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Implementation Dynamics and Environmental Impact of the Common Agricultural Policy in Maramureș County, Romania

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ABSTRACT

The Common Agricultural Policy is focused on the environment increasingly degraded by intensive agriculture. The aim of the study is to analyse the effectiveness of the measures implemented under the Common Agricultural Policy in Maramureș County, Romania during the reference period 2007-2023. This research monitored the intervention logic for the payments made in relation to environmental benefits. The effectiveness of this policy was evaluated by processing primary data collected by conducting a survey and getting answers from 350 respondents, most of them farmers, but also representatives of the local public administrations or agricultural institutions in the county. Results show large gaps between the objectives set by the policy and the actual benefits declared by respondents in the study area. Following the introduction of the greening scheme, farmers in Maramureș county reported little change in farming practices as a result of its implementation. Moreover, farmers have incurred low costs for the implementation of greening measures, resulting in an unfair cost-benefit outcome. These results make it necessary to reduce the arable area to a lower incidence limit for the greening scheme in order to address a larger number of farmers and bring out the need to redefine voluntary environmental measures, with more demanding requirements to bring major environmental benefits. The main change that should be made concerns the removal of more measure-specific requirements to avoid double funding. Other changes relate to the inclusion of more complex requirements for measure 10 - agri-environment and measure 13 addressing areas facing constraints. Currently, the requirements are designed to conserve farming practices, not to generate additional environmental benefits. This study can be a solid starting point for extending the research to the county level or replicating the study in other regions.

1. INTRODUCTION

The Common Agricultural Policy (CAP) was first established in 1962 and is one of the most important policies of the European Union (EU). This policy was designed as a partnership between stakeholders and its main aim was to ensure food security and fair prices for consumers (Nazzaro and Marotta, 2016; Maxim, 2023). While at the beginning this policy focused on increasing the quantity of agricultural products generating the phenomenon of overproduction, beginning with the introduction of the scale of agricultural pollution, the CAP changed its approach by focusing on the environment (Lefebvre et al., 2015; Henke et al., 2018; Staniszewski and Borychowski, 2020). Thanks to Sicco Mansholt's ambition, in 1968 the European Commission drafted the "Memorandum for the reform of the Common Agricultural Policy". Under this reform, farmers' incomes were limited to a maximum level of production. However, the most radical change to the CAP was Ray MacSharr's reform in 1992. It offered direct payments for the area cultivated or the number of animals, conditional on compliance with environmental standards and good farming practices. Agenda 2000 was the basis for the division of the Common Agricultural Policy into today's two pillars: Pillar I - market measures and Pillar II - rural development. The last reform, implemented in 2013, aimed to enhance the sustainability of the Common Agricultural Policy (CAP). As part of this reform, the greening scheme was introduced, providing farmers with direct payments contingent on meeting three key conditions: maintaining permanent grassland, diversifying crops, and establishing ecological focus areas (EFA) (European Council, n.d.a). The greening scheme is seen as a measure of high complexity but with low environmental benefits, as demonstrated by European Court of Auditors (2017), because the conditions imposed by greening were met by a small number of farmers. In the context of agricultural recession in northern Italy, Vanni and Cordillo (2013) warned about the small number of farms that will be subjected to the greening scheme introduced by the 2013 reform. Later on, Was et al. (2014) strengthened the conclusions of Vanni and Cordillo arguing that the majority of farms in Poland were meeting the greening conditions even before this policy was officially introduced. Furthermore, Czekaj et al. (2013) identified a large number of farms in Poland that were exempted from greening obligations, thus diminishing the benefits of the scheme. In a literature review, similar to that of the European Court of Auditors (2017), Gocht et al. (2017) assessed the intervention logic for greening measures by the ratio between implementation costs and environmental benefits at EU level, highlighting modest environmental results. Furthermore, in their studies, Pe'er et al. (2019) and Majewski et al. (2018) argued that even the new post-2020 Common Agricultural Policy will not cope with the growing environmental problems due to reduced requirements. However, greening is not totally ineffective, since it has achieved some positive results in reducing greenhouse gases (GHG) and improving water or soil quality.

The reduced benefits of greening measures are generated by the overlapping requirements of several CAP measures. Several authors have assessed greening through improvements in air, soil, water and biodiversity quality. In a research carried out in northern Italy on a sample of 3000 farms, Solazzo et al. (2016) showed reductions in other greenhouse gases as follows: 2% for CO_2 (carbon dioxide), 2.1% for N_2O (nitrous oxide) and 0.4% for CH_4 (methane). Following the EU-wide studies, Pelikan et al. (2015) predicted improvements in biodiversity erosion by banning chemicals in ecologically valuable areas, but also an increase in prices due to the restriction of agricultural land. In one of the most complex studies on the Common Agricultural Policy, Pe'er et al. (2022) assessed the recommendations of 300 experts in workshops organised by the European Commission (2021), and concluded that the 2007-2023 CAP has not halted biodiversity decline. On the other hand, it has its merits in mitigating soil erosion due to the obligation to maintain permanent grassland. Regarding the status of water quality following greening, Solazzo et al. (2015) conducted a research on 2000 farms in northern Italy, but did not report substantial improvements in water quality. However, they found a reduction in the amounts of nitrogen used by farmers. In a more extensive study, Brown et al. (2020) analysed the CAP for the period 2007-2019 using both the literature method and interviews with farmers or decision-makers in seven EU member countries. As a result of this research, they argue that CAP instruments are not sufficient to address the growing environmental challenges. In a recent article on agricultural policy at the EU level, Roman et al. (2022) stated that agricultural pollution is outweighed by the benefits of the policy. On the other hand, Pe'er et al. (2020) are more drastic and claim that CAP is failing on biodiversity, climate, soil, but also on socio-economic issues. To this end, they sent the European Commission a document on the review of the Common Agricultural Policy with 3600 signatories. The purpose of this petition is to draw attention to the fact that it is absolutely necessary to introduce much more stringent measures to protect the environment through agriculture. Furthermore, this greening pattern is influenced by land morphology and area where farms are located. According to several authors, including Cimino et al. (2015) and Helming and Tabeau (2018), some of the greening scheme requirements were mainly referring to farms located in the lowland zone, an area

favourable to large farms and monoculture. Similar results were obtained by Solazzo and Pierangeli (2016). Another indicator of the efficiency of the greening scheme is the cost-benefit ratio. The cost-benefit ratio is unfair because farmers have had to spend considerably less to implement the measures than the subsidies received. Farmers continue to receive income support under greening schemes without significant environmental benefits, a fact supported by Czekaj et al. (2013) and Mahy et al. (2015). Even if the last reform did not fully achieve its environmental objectives, Ciliberti and Frascarelli (2015) consider that the 2014-2020 CAP can be a bridge to the next programme. Cortignani and Dono (2015) and Singh et al. (2014) argue that there are some benefits from the implementation of the greening scheme, but they are not sufficient and the Common Agricultural Policy needs to be fundamentally rethought. Heyl et al. (2021) argue that even measures in the CAP 2021-2027 will not be able to cope with agricultural pollution. In contradiction to these reforms, the agricultural sector is still a major polluter generating GHG emissions. The most common emissions are CO_2, CH_4 and N_2O. Wolfson et al. (2022) estimate that the agricultural sector, together with the food sector, accounts for 30% of total EU GHG emissions. It is not just the atmosphere that suffers from agricultural pollution, but also water and soil. The purpose of this research is to evaluate the implementation of the National Rural Development Programme under the Common Agricultural Policy in Maramureş County and its impact on the environment during the reference period of 2007 - 2023. The assessment of environmental and climate measures aims to determine the number of farmers subject to mandatory greening measures and the expectations of voluntary measures. Maximising the benefits offered through CAP is very important because of the historic pollution that still leaves its mark on the county. The aim is to establish the contribution of agriculture to the county's economy and highlight the environmental progress made in Maramureş County. Identifying the specific constraints of the study area and assessing awareness of the CAP are necessary to evaluate the programme and to design the required adjustments in order to make the intervention more efficient. The results will significantly contribute to adapting the future CAP to the needs of the area. The recommendations will provide a solid basis for future greening and rural development measures at the national and European level.

2. THEORY AND METHODOLOGY

2.1. Study area

Geographically, Maramureş County is located in the northern part of Romania and covers an area of 6304 km², which represents 2.6% of the country's surface area. The topography is predominantly mountainous (43%), complemented by hills and foothills (27%) and plains (30%) (Kacsó and Mariş, 2011). The climate is temperate-continental and the hydrographical network is very rich. The geographical map, with the landforms and the administrative territorial units that make up the county, as well as the four historical-ethnographic zones are shown in Figure 1.

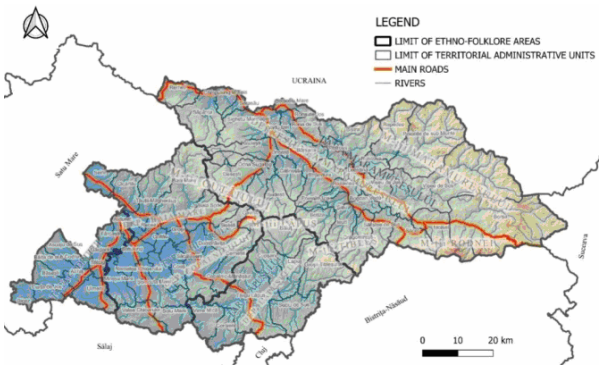

Fig. 1. Maramureş county. Study area.

The county's economy is varied and different compared to 1990, when agriculture was a significant contributor to the central fund, or compared to 2007, when due to Romania's accession to the EU, the mining industry, which was a basic sector, did not align itself to the European standards and ceased its activity. The economy is now based on services and export-oriented industry. Secondary activities include logging and wood processing, agriculture and tourism. Agriculture is agro-pastoral, being widespread among the population as a main or secondary activity.

2.2. Methodology

In order to achieve the main aim, research methods found in the literature, such as analysis or comparison, as well as methods used in the development or evaluation of the Common Agricultural Policy at governmental level, namely surveys, were used. The main research method consists of a survey, administered on-site, using an omnibus questionnaire covering a number of distinct topics. Most questions had single or multiple answers.

The questionnaire was administered to 350 people, from four historical-ethnographic regions: Ţara Lăpuşului (Lăpuş Region) (30), Ţara Codrului (Codru Region) (51), Ţara Chioarului (Chioar Region) (103) and Ţara Maramureşului (Maramureş Region) (166). For the homogeneity of results, the number of questionnaires varies from three to seven questionnaires per territorial administrative unit, depending on the size of the localities. A similar model was developed and validated by the Romanian Ministry of Agriculture for the National Strategic Plan 2021-

2027. The present questionnaire is much more complex, adapted to this research and was applied on-site, through face-to-face interviews with the farmers. The average duration of the questionnaire was about 30 minutes and the dialogue went exceptionally well due to the fact that the interview was scheduled in advance.

The main questions of the questionnaire concern the area of the farms, the type of the employed farming or the specific categories of livestock. These were meant to establish the farming practices and mandatory environmental conditions to which farmers are subjected. The evaluation of the programme was carried out through questions on the direct payments received under Pillar I and the voluntary environmental and rural development measures applied under Pillar II, as well as on the costs incurred for their implementation. Information on the types of fertilisers and pesticides used or constraints farmers face was also part of this questionnaire. These are needed to confirm or refute the effectiveness of greening measures, and the results will be compared with those available in the literature.

The raw field results were statistically processed using MedCalc® statistical software version 22.021 (MedCalc Software Ltd, Ostend, Belgium, 2024). Qualitative variables were described using frequency and percentage. Comparisons between regions were performed using the Kruskal Wallis test or chi-square test. The Kruskal-Wallis test is a non-parametric method used to compare means between three or more independent groups. This test is suitable for ordinal or continuous data that are not normally distributed, making it ideal for analysing differences in survey responses between regions. The chi-square test assesses whether there is a significant association between two categorical variables and helps to establish whether there are significant differences in the distribution of categorical variables between the four regions. The test is suitable for comparing proportions of respondents in different categories across regions. To determine statistical significance, the level must have a $p<0.05$.

3. RESULTS AND DISCUSSION

The obtained research results present an overview of the status and dynamics of the implementation of the Common Agricultural Policy in Maramureș County, providing the necessary indicators to achieve the main purpose of this research. The main indicators tracked in the research are the level of Pillar I direct payments and the frequency of application of Pillar II voluntary measures, as well as the farming practices used on farms or the constraints faced in the study area. As the frequency of measures may vary depending on the size of the farms or the farming system practiced, these indicators were also determined. The purpose of determining these indicators is to have an overview at the level of Maramureș county, but also to highlight the differences and similarities between ethnographic areas.

3.1. Description of the agricultural holdings surveyed

The size of farms in terms of surface area varies between 1 and 200 hectares, distributed as follows: 51.1% of farms have an area between 1 and 10 ha, 34.3% have an area between 10-50 ha, and 8.6% of farms have an area between 50-100 ha. Only 6% own agricultural land between 100 and 200 hectares. These results demonstrate that the main share in the county is held by traditional agriculture. However, the frequency between regions is statistically significant, with a $p<0.02$.

In Țara Lăpușului and Țara Maramureșului the land is mainly used for grazing or grass production due to the hilly areas, while in Țara Chioarului and Țara Codrului the land is often used for large-scale farming due to the extension of plain areas. These data reveal the predominance of small farms in the county and are in line with those presented by Roman et al. (2023), who argue that the average farm in the county is 2.4 hectares, below the national average of 3.4 hectares and below the European average of 14.2 hectares. The predominant farming system is the traditional one, 68.9%, followed by intensive farming with 19.7% and organic farming with 11.4%. There are significant differences in frequency for the intensive farming system between the four regions, statistically illustrating a $p<0.001$. Thus, 37.9% of farmers in Țara Chioarului and 35.3% in Țara Codrului practice this type of agriculture. A low frequency is observed in Țara Lăpușului, where only 6.7% of farmers employ specific agricultural practices, and in Țara Maramureșului, where the percentage drops to 3.7%. In contrast, the large areas of intensively farmed land in Țara Chioarului and Țara Codrului can be attributed to the region's relief, characterized by extensive plains.

The considerable number of farmers with small holdings practicing traditional farming is due to the predominantly mountainous relief and the very sparse forest cover. According to the data obtained by Sabou (2013), the county has the smallest arable area in the North-West region and the population employed in agriculture is below the average of the region (Cluj Regional Department of Statistics, 2013). In terms of livestock categories as the main livestock on farms, 79.2% are cattle and 14.2% sheep, while the remaining 6.6% are other animals, with no differences in frequency between regions.

The farming system practised, the full distribution of land holdings or categories of livestock are detailed in Table 1.

Table 1. Description of farms by farming system and livestock population.

Variable		Total (n=350)		Ţara Lăpuşului (n=30)		Ţara Codrului (n=51)		Ţara Chioarului (n=103)		Ţara Maramureşului (n=166)		p
		no.	%	no.	%	no.	%	no.	%	no.	%	
Surface	0-10	179	51.1	18	60.0	17	33.3	48	46.6	96	57.8	<0.02
	10-50	120	34.3	11	6.7	22	43.1	40	38.8	47	28.3	
	50-100	30	8.6	0	0.0	7	13.7	6	5.8	17	10.2	
	100-200	21	6	1	9.8	5	8.7	9	3.6	6	6.0	
Agriculture system	Intensive	69	19.7	2	6.7	18	35.3	39	37.9	5	3.3	<0.001
	Traditional	241	68.9	25	83.3	27	52.9	52	50.5	137	82.5	
	Ecological	40	11.4	4	13.3	6	11.8	12	11.7	18	10.8	
Categories of animals	Cattle	217	79.2	23	92.0	34	79.1	58	87.9	102	79.1	<0.1
	Sheep	39	14.2	2	8.0	5	11.6	5	7.6	27	19.3	
	Other	18	6.6	1	4	4	9.3	3	4.5	9	6.4	

3.2. Level of Pillar I payments

The status and dynamics of the implementation of the measures under the National Rural Development Programme in the period 2007-2023 were assessed through the frequency of direct payments under Pillar I and the frequency of voluntary measures under Pillar II. Farmers received the following direct payments: Single Area Payment Scheme - (SAPS - 100%), National Transitional Assistance - (ANTZ - 72.9%), Complementary Redistributive Income Support for Sustainability - (CRISS - 68.0%), agricultural practices beneficial for the climate and the environment - (PABCM - 88.6%), coupled support scheme (28.3%), young farmers' payment (5.2%), small farmers' payment (4.8%) and de minimis aid (3.1%). Statistically, significant differences between regions were obtained in the case of payment per head of animal, more frequent in Ţara Maramureşului, Ţara Lăpuşului and Ţara Codrului, with a $p<0.01$. The lower frequency of this payment in Ţara Chioarului is due to the predominance of vegetable farms in this area. There was also a significant frequency in the case of redistributive payments, with most beneficiaries in Ţara Lăpuşului and Ţara Maramureşului. This payment is granted to farms with an area of less than 30 hectares, and the high frequency of this payment demonstrates the high number of small farms in Maramureş County. The main direct payment to farmers in Maramureş is the single area payment, the county occupying a leading place in Romania due to the large number of applicants.

The frequency values of direct payments are shown in Table 2.

Table 2. Pillar I direct payments to farmers.

Variable		Total (n=350)		Ţara Lăpuşului (n=30)		Ţara Codrului (n=51)		Ţara Chioarului (n=103)		Ţara Maramureşului (n=166)		p
		no.	%	no.	%	no.	%	no.	%	no.	%	
Measure	SAPS	350	100	30	100	51	100	103	100	166	100	<0.8
	ANTZ	255	72.9	25	83.3	40	78.4	63	61.2	127	76.5	<0.01
	CRISS	238	68.0	28	93.3	27	52.9	59	57.3	124	74.7	<0.001
	PABCM	308	87.5	26	86.2	45	88.2	90	87.4	147	88.2	<0.9
	Young farmer	16	5.2	1	3.8	0	0.0	7	7.6	8	5.4	<0.2
	Small farmer	15	4.8	3	11.5	1	2.2	1	1.1	10	6.7	<0.07
	Coupled support	91	28.3	7	25.0	14	29.8	21	22.6	49	31.8	<0.3
	Minimis	10	3.1	1	3.6	2	4.3	2	2.2	5	3.2	<0.9

3.2.1. Agricultural Practices Beneficial for the climate and the environment

With the greening of payments through the introduction of the greening scheme, three new obligations for farmers receiving the single area payment have emerged: 1) maintaining permanent grassland with the exception of a maximum of 5% of the area owned in the reference year 2015; 2) crop diversification, whereby farmers are obliged to have a minimum of two crops for arable areas between 10 and 30 hectares and a minimum of three crops for arable areas over 30 hectares; 3) introducing ecological focus area at 5% of arable land for arable areas larger than 15 hectares. Farmers practising organic farming or holdings entirely under permanent crops are exempt from these obligations (European Court of Auditors, 2017). In the present case, 11.4% were exempted and 88.6% fell under permanent grassland maintenance, with no significant differences between regions.

Differences were recorded in the case of crop diversification, where 14.2% of farmers had to fulfil this condition, and in the case of the introduction of ecological focus area, which 7.7% of farmers had to fulfil. The data obtained demonstrate the small number of farmers who have undergone the greening scheme and the reduced environmental benefits provided. This scheme has brought about changes in farming practices, especially in the lowland area for the conditions of crop diversification and the introduction of ecological focus areas. A particular merit of greening is the prohibition in the use of chemical substances within areas of ecological interest (European Commission, 2017). In a similar study conducted in northern, central and southern Italy, Cortignani et al. (2017) also identified changes in agricultural practices particularly in lowland areas. The frequency of farmers who benefitted from the greening scheme in Maramureș County is presented in Figure 2.

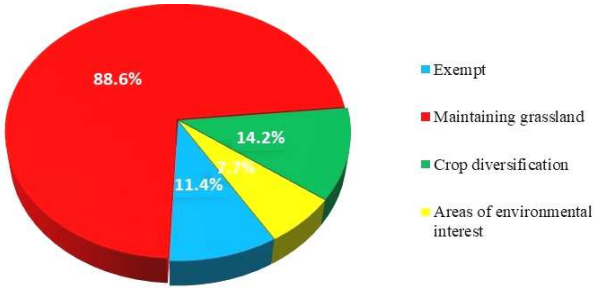

Fig. 2. Farmers who benefitted from the greening scheme (%).

The low number of farmers who have complied with the conditions for crop diversification and introduction of EFA is caused by the exemptions mentioned and the areas of arable land below the threshold. In these conditions, the frequency of occurrence was similar between regions, with a $p<0.001$, a more frequent applicability being noticed in Țara Chioarului and Țara Codrului, areas where the intensive farming system is more widely practised. The greening scheme does not offer the expected benefits as targets a small number of farmers, especially those located in lowland areas and practising monoculture, but it is very attractive economically and promotes some sustainable practices. Also Czyżewski et al. (2020) argue that the Common Agricultural Policy as it is designed cannot achieve its environmental objectives.

3.3. Pillar II environmental and rural development measures

3.3.1. Climate and environment-friendly measures

The greening measures with the greatest applicability are the following: M 13 - payments for areas facing natural or specific constraints (60.0%), M 10 - agro-environment and climate (44.6%) and M 11 - organic farming (13.1%). One applicant has also been identified for M 8 - investments in woodland development and M 15 - forest environmental services, climate services and forest conservation. Two people opted for M 14 - animal welfare payments.

The main environmental measures implemented under Pillar II over the period 2007-2020 are summarised in Figure 3.

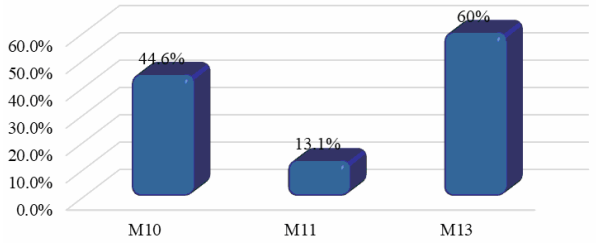

Fig. 3. Main environmental measures implemented through the National Programme for Rural Development.

There were differences in frequency between regions for measures M 10 ($p<0.001$) and M 13 ($p<0.001$), these being more frequent in Țara Maramureșului and Țara Lăpușului. The intensive farming practices common in Țara Chioarului and Țara Codrului go against the requirements of the agro-environment. The high frequency in the application of the measure M 13 results from the fact that in Țara Maramureșului and Țara Lăpușului it is addressed to the majority of localities. An exact comparison with other regions in the country or in Europe for these measures is difficult, as some measures are specific to certain counties or to certain areas within counties, depending on the purpose of the programme.

3.3.2. Rural development measures

The main rural development measures contracted are the following: M 1.4.1 - support for semi-subsistence agricultural holdings (31.7%), M 6.1 - setting up of young farmers (24.6%), M 6.3 - support for the development of small farms (18.3%), M 6.2 - support for setting up non-agricultural activities (11.3%), M 6.4 - support for investments in the creation and development of non-agricultural activities - (7.7%) and M 4.1 - investments in agricultural holdings (6.3%). Frequency differences were found between regions, resulting in a $p<0.001$. This difference can be explained by the fact that in areas where traditional agriculture predominates, farm development measures have prevailed, while in areas with more developed agriculture, measures providing for major investments in agricultural holdings have dominated.

The frequency of application of Pillar II measures are shown in Table 3.

Table 3. Pillar II environmental and rural development measures.

Variable		Total (n=350)		Țara Lăpușului (n=30)		Țara Codrului (n=51)		Țara Chioarului (n=103)		Țara Maramureșului (n=166)		p
		no.	%	no.	%	no.	%	no.	%	no.	%	
Measure	M 10	156	44.6	17	56.7	9	17.6	30	29.1	100	60.2	<0.001
	M 11	49	13.1	4	13.3	6	11.8	14	13.6	22	13.3	<0.9
	M 13	210	60.0	24	80.0	0	0.0	31	30.1	155	93.4	<0.001
	Rural Development	142	40.6	11	36.7	24	47.1	36	35.0	71	42.8	<0.4
Measures of rural development	M 1.4.1	45	31.7	4	36.4	6	25.0	10	27.8	25	35.2	<0.001
	M 6.1	35	24.6	2	18.2	9	37.5	16	44.4	8	11.3	
	M 6.2	16	11.3	1	9.1	2	8.3	1	2.8	12	16.9	
	M 6.3	26	18.3	3	27.3	3	12.5	2	5.6	18	25.4	
	M 6.4	11	7.7	0	0.0	2	8.3	1	2.8	8	11.3	
	M 4.1	9	6.3	1	9.1	2	8.3	6	16.7	0	0.0	

3.4. Cost-benefit ratio for greening measures

A key indicator reflecting the ambition of greening measures is the cost-benefit ratio. The majority of farmers (68.9%) reported costs ranging from 0-10% of the subsidies received for the implementation of measures beneficial for the environment and climate, 24% reported costs ranging from 10-30%, and 7.1% of farmers incurred costs of more than 30%. Only 6.3 per cent of farmers reported major changes in farming practices, further evidence of the modest requirements under the measures.

Table 4. Cost-benefit ratio for the implementation of environmental measures.

Variable		Total (n=350)		Țara Lăpușului (n=30)		Țara Codrului (n=51)		Țara Chioarului (n=103)		Țara Maramureșului (n=166)		p
		no.	%	no.	%	no.	%	no.	%	no.	%	
Implementation costs	0-10%	241	68.9	25	83.3	28	54.9	69	67.0	119	71.7	<0.078
	10-20%	57	16.3	3	10.0	10	19.6	15	14.6	29	17.5	
	20-30%	27	7.7	1	3.3	9	17.6	10	9.7	7	4.2	
	<30%	25	7.1	1	3.3	34	7.8	9	8.7	11	6.6	
Requirement difficulty		22	6.3	2	6.7	2	3.9	4	3.9	14	8.4	<0.4
Practice changes		22	6.3	2	6.7	2	3.9	7	6.8	11	6.6	<0.9

These data are similar to those obtained at EU level, with the European Court of Auditors (2017) confirming this in its Special Report No 21/2017 on greening. Our results are consistent with those obtained by Diotallevi et al. (2015) in a study conducted in central and southern Italy, finding higher implementation costs only for wheat crops. In Maramureş county, these crops are grown on small areas and costs are not significantly influenced by this factor. The cost-benefit ratio gives a relatively even distribution at county level, with no significant differences between regions and it is detailed in Table 4.

3.5. Agricultural practices in Maramureş County

3.5.1. Locally employed fertilisers and plant protection products

The local farming practices define the corresponding farming system. Thus, 20.9% of farmers use chemical fertilisers to maximise production, 59.7% of farmers use pesticides for plant protection and 29.7% use herbicides to eradicate weeds. In the livestock sector, 1.7% use animal growth hormones. The differences in frequency between regions are statistically represented by a $p<0.05$ and emphasise the intensive practices found predominantly in Țara Chioarului and Țara Codrului. Pesticides are most commonly applied to small areas cultivated for self-consumption, except on intensive farms. Due to the high frequency in the application of environmental measures, the use of chemicals is reduced. This is also fuelled by the ban on chemicals within the EFA, which provides the necessary preconditions for improving environmental quality. The predominant traditional farming system is also confirmed by the fact that manure is used by 90.3% of the people interviewed, and chemical fertilisers are often used in addition to organic fertilisers.

Plant protection products accepted in organic farming are used by only 5.1% of farmers. This is explained by the fact that organic farms are characterised by a high proportion of traditional orchards, where treatments are minimal or non-existent. The frequency of fertilisers and plant protection products identified in this study are presented in Table 5.

Table 5. Fertilisers, plant protection products used on farms.

Variable		Total (n=350)		Țara Lăpușului (n=30)		Țara Codrului (n=51)		Țara Chioarului (n=103)		Țara Maramureșului (n=166)		p
		no.	%	no.	%	no.	%	no.	%	no.	%	
Chemicals	Fertilisers	73	20.9	1	3.3	21	41.2	40	38.8	11	6.6	<0.001
	Pesticides	209	59.7	10	33.3	31	60.8	73	70.9	95	57.2	<0.002
	Herbicides	104	29.7	4	13.3	27	52.9	46	44.7	27	16.3	<0.001
	Hormones	6	1.7	0	0.0	4	7.8	2	1.9	0	0.0	<0.002
Organic products	Manure	316	90.3	28	93.3	47	92.2	85	82.5	156	94.0	<0.017
	Organic insecticides	18	5.1	3	10.0	3	5.9	7	6.8	5	3.0	<0.3

3.5.2. Livestock waste management

Solid and liquid manure management can be a source of environmental pollution. Out of the target group, 8.6% of the farmers have a liquid manure drainage system, mainly farms specialised in intensive cattle or pig rearing, and 38.9% have solid manure storage platforms, either compliant or improvised.

A key role in the significant number of existing platforms is the condition imposed by some rural development measures in order to be implemented. Maintaining the conditions and financing these constructions will contribute decisively in limiting the pollution of water bodies in the county. The methods used for manure management in Maramureș County are presented in Table 6.

Table 6. Methods used for manure management.

Variable		Total (n=350)		Țara Lăpușului (n=30)		Țara Codrului (n=51)		Țara Chioarului (n=103)		Țara Maramureșului (n=166)		p
		no.	%	no.	%	no.	%	no.	%	no.	%	
Manure management	Sewage system	30	8.6	2	6.7	17	17.6	8	7.8	11	6.6	<0.094
	Concrete platform	136	38.9	14	46.7	23	45.1	39	37.9	60	36.1	<0.5

3.6. Constraints identified in the study area

The constraints farmers face include natural, technological or bureaucratic constraints. Natural ones refer to plot fragmentation, soil productivity, flooding or massive deforestation. The list of constraints is completed by the lack of integrated supply chains, uncompetitive prices or outdated machinery fleets. Significant differences between regions were obtained in the case of massive deforestation and floods, more pronounced in Țara Maramureșului and Țara Lăpușului. Even though the county benefits from extensive forested areas, deforestation is commensurate. There is a correlation between the frequency of deforestation and the frequency of flooding, with the statistical calculation indicating a $p<0.001$ for this situation.

Table 7. Natural or specific constraints facing Maramureș County.

Variable	Total (n=350)		Țara Lăpușului (n=30)		Țara Codrului (n=51)		Țara Chioarului (n=103)		Țara Maramureșului (n=166)		p
	no.	%	no.	%	no.	%	no.	%	no.	%	
Soil productivity	72	20.6	36	21.7	25	24.3	8	15.7	3	10.0	<0.3
Deforestation	127	36.3	13	43.3	4	7.8	19	18.4	91	54.8	<0.001
Flooding	46	13.1	5	16.7	1	2.0	4	3.9	36	21.7	<0.001
Lack of information	215	61.4	25	83.3	33	64.7	65	63.1	92	55.4	<0.03
Lack of integrated chains	35	16.7	2	13.3	6	17.1	13	20.6	14	14.6	<0.3
Land fragmentation	70	33.5	6	40.0	11	31.4	17	27.0	36	37.5	
Outdated machinery fleet	15	15.8	3	20.0	3	8.6	13	20.6	14	14.6	
Non-competitive prices	41	19.6	3	20.0	5	14.3	14	22.2	19	19.8	

In order to minimise these constraints, it is necessary to continue financing farm development measures and to increase the budget for afforestation measures while relaxing the conditions for their contracting. From a bureaucratic and institutional point of view, the most frequently reported problem is the lack of information (83.3%), presenting concerns in terms of contracting measures and compliance with requirements. The main natural or specific constraints facing Maramureș County are detailed in Table 7.

4. CONCLUSIONS

The research focused on assessing the state of implementation of the Common Agricultural Policy in Maramureș County and the impact of this policy on the

environment. This evaluation has been carried out by monitoring the financial support provided through the National Rural Development Programme for the period 2007-2023 and the results achieved. Natural and specific constraints faced by farmers have also been identified with a view to setting the necessary adjustments for the new Common Agricultural Policy. Research results show that the county can be divided into four regions (Țara Maramureșului, Țara Lăpușului, Țara Chioarului and Țara Codrului), not only from a historical-ethnographic point of view, but also according to relief, agricultural system or the type and size of farms. Țara Chioarului and Țara Codrului meet the necessary conditions for intensive agriculture, while traditional agriculture predominates in Țara Maramureșului. Țara Lăpușului is a transition area between intensive and traditional agriculture.

The results obtained show common features with those obtained in other European regions, which demonstrate similarities in the effectiveness of greening measures at EU level. The evaluation of the programme found that CAP measures have not led to significant changes in farming practices and environmental benefits are not significant. Regarding measures, a high frequency was found for measures M 10 and M 13, where requirements are modest, as it is also the case for measure M 10, or non-existent for measure M 13. The conditions for crop diversification and introduction of ecological focus area were met by a small number of farmers, 14.2% and 7.7% respectively. Only 6.3% say they have changed their farming practices as a result of greening measures. Given the fact that 96.6% of farmers reported spending less than 30% of the amount of subsidies received for the implementation of environmental measures, the cost-benefit ratio is unfair and subsidies for greening measures remain, in essence, still a direct payment to farmers.

An exact comparison between different regions in the country or in Europe in terms of the applicability of voluntary measures is challenging due to the specific conditions in certain counties or even within counties. Therefore, this study should be repeated in various parts of the country or in the European Union in order to fill the gaps in the literature, which has focussed mainly on the effects of the implementation of the greening scheme. Essentially, the environmental aim of the CAP is the same, even if the requirements or packages of measures may differ.

In the process of agricultural development, farmers face the following constraints: fragmentation of plots, reduced soil productivity, outdated machinery, lack of integrated supply chains or uncompetitive prices. The constraints faced by the area and the modest results provided by greening measures mean that major changes in the Common Agricultural Policy approach are needed, both at national and European level. One of the necessary changes concerns the reduction of the arable areas for which crop diversification is applied from ten to three hectares, as foreseen in the legislative proposal for the 2014-2020 period. Also, in the case of the condition for the introduction of the EFA, the arable area for the limit of occurrence should be reduced from 15 to 10 hectares.

In order to increase the performance of the latter requirement, only non-producing ecological focus area should be accepted, otherwise this condition could be met by main crops without requiring changes in farming practices. This will bring a much larger number of farms under the greening scheme and the environmental benefits will be greater than at present. Given the share of land with high nature value in Maramureș county (80%) and the integrated farming system that prevails in the area, these changes will not require major efforts from farmers. The stringent requirements will change farmers' perceptions of the purpose of CAP payments, which they see as a direct payment, but these changes will also make them more aware of the link between the environmental and economic components. Even if the constraints and needs differ from one area to another, these changes are absolutely necessary across the EU, and the results will be reflected in the quality of the environment, contributing to the objectives of the European Green Deal for the agricultural sector (European Council, n.d.b).

For the new Common Agricultural Policy (2021-2027), a transition period (2021-2023) has been foreseen, during which the same measures have roughly been in place as in the 2014-2020 period, an assessment of this is premature at this stage. The new reform, with new environmental and climate innovations and changes, will therefore be subject to an evaluation towards the end of the implementation period.

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