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Farmers' Participation Motivations and Sustainability Attitudes in the Context of the Agro-Ecological Programme

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ABSTRACT

The Agro-Ecological Programme, launched in 2023, is one of the most important instruments of the European Union's new Common Agricultural Policy. It aims to encourage environmentally friendly farming practices. This study analyses responses from 80 Hungarian farmers regarding their participation in the programme, motivations, and attitudes towards sustainability. The research employed quantitative methods, with particular attention to farm size, income level, and environmental awareness. The results indicate that participation decisions are motivated not only by economic considerations but also increasingly by sustainability values, especially among younger and more highly educated farmers. The study is primarily recommended for agricultural policy makers, professional agricultural organisations, and agricultural advisors, as its empirical findings contribute to the more effective design and targeted development of agri-environmental programmes, particularly the Agro-Ecological Programme. It may also prove useful to researchers in agricultural economics and rural development, as well as to students at higher education institutions, who examine the connections between sustainable agriculture, agroecology, and farmer decision-making in the context of the new Common Agricultural Policy.
Keywords: agroecology, sustainability, motivations, environmental awareness, agricultural policy

1. INTRODUCTION

The environmental and economic challenges facing European agriculture in the 21st century – including the impacts of climate change, biodiversity loss, soil degradation, and market and income uncertainties – create a complex adaptation imperative that requires a comprehensive transformation of production systems. The European Union's new Common Agricultural Policy (CAP)

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for 2023-2027 accordingly focuses on sustainability, the preservation of ecosystem services, and the implementation of climate considerations. One of the key elements of the CAP reform is the Agro-Ecological Programme (Agro-ökológiai Program, AÖP), which supports farming practices such as soil conservation, the maintenance of landscape elements, biodiversity-enhancing interventions, and the reduction of plant protection loads. The aim of this programme is twofold: on the one hand, to reduce environmental burdens through financial incentives and, on the other hand, to promote wider social and professional acceptance of the agroecological approach.

However, for policy instruments to effectively support the agroecological transition, a deep understanding of the factors shaping farmers' decision-making processes is essential. International research increasingly shows that farmers' participation in environmental programmes is not solely determined by economic incentives: personal values, attitudes, risk perceptions, professional experience, and community norms also influence the adoption of sustainability innovations. These factors are particularly significant in Central and Eastern Europe, where agricultural structures are diverse, and farms exhibit significant heterogeneity in terms of size, capital endowment, technological development, and environmental awareness.

Empirical research on farmers' motivations and attitudes can therefore provide important insights for improving the effectiveness of agri-environmental policy instruments. Understanding how socio-economic characteristics, environmental awareness, and previous programme participation influence farmers' decisions may help policymakers design more targeted and accessible support schemes. Such knowledge is particularly valuable in the context of newly introduced programmes like the AÖP, where long-term success depends on both participation rates and genuine behavioural change. Consequently, examining farmers' perceptions and sustainability orientations is essential for evaluating the programme's early impacts and future development potential.

2. LITERATURE REVIEW

2.1 The EU Common Agricultural Policy (CAP) and the context of agroecological measures

The Common Agricultural Policy of the European Union has been given a strong environmental and sustainability dimension in the framework of the 2023-2027 reform, in which agroecological and agri-environmental instruments (e.g., eco-schemes and agri-environmental schemes) play a key role in the sustainable transformation of agricultural practices (European Commission, 2024). The CAP strategic plans are supported by eco-schemes, which aim to encourage farmers to modify their agricultural practices in line with environmental and climate protection goals (Nagy, 2024; Nagy & Soós, 2025). The CAP is closely linked to the objectives of the EU European Green Deal (e.g., Biodiversity Strategy and Farm to Fork) and its strategic environmental objectives (Lámfalussy et al., 2023).

Agroecological programmes – such as the Hungarian AÖP – represent a specific form of agri-environmental incentives based on voluntary environmental and climate-conscious practices. These are similar to the previous Agri-Environmental Management (AEM) measures but are integrated into the 2023 CAP strategy (Csizmady et al., 2024). The aim is to protect soil and water, increase biodiversity, and support climate-friendly practices.

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2.2 Farmers' motivations and participation decisions in agri-environmental schemes

According to the scientific literature, the motivations that influence farmers' participation decisions are multidimensional and are not limited to economic incentives:

a) Economic and income factors

Most research shows that economic incentives, such as financial compensation or income stability, significantly influence participation in schemes (Makszim, 2011; Szabó, 2013). The "fairness" of the compensation rate – i.e., the balance between sacrifice and benefit – is a key factor for farmers. This is particularly important in the case of agri-environmental measures, where income disadvantages may also occur in the initial period of implementing environmentally friendly practices (Lastra et al., 2015).

b) Demographic and social factors

The literature emphasises that demographic characteristics, such as age, education, and experience, influence farmers' attitudes and motivations. Younger and more educated farmers often have stronger environmental awareness and commitment to sustainability, which increases their willingness to participate (Makszim, 2021; Zsóka et al., 2011). This includes a positive attitude towards sustainable agricultural practices and a higher likelihood of adopting innovations (Podruzsik & Fertő, 2024).

c) Behavioural and institutional factors

Participation is influenced by behavioural factors such as farmers' environmental values, risk tolerance, and trust in the programme. Furthermore, institutional frameworks – such as participation conditions, administrative burdens, and local support structures – play a crucial role in the programme's effectiveness. The literature also highlights the importance of contextual differences – for example, regional or economic size-dependent – that determine which factors affect participation (Szilárd & Imre, 2024).

2.3 Sustainability and Agroecological Practices

Agroecology as a professional and practical direction emphasises the enhancement of ecosystem services, biodiversity goals, and the sustainable use of natural resources (Kosztyuné et al., 2024; Magyar & Macher, 2023). Agricultural systems thus serve not only productivity goals but also integrate ecological and social sustainability (Van Cauwenbergh et al., 2007). Agroecological frameworks (as a science and a practical approach) aim to develop agricultural practices in harmonious cooperation with natural systems, preserving biodiversity and maintaining natural capital in the long term (Szilágyi et al., 2018).

The CAP reform partly reflects a shift towards these principles: greening and agri-environmental incentives aim to promote agricultural practices that contribute to climate protection and biodiversity objectives (Kopasz, 2005). This includes promoting soil and water protection, as well as sustainable plant protection practices.

2.4 Hungarian specificities in agri-environmental and agroecological programmes

Historical institutional development, landholding structures, farmer attitudes, and domestic agricultural policy adaptation processes fundamentally determine the specifics of Hungarian agri-environmental and agroecological measures. Hungary had been implementing environmentally friendly agricultural support programmes even before EU accession, which were integrated into the AEM system of the Common Agricultural Policy upon accession (Baráth & Fertő, 2017).

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Differences arising from the structure of Hungarian agriculture – especially the high proportion of large farms in Central and Eastern Europe – create a distinct motivational pattern regarding agri-environmental measures.

In Western Europe, agri-environmental participation is largely characteristic of smaller, family-run farms (often motivated by a combination of environmental values, low opportunity costs, and stewardship norms) (Burton & Schwarz, 2013). In Hungary, however, due to the significant territorial weight of large farms, undertaking these measures more often appears as a strategic, income-stabilising decision (Fertő & Szabó, 2020). In the case of large-scale farm structures, however, the costs of adapting to environmental regulations and management capacities may differ, which affects the uptake of agroecological practices (Popp et al., 2018).

Farmers' participation decisions in Hungary are particularly strongly determined by their trust in the predictability of agricultural policy. Previous studies by Szabó et al. (2011) have shown that farmers are often cautious about new programmes, primarily due to the variability of programme conditions, the complexity of support systems, and administrative costs. This trust dimension is also clearly evident in the introduction of the AÖP in 2023: although the programme promised flexibility and a simpler set of conditions, uncertainties emerged among farmers regarding scoring, practice monitoring, and the predictability of payments (AKI, 2023).

Regional differences play a specific role in Hungary. Research consistently shows that while in the regions of Western Hungary – where the average size of farms is smaller, the state of the environment is more favourable, and rural social networks are stronger – there is a greater willingness to undertake environmentally friendly measures, in the Great Plain the dominance of large-scale production, water scarcity, and the income exposure of farms reduce the motivation to participate (Nagy, 2007; Vincze & Tóth, 2019). The system of agricultural advisory services also contributes to regional differences: the expertise and accessibility of advisors significantly impact farmers' decisions.

When evaluating Hungarian agri-environmental and agroecological measures, the literature agrees that environmental effectiveness has been mixed to date. Although the programmes have contributed to improvements in certain ecological indicators – such as grassland biodiversity and soil conservation practices (Batáry et al., 2015) – the measures are often insufficiently targeted or do not always reflect local ecological needs. This is also in line with the European literature, which finds that CAP-based measures are often too general, thereby limiting their effectiveness in protecting biodiversity (Pe'er et al., 2020).

Several authors examine the limitations and opportunities of domestic adaptation of agroecology from the perspectives of social acceptance and farmer identity. The agroecological transition is not merely a technical or agronomic issue, but a "social innovation process" in which cooperation between farmers, knowledge sharing, and rural communities play a decisive role. In Hungary, these networks are developing but do not yet reach the strength of Western European agroecological movements (Wezel et al., 2018).

Overall, the specificities of Hungarian agri-environmental and agroecological programmes show a complex institutional and structural pattern. Economic motivations, political trust, land tenure structure, and regional ecological and social factors simultaneously influence the willingness to participate. These specificities determine the extent to which the AÖP introduced in the new CAP period can promote the spread of truly sustainable, agroecological-based farming practices in Hungary.

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3. MATERIALS AND METHODS

During the study, 80 farmers were interviewed using a questionnaire. The questionnaire included eight ordinal variables:

- educational level,
- farm size,
- years of farming experience,
- net sales,
- frequency of integrating environmental awareness into agricultural activities,
- degree of actively striving for sustainability in agricultural activities,
- extent to which respondents felt they had become more environmentally conscious through participation in the AÖP,
- level of agreement that the AÖP significantly contributes to more sustainable farming practices and improved environmental health in Hungary.

It also included two binary (nominal) variables:

- current participation in an environmental support programme (yes/no),
- previous participation in an environmental support programme (yes/no).

All ordinal-ordinal and nominal-ordinal variable pairs were analysed for correlations. Spearman's rank correlation coefficient was used to explore relationships between ordinal variables, while the χ^2 test and Cramer's V were used to examine associations between nominal and ordinal variables (Makszim, 2023). The sample size was 80.

Spearman's rank correlation coefficient was chosen because the variables were measured on an ordinal scale, a normal distribution could not be assumed, the method reduces the influence of outliers, and it allows detection of monotonic (but not necessarily linear) relationships.

Statistical analyses were performed using Jamovi software (Version 2.7.6; https://www.jamovi.org). Based on the Spearman correlation matrix, significant relationships were found among the variables in four cases, all with $P < .05$. These results highlight significant relationships between certain farmer characteristics and their sustainability aspirations, as well as their perceptions of the Programme's impacts.

4. RESULTS

The results of the questionnaire survey show significant correlations between farmers' sustainability attitudes and their experiences with the AÖP at several points. These correlations are consistent with previous research, which indicates that the adoption of sustainable agricultural practices is often associated with education, farming approach, and participation in previous environmental programmes (Zachariou et al., 2025).

A significant positive relationship was found between educational level and the degree of active sustainability efforts (Spearman's $\rho = 0.309$, $P = 0.005$). This correlation supports the literature finding that farmers with higher levels of education are more open to adopting innovative, environmentally friendly solutions (Knowler & Bradshaw, 2007).

There was also a significant, moderately strong positive relationship between active sustainability efforts and the frequency of integrating environmentally conscious practices (Spearman's $\rho = 0.437$, $P < .001$). This suggests that farmers who consciously strive for sustainability more consistently integrate environmentally friendly procedures into their daily activities—a pattern also confirmed by previous European studies (Swart et al., 2023).

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A similar relationship was observed between active sustainability efforts and environmentally conscious thinking promoted by the AÖP (Spearman's ρ = 0.442, P < .001). The programme, therefore, appears to have an impact, especially on those who are already more fundamentally committed to sustainability, consistent with previous studies examining the mechanisms by which environmental protection programmes affect behaviour (Wilson & Hart, 2000).
In addition, a significant positive relationship was identified between perceptions of the programme's benefits and the strengthening of environmentally conscious thinking (Spearman's ρ = 0.432, P < .001). Farmers who considered the programme effective reported a greater attitude-shaping effect, consistent with Padel and Lampkin's (2007) findings on the role of support systems in shaping attitudes.
Examination of the nominal variables revealed that current participation in an environmental support programme was significantly related to environmentally conscious thinking associated with the AÖP ($\chi^2(4)$ = 12.1, P = .017, Cramér's V = 0.389). This suggests that farmers participating in such programmes are more open to accepting new environmental approaches – a pattern also highlighted by other research (Burton et al., 2008).
Previous participation in environmental programmes was also moderately associated with the degree of active sustainability efforts ($\chi^2(3)$ = 11.1, P = .011, Cramér's V = 0.373). Past participation, therefore, appears to have a positive long-term effect on farmers' behaviour, which aligns with the literature's findings that programme membership has cumulative learning and attitude-shaping effects (Burton & Schwarz, 2013).
Overall, the results indicate that the impact of the AÖP is most significant for farmers who already have an environmental commitment, although the programme also contributes to attitude formation. This supports research lines that emphasise the dual economic and attitude-shaping role of support systems in the sustainable agricultural transition (Darnhofer, 2020).

5. CONCLUSION

5.1 Conclusions based on the correlation matrix

The research revealed four significant positive correlations among the ordinal variables:
1) Educational level and the degree of active sustainability efforts in agricultural activities showed a significant positive correlation (Spearman's ρ = 0.309, P = 0.005, df = 78). This suggests that farmers with higher education are moderately more likely to apply sustainable practices.
2) The degree of active sustainability efforts and the frequency of integrating environmental awareness into agricultural activities were even more strongly correlated (Spearman's ρ = 0.437, P < .001, df = 78). This indicates that farmers who are more committed to sustainability tend to integrate environmentally conscious practices into their operations more regularly.
3) Active sustainability efforts and the level of environmentally conscious thinking developed through use of the AÖP correlated the most strongly of the group (Spearman's ρ = 0.442, P < .001, df = 78). This implies that farmers who are more actively committed to sustainability tend to develop a greater degree of environmentally conscious thinking through the programme.
4) Finally, farmers who perceived the AÖP as contributing meaningfully to sustainable farming and environmental health in Hungary also reported greater attitude change through the programme (ρ = 0.432, P < .001, df = 78), reinforcing the notion that positive perceptions and pre-existing commitment reinforce each other.

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5.2 Conclusion based on associations

The study showed a significant association between current participation in an environmental support programme and the degree of environmentally conscious thinking developed through the AÖP ($\chi^2(4) = 12.1$, P = .017, Cramér's V = 0.389), as also shown in *Table 1* and *Table 2*. Among the 67 participants currently in the programme, the majority were environmentally aware before participation and indicated higher levels of environmental awareness (scores 3-5).
In contrast, the 13 non-participants typically showed lower levels of environmental awareness (scores 1-4). Overall, participation in such programmes is associated with higher levels of environmental awareness. Cramér's V indicates a medium-strength association, suggesting that farmers who participate in these programmes tend to develop more environmentally conscious attitudes as a result of the AÖP. This finding is important because it demonstrates that such programmes not only provide practical support but also contribute to the long-term strengthening of sustainable thinking among farmers (Apáti & Makszim, 2025). In the long term, this is particularly relevant because changing climatic conditions increasingly necessitate transforming traditional farming methods, for which an environmentally conscious attitude provides an indispensable foundation (Kosztyuné et al., 2023; Soós & Makszim, 2024).

Table 1: Independence review results

	Become more environmentally conscious by using the AÖP					
Now participating	**1**	**2**	**3**	**4**	**5**	**Total**
No	2	3	3	4	1	13
Yes	0	10	30	23	4	67
Total	2	13	33	27	5	80

χ^2 Tests			
	Value	**df**	**p**
χ^2	12.1	4	0.017
N	80		

Table 2: Cramer's association coefficient

Nominal	
	Value
Phi-coefficient	NaN
Cramer's V	0.389

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Table 3 clearly shows that those who had previously participated in environmental support programmes (n = 51) exhibited higher levels of aspiration (scores 4-5), whereas non-participants (n = 29) tended to report lower or medium levels of aspiration (scores 2-4). This suggests that previous participation in such programmes is associated with higher aspiration or goal orientation.

Table 3: Level of aspiration in relation to previous participation in the program

	Aspiration				
Previously participated	**2**	**3**	**4**	**5**	**Total**
No	4	12	13	0	29
Yes	1	13	28	9	51
Total	5	25	41	9	80

The study revealed a significant association between previous participation in environmental support programmes and the degree of active sustainability efforts in agricultural activities ($\chi^2(3) = 11.1$, $p = .011$, Cramér's V = 0.373). Cramér's V indicates a medium-strength association, suggesting that farmers who have previously participated in such programmes typically strive to achieve greater sustainability in their activities.

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Gazdálkodók részvételi motivációi és fenntarthatósági attitűdjei az Agro-Ökológiai Program kontextusában

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ÖSSZEFOGLALÁS

A 2023-ban indult Agro-ökológiai Program az Európai Unió új Közös Agrárpolitikájának egyik legfontosabb eszköze, amelynek célja a környezetbarát gazdálkodási gyakorlatok ösztönzése. Ez a tanulmány 80 magyar gazdálkodó programban való részvételükkel, motivációikkal és a fenntarthatósághoz való hozzáállásukkal kapcsolatos válaszait elemzi. A kutatás kvantitatív módszereket alkalmazott, különös figyelmet fordítva a gazdaság méretére, a jövedelmi szintre és a környezettudatosságra. Az eredmények azt mutatják, hogy a részvételi döntéseket nemcsak gazdasági megfontolások, hanem egyre inkább a fenntarthatósági értékek is motiválják, különösen a fiatalabb és magasabban képzett gazdálkodók körében. A tanulmány elsősorban agrárpolitikai döntéshozóknak, mezőgazdasági szakmai szervezeteknek és mezőgazdasági tanácsadóknak ajánlott, mivel empirikus eredményei hozzájárulnak az agrár-környezetvédelmi programok, különösen az Agroökológiai Program hatékonyabb megtervezéséhez és célzottabb fejlesztéséhez. Hasznos lehet az agrárgazdasági és vidékfejlesztési kutatók, valamint a felsőoktatási intézmények hallgatói számára is, akik az új Közös Agrárpolitika kontextusában vizsgálják a fenntartható mezőgazdaság, az agroökológia és a gazdálkodói döntéshozatal közötti összefüggéseket.
Kulcsszavak: agroökológia, fenntarthatóság, motivációk, környezettudatosság, agrárpolitika

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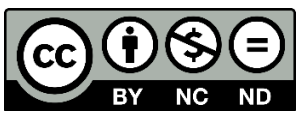

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