and their perceptions of direct payments using cluster analysis and quantitative content analysis. We aim to understand better farmers' attitudes toward the development of the direct payment scheme to generate insights into likely responses to the upcoming reform. Since direct payments are paid per ha, we consider the farm size as one crucial aspect in examining farmers' attitudes toward direct payments. Therefore, the sampling procedure includes a quota-controlled sampling method based on an official national statistic (FDZ, 2016) for a representative sample of the German farming population.

The remainder of the paper is organized as follows. Section 2 provides information on the objectives and structure of the CAP. Section 3 describes the survey approach and the methods used for analysis. Section 4 presents the results, and Section 5 discusses the results and draws conclusions.

2 Objectives and Structure of the CAP

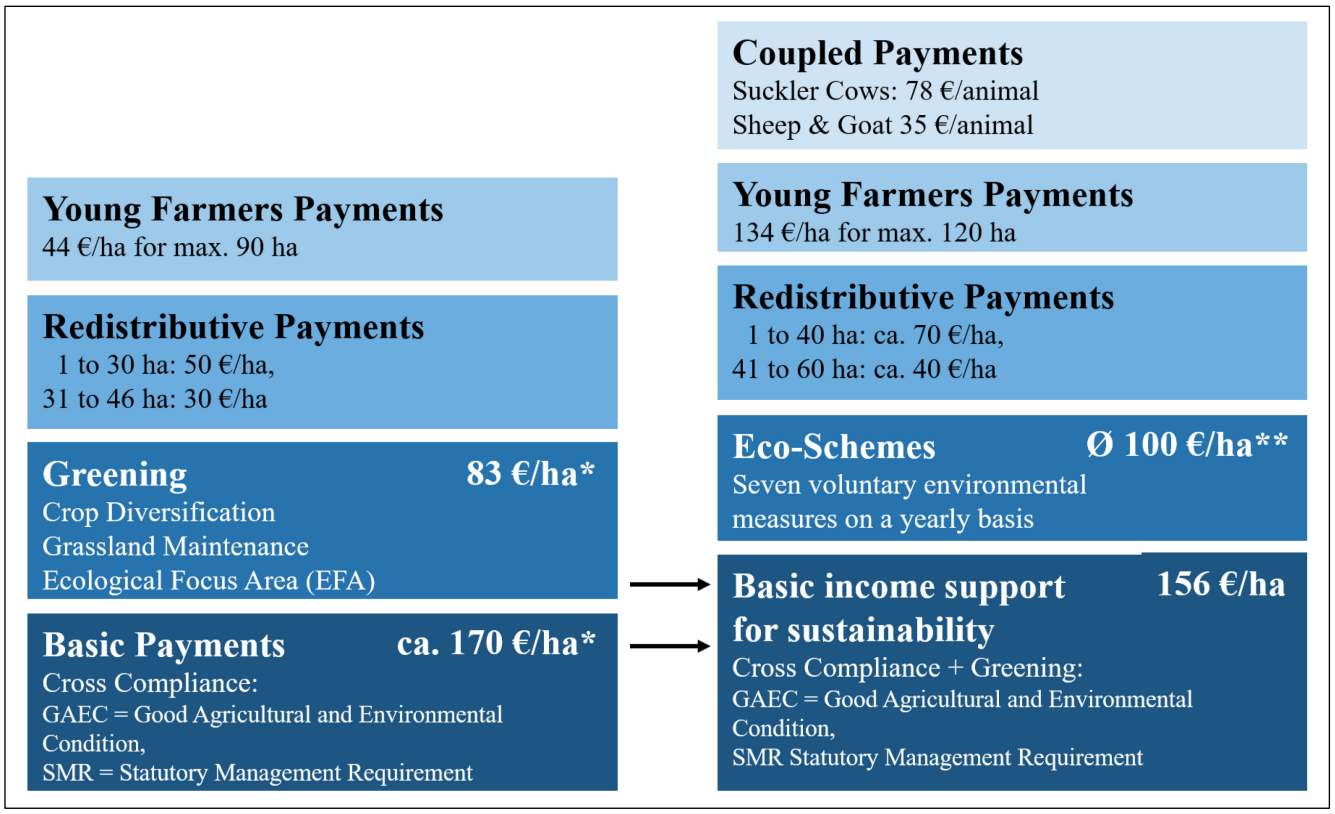
Direct payments, which account for around 70% of total CAP spending, are by far the most important agricultural policy instrument implemented in the EU. Currently, direct payments pursue "income objectives", as stated in article 39 of the treaty of Lisbon: "The objectives of the common agricultural policy shall be, […] b) thus to ensure a fair standard of living for the agricultural community, in particular by increasing the individual earnings of persons engaged in agriculture." (EU COM, 2012). Adding to this, the EU Commission formulated a set of three new objectives ahead of the reform 2021: In the strategy-plan regulation, article 5 states "support from the EAGF and the EAFRD shall aim […] b) to support and strengthen environmental protection, including biodiversity, and climate action […]" (EU COM, 2021). Therefore, direct payments pursue a set of multifunctional objectives. PE'ER et al. (2019, supplementary material) show that some of these objectives are partly conflicting due to the design and implementation of direct payments. From 2014-2020 and the transition years 2021 and 2022, direct payments consist of the Basic Payment Scheme, Greening, the Redistributive Payment Scheme, and the Young Farmer Scheme. In the course of the last CAP Reform 2021, the environmental measures of the Eco-Schemes and Coupled Payments were added and Greening and the former basic payments were transformed into the "basic income support for sustainability" (Figure 1).

2.1 Stabilizing Farm Incomes

As an income stabilization instrument, farmers receive basic payments (per ha) that reduce farm income volatility and improve farmers' resilience to unexpected income shocks from either production or price variability (EU COM, 2018). From 2016 to 2020, on average, 24% of European farmers' agricultural income came from direct payments. Germany's average share of direct payments stood at more than 30% (EU COM, 2022). Thus, direct payments account for a large proportion of farmers' incomes. However, lowering income variability is more substantial in farms receiving relatively high direct payments and not necessarily facing the most considerable income variability (SEVERINI et al., 2016).

In addition, the distribution of payments shows that most support is concentrated on higher-income farms (SCOWN et al., 2020). In 2020, 2% of European farms receiving more than 50,000 EUR took a share of 27.5% of all payments (EU COM, 2020b), indicating a distribution beneficial for larger farms. With the last reform, the Redistributive Payment Scheme with up to 30% of the national ceiling for direct payments was introduced to grant extra payments for the first ha, thus, providing a higher average rate per ha for smaller farms. However, PE'ER et al. (2019) reveal that in the past, the redistributive measures have not affected the distribution of direct payments throughout the EU. Furthermore, BALMANN and SAHRBACHER (2014) indicate that the redistributed funds are not sufficient for farms to remain competitive over a longer period. Whether the increase of redistributing payments in 2023 could solve the issue of missing farm competitiveness in the longer perspective, is still questionable.

Figure 1. Direct payment scheme in the CAP 2014-2020, the transition years 2021 and 2022, and the CAP 2023-2027 in Germany



*Payment levels within the CAP 2014-2022 refer to the year 2022; **Payments for Eco-Schemes (ES) are specific for each measure. The average of 100 €/ha refers to the budget for ES divided by the indicated area for ES.
Source: BMEL (2015), BLE (2022)

Lastly, it is argued that farmers are not the primary beneficiaries of income support payments. Even though the last reform (2013) focused on limiting payments to active farmers, farmers still capture only a proportion of direct payments (MATTHEWS, 2017). Support benefits are divided into higher land rents or land values, which benefit landowners and other input suppliers who are not necessarily farmers (HENNING and BREUSTEDT, 2018). For Germany, HENNING and BREUSTEDT (2018) calculated that for one Euro of support paid for eligible farming land, the land rent increases by 0.87 EUR to 0.94 EUR. This reduces direct payments' income benefits and raises entry and growth costs for younger and expanding farmers (BRADY et al., 2017). Hence, direct payments can negatively affect farms' competitiveness and the sector's renewal (MATTHEWS, 2017).

2.2 Fostering Sustainable Development and Management of Natural Resources

In 2003, direct payments were made conditional upon a set of basic regulatory requirements for farming, animal husbandry, and the environment (cross-compliance), consisting of the statutory management requirements (SMR) and the standards for the good agricultural and environmental condition for land (GAEC). Several of these requirements are also part of national legislation, non-compliance comes with a loss of direct payments and a fine according to the ordinal law.

A second element was introduced in 2013, attempting to link direct payments to more beneficial practices for the environment. The Greening payments tied 30% of direct payments to crop diversification, ecological focus areas, and the maintenance of permanent grassland to incentive farmers to preserve natural resources and provide public goods. However, Greening measures' design is criticized for failing to achieve ecological goals and protect biodiversity (PE'ER et al., 2014, 2017; BROWN et al., 2021). Small changes in environmental indicators, including nutrient surpluses, crop diversity, erosion, and greenhouse gas emissions, have been observed (LOUHICHI et al., 2018). As a result, the Greening component is a relatively ineffective policy instrument for affecting environmental outcomes (ECA, 2020). Furthermore, farmers' uptake of environmental management practices eligible for biodiversity support under Greening conditions has

been limited (PE'ER et al., 2017). Farmers' motivation to implement environmental measures relies on personal and financial incentives (HOME et al., 2014), and farmers consider Greening a costly constraint (SCHULZ et al., 2014).

In the new CAP, higher environmental standards are created by combing cross-compliance with Greening. Additionally, 23% of direct payments are linked to eco-schemes, including seven voluntary practices, rewarding those farmers who manage land in an environmental- and climate-friendly way. As a result, the basic payment provision will be reduced from 2023, while farmers will be compensated by adopting eco-schemes (BLE, 2022). At the same time, the level of redistributive payments and payments for young farmers will be increased for a fairer distribution of income support. Thus, farmers have to deal with several policy changes in the income policy system, which require more environmental ambitions and performance to receive income support. Whether a typology of farmers can be distinguished regarding their attitudes toward the changes in the direct payment scheme will be examined in the following.

3 Data and Method

3.1 Survey Design

To survey farmers' attitudes toward direct payments, we carried out a standardized survey[1] from January to February 2021. After pretesting the survey on 15 selected farmers, a survey company[2] was assigned to recruit farmers for the main sample and conduct the interviews, using Computer Assisted Web Interviews (CAWI), and Computer Assisted Telephone Interviews (CATI). To obtain a representative sample for the characteristics of farm size and regional distribution of the farms, the main sample was randomly selected using a quota-controlled sampling method[3] based on the German Land Use Survey (FDZ, 2016). The Interview process continued until the quotas were fulfilled and 500 farmers were interviewed. After excluding observations with missing values, we obtained 435 valid questionnaires for further analysis. Missing data were not substituted since there was no systematic pattern of reliable, comparable data to replace them (BACKHAUS and BLECHSCHMIDT, 2009).

Statements of the questionnaire were designed following relevant literature on behavioral economics related to income support and environmental behavior (ZINNGREBE et al., 2017; SCHÜLER et al., 2018; MICHELS et al., 2020; FEINDT et al., 2021) by considering the changes of the new CAP reform. Responses to the attitudinal section were on a five-point Likert scale, from (1) = strongly disagree to (5) = strongly agree. An open-ended question captures farmers' perspectives on the future of direct payments. Socio-demographic data and farm characteristics were also collected (table 1).

3.2 Data Analysis

First, we conducted an explorative factor analysis to capture the central dimensions of farmers' attitudes. To extract factors, we used Principal Component Factor Analysis and varimax rotation. Then, we applied the Kaiser-Meyer-Olkin Criterion (KMO $\geq$ 0.5), Bartlett's test of sphericity, and the criterion for reliability (Cronbach's alpha: C$\alpha \geq$ 0.6) to test the quality of the questionnaire and the variables' suitability for the analysis (BACKHAUS et al., 2016).

Second, we used the hierarchical clustering technique to identify homogeneous groups of farmers with similar attitudes based on the extracted factors. The similarity is defined in terms of the distance between objects. The cluster number is chosen based on a dendrogram, Ward's method, and the Duda/Hart criterion. Prior, the single-linkage method was used to identify and eliminate outliers. Hierarchical cluster analysis results are then compared with k-means clustering and tested for robustness using canonical discriminant analysis. Lastly, to characterize the clusters and prove significant differences among groups, we conducted one-way ANOVA and post hoc estimations assuming no equality of variance (BACKHAUS et al., 2016).

Finally, we conducted a quantitative content analysis to examine farmers' attitudes toward the future of direct payments within each cluster in more depth. We used an open-ended question to explore the variability of farmers' responses because it was impossible to delimit the subject of inquiry beforehand. We first developed a categorization scheme that

[1] Funded by the University of Göttingen and the University of Rostock.

[2] The survey company has more than 42,000 addresses. Farmers' addresses are collected by recruiting via phone or e-mail.

[3] Regardless of CATI or CAWI, farmers' addresses were randomly selected. First, farmers were contacted via e-mail to participate in the survey. Farmers who did not respond were contacted by telephone. Then, farmers could choose to complete the interview over the phone or online.

describes the relevant coding categories directly derived from the textual data. Then, each category is assigned a label, followed by a category definition and examples (BORTZ and DÖRING, 2016). Lastly, farmers' responses are analyzed comparatively to emphasize the differentiation within the clusters.

4 Results

4.1 Sample Description

Table 1 shows the sample's socio-demographic variables compared to the German farmers' population. The sample (n = 435) comprises 94% male and 6% female farmers with an average of 53 years. The samples' educational level is above the average for German farmers, as 21% hold a university degree (GERMAN FARMERS' ASSOCIATION, 2021/2022). Approximately two-thirds of the sample have farming as their primary occupation, while 32% work part-time in agriculture. In addition, 81% of the farms are conventional, and 19% farm organically, of which 44% are engaged in livestock production. The sample consists of 59% small farms with less than 50 ha, 22% have a farm size of 50 to 100 ha, and 19% are large farms (more than 100 ha). Most farms (49%) are located in Southern Germany, 39% are in the North-West region, and 12% are situated in Eastern Germany, which corresponds to the German average (FDZ, 2016).

Table 1. The sample's socio-demographics compared to the German farmers' population

Sample characteristics	Sample (n=435) (in%)	German farmers' population (in%)
Sex		
Male	94	90[a]
Female	6	10[a]
Age		
Average age	53	53[b]
Under 45 years	21	25[b]
Over 55 years	48	40[b]
Level of education		
Only practical experience	2	33[b]
Vocational training	77	53[b]
University degree	21	14[b]
Occupation		
Full-time	68	46[b]
Part-time	32	54[b]
Type of farming		
Conventional	81	87[b]
Organic	19	13[b]
Livestock production	44	64[c]
Farm size		
<50 ha	59	62[d]
50-100 ha	22	19[d]
>100 ha	19	15[d]
Regions		
[1]North-West	39	38[d]
[2]South	49	51[d]
[3]East	12	11[d]

[1]North-West = Lower-Saxony, Schleswig-Holstein, North Rhine-Westphalia
[2]South = Baden-Württemberg. Bavaria, Rhineland-Palatinate, Hesse, Saarland
[3]East = Saxony, Saxony-Anhalt, Thuringia, Brandenburg, Mecklenburg-West Pomerania
Source: own estimates. [a]EUROSTAT (2020), [b]GERMAN FARMERS' ASSOCIATION (2021/2022), [c]DESTATIS (2021), [d]FDZ (2016)

4.2 Results of Factor Analysis

Based on factor analysis conducted to reduce the dimensionality of variables, 12 variables representing farmers' attitudes toward direct payments are grouped into three factors (Table 2). A Kaiser-Meyer-Olkin statistic value of 0.73 and the Bartlett Test of Sphericity with a p-value of 0.000 indicate that the variables are applicable for factor analysis. The first factor, 'environmental requirements', relates to farmers' attitudes toward ecological conditions on direct payments. The second factor describes farmers' perception of direct payments, including their (dis-)contentment with these payments. Finally, the third factor relates to farmers' perceived financial dependence on income support.

Farmers are divided on whether premiums should be linked to environmental services rather than the agricultural area (μ = 0.08). 38% are in favor, and 36% are in opposition. Almost 60% disagree with reducing direct payments and 52% assess climate and environmental protection requirements as restrictive for their future farming plans. Furthermore, farmers are divided on whether their farm offers little scope for more environmentally friendly farming methods (μ = 0.04). In addition, more than 50% disagree that farmers should be allowed to maximize their income irrespective of environmental consequences. Regarding farmers' perception of direct payments, 60% disagree that direct payments guarantee fair incomes in agriculture[4], and 33% think that

[4] In the EU Treaties, the concept of "fair incomes" in agriculture is not clearly defined. Thus, farmers may have different ideas what a fair income means.

Table 2. Results of factor analysis and descriptive analysis

Factors and statements	Agreement[1] (%)	Neither-nor (%)	Disagreement[1] (%)	Factor loadings
Environmental requirements (ER) (Cα=0.71)				
ER1 = Premiums should be linked to environmental services rather than the agricultural area. (μ=0.08; σ=1.41)	37.7	26.4	35.9	-0.7790
ER2 = Reducing direct payments to strengthen and protect the environment is reasonable. (μ=-0.63; σ=1.36)	23.0	18.4	58.6	-0.7622
ER3 = My farm offers little scope for additional climate-friendly farming methods. (μ=0.04; σ=1.20)	34.3	34.3	31.5	-0.5738
ER4 =Additional climate and environmental protection requirements impose too many restrictions on my future farming plans. (μ=0.44; σ=1.32)	52.0	20.5	27.6	0.7723
ER5 = Farmers should be allowed to maximize their income irrespective of environmental consequences. (μ=-0.43; σ=1.45)	29.4	18.4	52.2	0.5600
Perception of direct payments (PDP) (Cα = 0.61)				
PDP1 = Area-based direct payments guarantee fair incomes in agriculture. (μ=-0.66; σ=1.25)	19.8	20.2	60.0	0.6977
PDP2 = Farmers should not receive direct payments per ha. (μ=-0.19; σ=1.51)	33.1	21.6	45.3	-0.6173
PDP3 = I am content with the current direct payment system of the CAP. (μ=-0.44; σ=1.07)	23.0	30.8	46.2	0.7565
PDP4 = Direct payments are working for the welfare of farmers and the sector. (μ=-0.07; σ=1.41)	38.2	21.6	40.2	0.5232
Dependence on direct payments (DDP) (Cα=0.61)				
DDP1 = Despite positive profit contributions, I need direct payments to receive an adequate income. (μ=1.04; σ=1.27)	74.0	12.2	13.8	0.8403
DDP2 = I would be willing to use direct payments to compensate for gross margins. (μ=0.42; σ=1.36)	55.2	21.4	23.5	0.5293
DDP3 = I can keep my farm running even without receiving direct payments. (μ=-0.47; σ=1.47)	29.0	17.5	53.6	-0.8029

Loadings >0.5 are presented after varimax rotation. Kaiser-Meyer-Olkin: 0.73, Bartlett's Sphericity Test: p = 0.000; explained variance = 51.3%; n = 435; **bold** = factors. [1]Scale from +2 = "Strongly agree" to -2 = "Strongly disagree". Agreement is summarized by "strongly agree" and "moderately agree". Disagreement is summarized by "moderately disagree" and "strongly disagree". μ = mean; σ = standard error.
Source: own calculation

farmers should not receive direct payments. In addition, 46% are discontent with the current direct payment system, and 40% disagree that direct payments work for farmers' welfare and the sector (μ = -0.07). Most farmers believe that direct aid is imperative to their agricultural income (74%), and 55% would use direct payments to compensate for negative gross margins. Lastly, 54% think receiving direct payments is necessary to maintain their farming activities.

4.3 Results of Cluster Analysis

The three factors determined by the factor analysis are used as cluster-building variables to differentiate farmers into groups. A three-cluster solution was chosen using Ward's method in conjunction with the highest Duda/Hart index (0.8977) (Table 3). The discriminant analysis shows that 85% of farms were correctly classified, proving an acceptable result (BACKHAUS et al., 2016).

Cluster A - Independents

Farmers in Cluster A, the biggest cluster (n = 185; 42.7%), are more discontent with the current direct payment scheme than the rest of the sample. They moderately agree that climate and environmental protection requirements are restrictive for their future farming plans. At the same time, they think that direct payments do not guarantee fair agricultural incomes and work for farmers' welfare. They are indecisive about whether their farm offers little scope for additional eco-friendly farming methods or whether farmers should not receive direct payments. However, the positive sign of the last statement indicates a relatively favorable attitude (μ = 0.29). Regarding their financial situation, farmers assess themselves as less dependent

Table 3. Results of the cluster analysis

Variables and statements[1]	Cluster A (n=185)	Cluster B (n=117)	Cluster C (n=131)	Total (n=433[2])
Environmental requirements* **	**0.05^{bc} (.55)**	**0.87^{ac} (.44)**	**-0.83^{ab} (.73)**	**0.01 (.87)**
Premiums should be linked to environmental services rather than the agricultural area.***	-0.21^{bc} (1.36)	-0.85^{ac} (.95)	1.23^{ab} (.93)	0.06 (1.40)
Reducing direct payments to strengthen and protect the environment is reasonable.***	-1.07^{c} (1.12)	-1.29^{c} (.91)	0.59^{ab} (1.18)	-0.63 (1.35)
My farm offers little scope for additional climate-friendly farming methods.***	0.24^{c} (1.12)	0.53^{c} (1.10)	-0.66^{ab} (1.04)	0.05 (1.19)
Farmers should be allowed to maximize their income irrespective of environmental consequences.***	-0.06^{c} (1.39)	0.03^{c} (1.51)	-1.31^{ab} (1.00)	-0.41 (1.45)
Additional climate and environmental protection requirements impose too many restrictions on my future farming plans.***	0.99^{c} (1.06)	0.87^{c} (1.03)	-0.88^{ab} (1.00)	0.39 (1.33)
Perception of direct payments * **	**-0.69^{bc} (.91)**	**0.25^{ac} (.63)**	**0.75^{ab} (.71)**	**0 (1.00)**
I am content with the current direct payment system of the CAP.***	-0.65^{b} (1.09)	-0.01^{ac} (.95)	-0.43^{b} (1.08)	-0.41 (1.08)
Direct payments are working for the welfare of farmers and the sector.***	-0.61^{bc} (1.23)	0.91^{ac} (1.10)	-0.04^{ab} (1.33)	-0.02 (1.37)
Area-based direct payments guarantee fair incomes in agriculture.***	-1.18^{bc} (.98)	0.26^{ac} (1.25)	-0.73^{ab} (1.14)	-0.65 (1.25)
Farmers should not receive direct payments per ha.***	0.29^{b} (1.43)	-1.27^{ac} (1.16)	0.01^{b} (1.38)	-0.22 (1.49)
**Dependence on direct payments ** **	**0.16^{b} (1.05)**	**-0.14^{a} (.80)**	**-0.11$^{n.s}$ (1.06)**	**0 (1.00)**
Despite positive profit contributions, I need direct payments to receive an adequate income.***	0.74^{b} (1.34)	1.72^{ac} (.61)	0.89^{b} (1.31)	1.05 (1.25)
I would be willing to use direct payments to compensate for negative gross margins.***	0.17^{b} (1.43)	0.74^{a} (1.25)	0.47$^{n.s}$ (1.23)	0.41 (1.34)
I can keep my farm running even without receiving direct payments.***	- 0.03^{b} (1.51)	-1.35^{ac} (.99)	-0.30^{b} (1.40)	-0.47 (1.46)

bold = clustering factors; significance level at *p ≤ 0.05; **p ≤ 0.01; ***p ≤ 0.001; numbers without parentheses: mean values; numbers within parentheses: standard derivations.$^{a\text{-}c}$Significant difference of the mean to the corresponding cluster (Tamhane post-hoc multiple comparison test at significance level α = 0.05). $^{n.s}$= not significant. [1]A five Likert-scale is used with -2 = Strongly disagree; -1 = moderately disagree; 0 = neither-nor; 1 = moderately agree; 2 = strongly agree. [2]Single-linkage method detected two outliers.
Source: own calculation

on direct payments (μ = 0.74) than Clusters B and C. Thus, farmers in Cluster A are identified as the "Independents".

Cluster B - Conservatives

Cluster B contains 117 farmers (n = 117; 27.0%) who oppose higher environmental standards within conditionality. They moderately disagree with reducing direct payments and linking premiums more closely to ecological services than the agricultural area. According to their perception of direct payments, farmers agree that direct aids work for farmers' welfare, and farmers should receive direct payments per ha. Additionally, they strongly agreed to need direct payments to secure their income and they could not keep their farm running without receiving direct payments. Compared to the rest of the sample, Cluster B is more willing to use income support to compensate for negative gross margins (μ = 0.74). Thus, farmers in this cluster favor a sectoral income policy, providing income support paid per ha eligible land and fewer environmental requirements. They perceive themselves as more dependent on direct payments than Clusters A and C. Thus, farmers in Cluster B are characterized as the "Conservatives".

Cluster C - Environmentalists

A pro-environmental attitude characterizes farmers in Cluster C (n = 131; 30.3%) as they agree that direct payments should be linked to environmental services and reduced to strengthen the environment. These farmers moderately disagree that their farm offers little scope for other environmental-friendly farming methods, and climate and environmental protection requirements constrain their future farming plans. They oppose that farmers should be allowed to maximize their income regardless of environmental consequences, and direct payments guarantee fair incomes. In addition, they moderately agree that they need direct payments to contribute to their income

regarding their financial situation. Farmers in this cluster advocate the CAP's green ambitions but do not express a strong attitude towards income support and their dependence on direct payments. Thus, farmers in Cluster C are identified as the "Environmentalists".

The profiles of the three clusters are depicted in Table 4. The results show significant differences in primary and secondary occupations, farm type, and regional distribution of farms. For example, Cluster A comprises significantly more farmers working full-time in agriculture than Cluster B. In addition, Cluster B has more farms located in Eastern Germany than Cluster A, and Cluster C contains considerably more organic farms than Clusters A and B.

In terms of farmers' understanding of direct payments, farmers across clusters are undecided about whether they receive direct payments even if they do not cultivate on the eligible land. This indicates that the term 'decoupled' payments for farmers' average seems rather ambiguous. Instead, the Conservatives believe that farmers receive direct payments due to their contribution to environmental protection, while Independents and Environmentalists are indifferent.

4.4 Results of the Quantitative Content Analysis

The following step categorizes and summarizes farmers' responses to highlight their attitudes toward the future of direct payments within the clusters. We

Table 4. Profiles of three clusters by means and frequencies

Variables	Independents (Cluster A) (n=185)	Conservatives (Cluster B) (n=117)	Environmentalists (Cluster C) (n=131)	Total (n=433)
Age (years)$^{n.s.}$	53.19 (10.39)	52.85 (11.16)	54.64 (9.25)	53.54 (10.28)
Male (binary)$^{n.s.}$	0.95 (.22)	0.96 (.20)	0.92 (.28)	0.94 (.23)
[1]Education (scale 1-3)$^{n.s.}$	2.19 (.42)	2.16 (.45)	2.23 (.47)	2.19 (.44)
Fulltime (binary)*	0.74^{b} (.44)	0.61^{a} (.49)	0.64 (.48)	0.68 (.47)
[2]Diversification (binary)$^{n.s.}$	0.29 (.46)	0.19 (.39)	0.24 (.43)	0.25 (.43)
Region				
[3]North$^{n.s.}$	85	40	45	170
[4]South$^{n.s.}$	88	58	67	213
[5]East*	12^{b}	19^{a}	19	50
Farm system				
Conventional farms***	163^{c}	103^{c}	67^{ab}	333
Farms with organic branches$^{n.s.}$	9	6	4	19
Organic farms***	13^{c}	7^{c}	55^{ab}	75
Farm converting to organic$^{n.s.}$	0	1	5	6
Farm size (ha)$^{n.s.}$	85.21 (215.34)	86.46 (120.51)	59.96 (67.38)	77.91 (158.61)
<50 ha	105	69	82	256
50-200 ha	69	36	41	146
>200 ha	11	12	8	31
Land tenure (ha)$^{n.s.}$	44.39 (133.27)	44.56 (78.80)	28.21 (40.71)	39.54 (98.93)
<20 ha	104	69	83	256
20-50 ha	43	22	24	89
>50 ha	38	26	24	88
Farmers receive direct payments even if they do not cultivate on the eligible land.$^{n.s.}$	0.17 (1.52)	-0.07 (1.45)	-0.15 (1.45)	0.01 (1.49)
Farmers receive direct payments because they contribute to environmental protection.***	0.34^{b} (1.35)	0.64^{ac} (1.20)	0.19^{b} (1.38)	0.24 (1.34)

Significance level at *p ≤ 0.05; **p ≤ 0.01; ***p ≤ 0.001; numbers without parentheses: mean values; numbers within parentheses: standard derivations; frequencies in integers. $^{n.s.}$= not significant. $^{a-c}$Significant difference of the mean to the corresponding cluster (Tamhane post-hoc multiple comparison test at significance level α = 0.05). Nominal scale: significance according to Chi-square. [1]The level of education is coded as follows: 1 = Graduation, 2 = Vocational training, 3 = University degree. [2]Besides arable farming and animal husbandry, farmers have at least two other sources of income. [3]North = Lower-Saxony, Schleswig-Holstein, North Rhine-Westphalia. [4]South = Baden-Württemberg. Bavaria, Rhineland-Palatinate, Hesse, Saarland. [5]East = Saxony, Saxony-Anhalt, Thuringia, Brandenburg, Mecklenburg-West Pomerania.
Source: own calculation

Table 5. Category system to describe farmers' attitudes toward the future of direct payments

Category	Statements (%)		
	Independents (Cluster A)[1] n=138	**Conservatives (Cluster B)[1]** n=78	**Environmentalists (Cluster C)[1]** n=91
Maintaining direct payments	9	36	8
Competitiveness	9	3	4
Fairness	35	33	31
Environmental protection and animal welfare	8	9	37
Deregulation	8	13	7
Abolishment of direct payments	31	6	13

[1]Statements analyzed for each cluster: Cluster A = 166; Cluster B = 94; Cluster C = 104. As some farmers have reported more than one statement, the number of statements exceeds the number of farmers within clusters.
Source: own calculation

conducted a categorization scheme with six categories (Table 5).

Maintaining direct payments includes farmers' attitudes toward continuing a sectorial income policy through direct payments without further adjustments. 36% of all statements could be assigned to this category in Cluster B. Most farmers mentioning this issue are located in Eastern Germany. Cluster B is primarily concerned about *"long-term planning, security, reliability" (Cluster B)* for the future of direct payments, and farmers point out their need for direct aid as these payments stabilize their agricultural income. Moreover, farmers emphasize that *"direct payments should remain in place, no reallocation into the 2nd pillar, (and) no disadvantage for conventional farms" (Cluster B)*, underlining their view about the upcoming CAP reform to discriminate against conventional farms.

The second category, **competitiveness**, deals with the competitiveness of farms and the agricultural sector. Due to European environmental requirements, farmers suggest compensating for higher farming standards for European farmers to facilitate the competitiveness of their farms and the agricultural sector compared with non-EU countries. Farmers feel disadvantaged considering the EU's contemporary plant protection and manure requirements. *"Convert direct payments into production aid as originally intended, compensating for higher costs of European food production compared to the world market" (Cluster A).* However, less than 10% of all statements are designated to that topic, indicating the minor role of the debate for all clusters surrounding farms' competitiveness.

Concerns related to the distribution of CAP payments are summarized in the third category, **fairness**. It includes more financial support for farms in regions with natural constraints and smaller farm structures, the capping of direct payments, and the eligibility for active farmers. More than 30% of the statements in each cluster relate to the distribution of state support, criticizing the current payment system, which is beneficial, particularly for large farms with high incomes. Most comments refer to more support for small and family farms and a stronger consideration of the farms' individual needs (50% for all three clusters). Additionally, farmers emphasize the capping or degression of direct payments for a fairer distribution of income support (32% for all clusters), indicating their perception of discrimination against small farms by the current direct payment system. In Clusters B and C, most farmers who commented on this issue run a farm with an average size of 30 ha, while farms in Cluster A are slightly larger (median = 46 ha). Furthermore, farmers point out that smaller farms are subject to economic pressure due to increased demands, but at the same time, working in a more environmentally friendly way since they are smaller in scope, supporting biodiversity. Aside from that, direct payments affect rental land prices and suggest revising payment entitlements to apply for direct payments. *"Direct payments should be paid directly to the active farmer, and not to the landlord" (Cluster A)*. Interestingly, most farmers who commented on this issue are located in Eastern Germany, followed by farmers from Southern Germany.

The fourth category focuses on **environmental protection and animal welfare**. Farmers are concerned about the distribution of direct payments, and linking them to ecological measures would imply a fairer allocation of these payments. *"Environmental measures should play a major role in the disbursement of direct payments; no disbursement of direct payments per hectare" (Cluster C)*. Cluster C suggests

that payments should be paid for environmental services and the provision of public goods, emphasizing their pro-environmental attitude (37% of all statements). Most of the statements come from farmers located in North-West Germany. In addition, several farmers mention the delinking of direct payments from the farming area, mainly found for organic farmers in Cluster C. On the contrary, farmers in Cluster B criticize existing environmental measures. They favor setting more incentives for environmentally friendly practices: *"Instead of more flower strips, planting trees and hedges at the edges of the farming area should be supported. We need to ensure food security and not set aside arable land. What we need are higher incentives" (Cluster B).* To a minor extent, farmers engaged in animal husbandry favor a stronger linkage of direct payments on requirements for animal welfare, which only appears for Clusters B and C.

The next category, **deregulation**, highlights the reduction of regulations, management requirements for farming, and the application for direct payments. For example, a high level of bureaucracy and existing environmental conditions that farmers must comply with are overburdening, mostly perceived by Cluster B (13%) and farmers located in Eastern Germany. *"Reduce bureaucracy! We want clear and reliable long-term regulations" (Cluster B).* This illustrates the existing discontent of farmers with the administrative burden and, at the same time, the desire for stability and planning security. On the contrary, Cluster A would prefer to abolish all farming requirements and related payments to be more independent from policy interventions by the EU: *"Fewer agricultural restrictions! I want more freedom of action on my land again!" (Cluster A).*

Lastly, the **abolishment of direct payments** deals with farmers' desire to be more independent of direct payments. "All premiums should be abolished, and fair product prices for the products I produce should be introduced. Living from work and not from the alms of the state!" (Cluster A). Primarily, Cluster A comments on that issue (31% of farmers' statements) and farmers who are located in North-West and Southern Germany. Instead of receiving direct payments, they would prefer higher prices for their products. "Stop direct payments! The farmer would like to negotiate its product prices fairly" (Cluster A). Unfortunately, farmers are less clear about their ideas of the 'fair' prices they would like to receive.

Overall, different concerns are raised within clusters regarding the future design of direct payments. As Cluster A (Independents) criticizes policy support design and would prefer to be more independent in their farming decisions, Cluster B (Conservatives) advocates the maintenance of direct payments without a stronger linkage to environmental conditions, including higher ecological standards and the deregulation of management requirements. On the other hand, Cluster C (Environmentalists) favors a more environmentally oriented development of the CAP, mentioning delinking direct payments from the farming area to receive a fairer distribution of policy support. Finally, the distribution of direct payments concerns farmers across clusters similarly, in particular farmers located in Eastern Germany, suggesting an equitable allocation for smaller farms and the capping or degression of direct support.

5 Discussion and Conclusion

This paper investigated German farmers' attitudes toward the future of direct payments and their understanding of these decoupled payments. Based on a comprehensive sample of 435 German farmers, we applied multivariate analysis methods and identified three distinct groups. The Independents have an entrepreneurial mindset, and policy and environmental regulations are seen to constrain their future farming plans. Therefore, abolishing direct payments is perceived as gaining freedom from policy conditions, which provides them with more entrepreneurial activity. These farmers have relatively large farms, mainly working full-time in agriculture and adhering to conventional farming methods. Independents are characterized by competitive farms, which are less dependent on income support for their farming activity than farmers in other clusters. Next, the Conservatives farm primarily conventional, work part-time more often and are located in Eastern Germany. They believe that their farms' survival depends on policy support. They perceive policy and environmental conditions stipulated by the CAP are overburdening, indicating that Conservatives feel less competitive than the Independents. Accordingly, concerns about existential uncertainties emerge from the new CAP reform. Finally, the Environmentalists show a pronounced environmental awareness and are open to higher environmental standards within the CAP. These farmers farm organically on smaller farms compared to the Independents and Conservatives.

Across clusters, farmers criticize the unfair distribution of direct payments and refer to the capping or degression of payments. Interestingly, farmers from Eastern and Southern Germany mainly comment on this issue, suggesting that political opinions and perceptions on that issue vary across regions. Overall, the statements highlight the political importance of the debate about the distribution of income support and fairness in general. The increase in redistribution payments for the first ha in 2023 in Germany could be regarded as an attempt to address the uneven distribution of income support payments. From a scientific perspective, there remain doubts about the effectiveness and the general objective of redistributive payments in their current shape (SAHRBACHER et al., 2015, PE'ER et al. 2019).

While each group of farmers expresses different concerns about the direct payments scheme, on average, farmers have not fully internalized that direct payments are decoupled from production and solely linked to the eligible land. This indicates that the farmers' average is not sufficiently informed about the CAP. This misinformation could undermine the effectiveness of CAP measures when policy instruments are perceived differently than intended, as farmers could handle direct payments differently. For instance, if farmers treat the payments as 'coupled' by spending at least some of those payments to subsidize non-competitive production activities (BRADY et al., 2017), this would maintain the production- and market-distortive effects of coupled payments as observed before the Fischler-Reform (2003).

Thus, improving the effectiveness of policy measures requires sufficient information about the CAP's objectives for farmers, communicated to farmers in a precise and understandable way. For example, an ex-ante analysis of the impact of the policy on farmers could be carried out by asking farmers specifically about a planned policy measure. In this way, farmers' understanding of policy instruments could be improved. Thus, there are opportunities to facilitate greater support for the farming community which includes focusing on transparent and direct communication strategies with farmers.

From a policy perspective, several policy instruments would address farmers in each cluster, for instance, the Independents would respond well to policy instruments that combine environmental protection with entrepreneurship that offer economically rewarding agricultural production. The Conservatives advocate an income policy based on direct payments, rejecting a stronger environmental-oriented development. Reducing bureaucracy hurdles and higher incentives to apply climate-friendly practices would be needed to address them. Additionally, peer learning groups of farmers (GREEN et al., 2020) or contact with agricultural advisors (DAXINI et al., 2020) have been recognized as a means to encourage farmers toward a positive change in their thought patterns and behavior regarding the implementation of environmental standards. Finally, the Environmentalists favor a more ecologically oriented CAP that rewards their ecological ambitions. An income support system that is more performance-oriented, increasing the income conditionality on environmental action and gearing direct payments towards the protection and provision of public goods, could be suitable for these farmers. Overall, as a multifunctional policy design does not apply to all farmers in the same way, engaging farmers in policy reforms requires a more differentiated design of policy interventions that allow for a certain degree of flexibility, and longer transformation periods (WBAE, 2018) to account for the heterogeneous preferences within the farming sector as outlined in this paper.

Although the present sample is representative of the German farming population in terms of farm size and regional distribution of farms, there are still limitations in interpreting the results. Farmer characteristics such as age and educational level influence their attitudes and behavior (BURTON, 2014). Older and highly educated farmers are slightly over-represented in our sample, affecting the survey's results. However, this study offers a good starting point for further research. Based on that knowledge, more attention should be paid to farmers' acceptance of alternative and practical income stabilization tools. Furthermore, a similar approach could be applied in other European countries to compare farmers' perspectives on direct payments to investigate the need for concrete policy adjustments.

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