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## FARMERS' ATTITUDES TO IMPLEMENTATION OF CAP GREENING PRACTICES IN BOTH THE BLAGOEVGRAD AND KYUSTENDIL REGIONS IN BULGARIA<sup>4</sup>

*The Common agricultural policy (CAP) is the most integrated policy that offers an opportunity for the agricultural sector to respond to society's demands in terms of food security, safety, quality and sustainability as well as environmental care. New agriculture challenges in the framework of EU political priorities and greening of the sector are related to the implementation of three key objectives based on encouragement of a smart and sustainable agricultural sector; improving environmental care and climate change action; improving socio-economic role of rural areas. The study aims to research the farmers' attitudes implementation of ecological practices on farms using conjoint analysis, correlation analysis, SWOT analysis and descriptive analysis. The conjoint analysis answers a fundamental research question – would farmers carry out ecological practices without CAP support? In addition, we analyzed farmers' attitudes toward implementing mandatory and voluntary ecological practices in farms with or without CAP financial support. The study results confirm the research hypothesis that CAP greening is carried out at the cost of CAP payments. It was found that farmers would not carry out ecological practices without the CAP financial support during the 2023-2027 programming period in both the Blagoevgrad and Kyustendil regions in Bulgaria.*

*Keywords: CAP greening payments; farmers' motivation; conjoint analysis*

*JEL: Q10; Q12; Q15*

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## 1. Introduction

Agriculture in the European Union (EU) is an important sector producing primary agricultural products in the World. The sector guarantees the food security of over 500 million European citizens and is important for providing agricultural and food products to the population of every EU Member State as well as other countries like the USA, Japan, China, Saudi Arabia etc.

Common agricultural policy (CAP) greening and its impact on the environment have become increasingly important in recent years. In the literature authors research and assess the impact of CAP agri-environmental and environmental measures in different EU Member States (Lapka et al., 2011; Mészáros et al., 2015; Gocht et al., 2017; Bertoni et al., 2018; Díaz-Poblete et al., 2021; Quero et al., 2022; Sauquet, 2022). Some authors consider a social contribution (Czyzewski et al., 2018), which is important for rural development and socio-economic processes (Dudek, Wrzochalska, 2019).

Having in mind all of the above we find it of significant importance to understand and the farmers' attitudes to the implementation of CAP greening practices. This study aims to find if sustainable environmental practices would be continued if there is a lack of funding, or if the main reason for them to have any ground in Bulgaria is because of the monetary support.

Climate change and environmental decline are an existential threat to Europe and the world that has the potential to have a long-lasting effect on the food chain and sustainability of the production environment. To overcome these challenges, the European Green Deal aims to improve the well-being and health of citizens and future generations by providing:

- fresh air, clean water, healthy soil and biodiversity;
- renovated, energy-efficient buildings;
- healthy and affordable food;
- more public transport;
- cleaner energy and cutting-edge clean technological innovation;
- longer lasting products that can be repaired, recycled and re-used;
- future-proof jobs and skills training for the transition;
- globally competitive and resilient industry and is in line with the Sustainable Development Goals (SDGs).

In relation to addressing the challenges, many authors have researched the CAP environmental challenges (Yovchevska, 2021; Ziętara, Mirkowska, 2021) and “green” transformation (Pawłowska, Grochowska, 2021). Other authors (Chiripuci, et al., 2022) research opportunities under the EU Green Deal through strategies to raise consumer awareness of the socio-economic and environmental benefits of consuming organic food.

In this regard, national regulations were harmonized with the EU legislation before Bulgaria entered membership. The 2008 introduction of environmental principles includes

recommendations for keeping traditional breeds and varieties, biodiversity, and animal protection (Bashev, 2008). Nutrient losses in the soil, biodiversity loss, negative impacts on the landscape features, and soil surface conditions were found, including in Bulgaria.

Growing criticism of intensive agricultural activities that damage natural resources and threaten biodiversity gradually increased environmental restrictions on farming activities with the introduction of CAP greening. The purpose was to save environmentally vulnerable areas, enhance groundwater, establish and sustain organic farming, and minimize the use of chemicals (Lamine, 2011).

Bulgaria implemented green direct payments on January 1st, 2015. The payment mechanism is made more ecologically friendly through CAP greening. Via the CAP greening payments, farmers use their land sustainably and protect natural resources daily to have the chance to profit financially. The CAP greening scheme seeks to guarantee that all EU farmers receiving income assistance engage in farming activities that positively impact the environment and the climate.

The CAP greening was intended to motivate farmers to save habitats and biodiversity on farms. Farmers' decisions and the ethical management approaches they use on their farms are key to biodiversity conservation. These choices are also related to growing specialization and intensification of production in some regions, which causes farmland to be abandoned. It severely negatively influences biodiversity, hurting soil, climate, and water.

In order to achieve the CAP objective of CAP greening payments, three agricultural activities are climate- and environment-friendly:

- crop diversification,
- maintaining permanent grassland, including traditional orchards where fruit trees are cultivated in low densities on grassland,
- maintaining at least 5% of lands as ecological focus areas.

In detail, the requirement for crop diversification applies to farms with between 10 and 30 hectares of arable area. These farms must grow at least two different crops, and the primary crop can occupy up to 75% of arable area. A farm with more than 30 ha of arable area must grow at least three different types of crops, and the primary crop can occupy up to 75% of the arable area, and the combined area of the two main crops can be up to 95% of arable area.

The requirement for diversification does not apply when more than 75% of arable land was used to grow grass or other grass feeds, is fallow land, or was combined with other uses, but only if the remaining arable land (i.e., the land that was not used for these reasons) does not exceed 30 ha. When more than 75% of the agricultural area is permanent grassland, is used to grow crops underwater, or is subject to a mix of these uses, the requirement for diversification does not apply as long as the amount of arable land not used for these reasons does not exceed 30 ha (Regulation 1307/2013).

Following some significant restrictions that farmers must comply with, the requirement to keep permanent grassland follows. According to the Agricultural Producers Support Act in Bulgaria, permanent grassland included in the "permanent grassland" layer and is

ecologically vulnerable must not be ploughed or otherwise altered. The ecological focus areas aim to protect and enhance agricultural biodiversity. They are a component of the applied CAP targeted at sustainable management of natural resources, including biodiversity, and the requirements of CAP greening. Farmers who adopt activities that enhance biodiversity are rewarded with incentive payments (APSA 102/2022).

A common problem, among farmers, has been identified in Bulgaria which is the application of ecological practices in farms without financial incentives. Until 2022 CAP greening encourages farmers to implement ecological practices in their farms that contribute to the protection of the environment but with CAP support.

In the literature regarding this problem, three interrelated factors were defined that influence motivation: internal forces, directing behaviour towards specific goals and maintaining motivation through the interaction of internal and external forces. Internal forces are influenced by traditional practices and lifestyles, implementation of conservation practices to protect the environment (Greiner et al., 2009; Mills et al., 2018) and biodiversity conservation (Farmar-Bowers et al., 2008). External forces are influenced by economic and financial incentives, such as subsidies, incomes and investments (Greiner et al., 2009).

Some authors (Mills et al., 2018) found that farmers' motivation to do agricultural and environmental activities was determined by economic, social and environmental factors. Economic benefits link to financial encouragement, income satisfaction, good profit and subsidization. Social benefits include prestige, creative outdoor work, preservation of valuable traditions, preservation of rural communities and rural development, as well as personal health and quality of life. Environmental benefits include environmental conservation practices such as preserving soil fertility and minimizing environmental impact, as well as the inclusion of intercropping, green cover, green manuring to protect soil from erosion and water management in irrigation systems, buffer strips between individual parcels and reservoirs. Another very important benefit is obtaining clean, quality and nutritious food which results from a responsible ecological attitude towards the environment. The preservation of biodiversity in farms, as well as its preservation, which is primarily a personal motive, and not a business motive, can also be referred to this group.

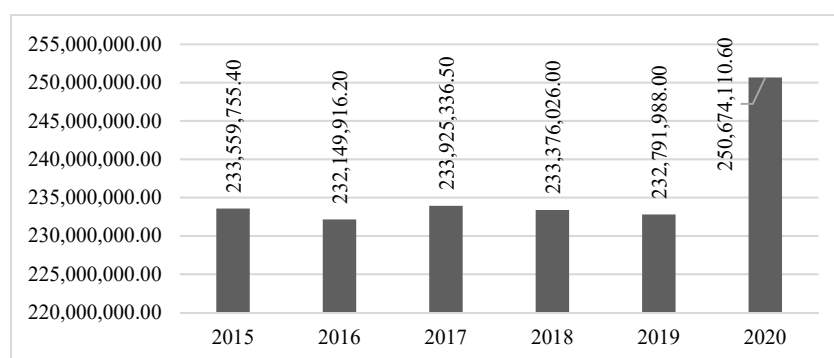
In the context of the Common Agricultural Policy (CAP) and agricultural practices, green practices generally refer to environmentally friendly and sustainable approaches that aim to minimize negative impacts on the environment and promote ecological balance.

In the former Pillar 2 of the CAP, there were indeed supported agroecological measures. Agroecology is an approach to farming that emphasizes the integration of ecological principles into agricultural systems. It seeks to promote biodiversity, soil health, water conservation, and the reduction of chemical inputs. Agroecological measures under the CAP often included support for organic farming, conservation agriculture, agroforestry, and the adoption of sustainable farming techniques. The budget for CAP Pillar 2 Greening measures has increased but as relative share from 2015 till 2020 it varies no more than 4%, around 30-33% of CAP budgeting is allocated for greening (Figure 1).

Applying the new CAP 2023-2027 aims to be greener, fairer, and more competitive through meeting much stronger requirements arising from the European Green Deal (EC, 2023).

Regarding CAP greening activities are directed towards higher green ambitions, contributing to the Green Deal targets, enhanced conditionality, eco-schemes, rural development, operational programmes, climate and biodiversity.

**Figure 1. Expenditure greening budget Pillar II**



Source: Eurostat.

However, it's worth noting that the CAP has undergone some changes and reforms over time, and the specific measures and definitions may vary. The latest CAP reform, which took effect in 2021, introduced a new architecture with three main objectives: environmental care, climate action, and balanced territorial development. Under these objectives, member states have more flexibility in designing their programs and selecting measures to meet their specific needs and challenges, including those related to green practices.

Eco-schemes, in their essence, are supported by various voluntary acts that go beyond conditionality and other pertinent responsibilities, such as behaviours connected to better nutrient management, agroecology, agroforestry, carbon farming, or animal welfare. Similar to how certain payment types under the CAP's second pillar are supported.

In terms of applying direct payments to ensure a minimum level of protection and basic obligations directly related to climate issues, farmers must comply with mandatory cross-compliance requirements. The cross-compliance aims for farmers to comply with high EU standards for public, plant, and animal health and welfare, and the environment (Regulation 2021/2116), as an improving sustainable European farming. Farmers must comply following rules:

- statutory management requirements (SMR), these apply to all farmers whether or not they receive support under the CAP;
- good agricultural and environmental conditions (GAEC), these apply only to farmers receiving support under the CAP.

Both standards should better consider the environmental and climate challenges and the new CAP environmental architecture, thus delivering a higher level of environmental and climate ambition as set out in the Commission communication on the "Future of Food and Farming" (Regulation 2021/2116).

Mainly SMR and GAEC standards are distributed as follows (Regulation 2021/2116):

- Climate change:
  - GAEC 1: Maintenance of permanent grassland – the aim is a general safeguard against conversion to other agricultural uses to preserve carbon stock,
  - GAEC 2: Protection of wetland and peatland – the aim is the protection of carbon-rich soils,
  - GAEC 3: Ban on burning arable stubble, except for plant health reasons – the aim is the maintenance of soil organic matter.
- Water:
  - SMR 1: Establishing a framework for Community action in the field of water policy – the aim is to control diffuse sources of pollution through phosphates,
  - SMR 2: Protection of waters against pollution caused by nitrates from agricultural sources – the aim is the protection of water,
  - GAEC 4: Establishment of buffer strips along water courses – the aim is the protection of river courses against pollution and run-off.
- Soil:
  - GAEC 5: Tillage management, reducing the risk of soil degradation and erosion, including consideration of the slope gradient – the aim is minimum land management reflecting site-specific conditions to limit erosion,
  - GAEC 6: Minimum soil cover to avoid bare soil in periods that are most sensitive – the aim is the protection of soils in periods that are most sensitive,
  - GAEC 7: Crop rotation in arable land, except for crops growing underwater – the aim is preserving the soil potential,
- Biodiversity and landscape:
  - SMR 3: Conservation of wild birds – the aim is to protect biodiversity,
  - SMR 4: Conservation of natural habitats and of wild flora and fauna – the aim is to protect biodiversity,
  - GAEC 8: Protection of agricultural areas devoted to non-productive areas or features – the aim is maintenance of non-productive features and areas to improve on-farm biodiversity,
  - GAEC 9: Ban on converting or ploughing permanent grassland designated as environmentally-sensitive permanent grasslands in Natura 2000 sites – the aim is the protection of habitats and species,
- Food safety

- SMR 5: Laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety – the aim is food safety and people protection,
- SMR 6: Prohibition on the use in stock-farming of certain substances having a hormonal or thyrostatic action and beta-agonists – the aim is food safety, people and animal protection,
- Plant protection products:
  - SMR 7: Placing of plant protection products on the market – the aim is people's health and saving the environment,
  - SMR 8: Establishing a framework for Community action to achieve the sustainable use of pesticides – the aim is restrictions on the use of pesticides in protected areas,
- Animal welfare:
  - SMR 9: Laying down minimum standards for the protection of calves – the aim is food safety, people and animal protection,
  - SMR 10: Laying down minimum standards for the protection of pigs – the aim is food safety, people and animal protection,
  - SMR 11: Protection of animals kept for farming purposes – the aim is food safety, people and animal protection.

In the context of CAP greening, we show in detail “Schemes for the climate, the environment and animal welfare” (eco-schemes) including the following practices in Bulgaria (Ministry of Agriculture, 2023):

- Eco-scheme by organic production;
- Eco-scheme by maintenance and improvement of biodiversity and environmental architecture;
- Eco-scheme by preservation and restoration of soil potential – encourage green manure and organic fertilization;
- Eco-scheme by reducing pesticide use;
- Eco-scheme by ecological maintenance of perennial crops:
  - ecological interrow maintenance with nitrogen-fixing or grass crops;
  - ecological maintenance of strips with natural vegetation on the edge-of-fields;
- Eco-scheme by extensive permanent maintenance;
- Eco-scheme by biodiversity maintaining and improving in forest ecosystems;
- Eco-scheme by grown cultures diversification has some requirements as follows:
  - farms with arable land up to 10 ha have to grow at least 2 different crops – the main crop not exceeding 90% of these areas;

- farms with arable land between 10-30 ha have to grow 3 different crops – the main crop not exceeding 75% of these areas, and the 2 main crops together covering not more than 90% of them;
- farms with arable land over 30 ha have to grow at least 4 different crops – the main crop not exceeding 75% of these areas, and the 3 main crops together covering not more than 90% of them.

A key tool in reaching the ambitions of the European Green Deal is the Farm to Fork strategy aimed at achieving a greener and more sustainable Common Agricultural Policy (CAP) in the European Union (EU). The strategy was launched as part of the European Green Deal, which is a comprehensive plan to make the EU's economy sustainable and address climate change and environmental challenges.

The Farm to Fork Strategy aims to transform the EU's food systems by promoting sustainable agricultural practices, reducing the use of pesticides and antimicrobials, increasing organic farming, improving animal welfare, and promoting healthy and sustainable diets. It recognizes the need to align agricultural policies with environmental objectives and support the transition to more sustainable farming systems.

By implementing the Farm to Fork Strategy, the EU aims to reduce the environmental footprint of the agricultural sector, mitigate climate change, protect biodiversity, and improve the overall sustainability of food production and consumption. It recognizes the interconnectedness between agriculture, environment and human health and emphasizes the importance of sustainable practices throughout the food supply chain.

The Farm to Fork Strategy can contribute to a greener CAP policy by setting ambitious targets and guidelines for member states to follow. It provides a framework for aligning agricultural policies with sustainability objectives and encourages the adoption of green practices at various stages of food production, processing, and distribution.

By promoting sustainable farming techniques, reducing the use of chemicals, supporting organic farming, and encouraging more sustainable diets, the Farm to Fork Strategy can help steer the CAP towards a greener and more environmentally friendly approach. It also emphasizes the importance of research, innovation, and knowledge sharing to support the transition to sustainable food systems.

Also, an important part of the CAP Strategic plan is the financial annexe (EC, 2020) which includes some directions as the following:

- Direct payments € 4 118 959 730, like all of them, are from the EU budget;
- Sectoral support € 124 825 769, like € 109 346 634 are from EU budget;
- Rural development € 3 481 928 072, like € 1 411 630 215 are from the EU budget.

Regarding environmental and climate objectives under rural development are reserved € 547 115 007, and for Eco-schemes under direct payments are reserved € 1 026 589 665 from the EU funding budget.



## **2. Methodology and Data**

For the purpose of this study, we will be using "Conjoint analysis". The term "conjoint" was introduced as "conjoint measurement" in the 1970s. According to some authors (Green et al., 1971), it is decisive for the development of mathematical psychology. It can be used to measure the combined effects of a set of independent variables on the ordering of a dependent variable. They were applied to illustrative problems in marketing. In addition, many applications to marketing research were discussed, as well as some of the limitations of the methodology.

Conjoint analysis is used as a decision-making tool by evaluating different decision-making options (Van Soest et al., 2015) and determining the most acceptable one through a theory of discrete choice (Louviere, 1988; Seghieri et al., 2014). The analysis is the most used in consumer choice research (Szűcs et al., 2015) as well as in consumer attitudes (Lucas et al., 2019). The conjoint analysis and related choice modelling methods have been used for many years in marketing research to assess consumer behaviour and preferences for different product attributes. Conjoint analysis is trending towards its application in environmental science and management (Alriksson et al., 2008). The Conjoint analysis has been used in marketing (Green et al., 1981; Gustafsson et al., 2007; Rao, 2013; Zhelev, 2011), healthcare (Ryan et al., 2000; Spaich et al., 2018), agricultural economics (Menapace et al., 2011); environmental economics (Opaluch et al., 1993; Alriksson et al., 2008), (Campbell et al., 2009), climate change (Alberini et al., 2006); quality management (Steenkamp, 1987), tourism (Anastasova, 2003; Karadzova et al., 2013), as well as transport studies (Sheldon et al., 1982).

At the heart of the Conjoint analysis is the idea that each decision is composed of separate attributes and each of them from different levels. By comparing different decisions with combinations of different levels of utilities, it can be determined which of them satisfies the largest number of farmers to the greatest extent. The method is applied to classify decisions by preference degree and determining optimal levels of their attributes. The main advantage of the method is the possibility to compare their set of diverse decisions (Pelzer, 2019). In this way, conditions are simulated to imitate a real situation in which farmers are placed when they have to make a choice between different alternatives and make a management decision.

We have chosen the Conjoint analysis by IBM SPSS Statistics 19.0 software to research farmers' attitudes towards implementing ecological practices on farms. The method is suitable for the study because new CAP greening requirements can be divided into groups, as well as the level of subsidy. The conjoint analysis provides an answer to a very important question „Would farmers carry out ecological activities without the CAP support?“.

Entering the data into SPSS and outputting the Conjoint analysis led to determining the number of levels and characteristics that applied in the set from which farmers had a choice of preference, i.e. three levels of eco-schemes and five levels of subsidy per hectare.

The attributes and levels at which farmers should indicate the most preferred option are presented (Table 1). The attributes represent main factor groups including eco-schemes and subsidy per hectare and levels represent a section of each attribute.

**Table 1. Determination of attributes and levels by the Conjoint analysis**

<b>Levels</b>	<b>Attributes – Eco-scheme</b>
Level.1	Preserving carbon-rich soils through the protection of wetlands and peatlands
Level.2	Implementation of a nutrient regulation tool to improve water quality and reduce ammonia and nitrous oxide levels
Level.3	Crop rotation
<b>Levels</b>	<b>Attributes – Subsidy/ha</b>
Level.1	BGN 0
Level.2	BGN 100
Level.3	BGN 150
Level.4	BGN 200
Level.5	BGN 250

*Source: Authors' own elaboration.*

"Eco-schemes" attribute belongs to levels: preserving carbon-rich soils through the protection of wetlands and peatlands; implementation of a nutrient regulation tool to improve water quality and reduce ammonia and nitrous oxide levels; crop-rotation. The "Subsidy per hectare" attribute includes the following levels: BGN 0, BGN 100, BGN 150, BGN 200, BGN 250. The possible selection combinations are formed by conjoint analysis conditions. In this regard, we defined 15 question cards which farmers have to evaluate according to ranking method where 1 is the most preferred option and 15 is the least preferred option.

In addition, correlation analysis aims to supplement the conjoint analysis. The correlation analysis provides a solution to the relationship between two or more phenomena and is non-coincidental in how strong and close the relationship is between the studied phenomena (Luo et al., 2019). In statistics, there is a correlation coefficient that measures the relationship between two random variables and correlation analysis tests the hypothesis of a non-random relationship between the variables. It gives an answer to the question of whether two or more variables are associated or connected. Often, the analysis examines how two or more variables relate to each other or how one or more variables predict another variable. Studying the relationship between two or more variables is a fundamental approach for researchers in economics, psychology, medicine, cognitive science, sociology, etc. The correlation analysis was used in addition to the conjoint analysis to establish the degree of correspondence between causes and effects.

In addition to both analyses, we did a SWOT analysis which assesses future threats and identifies potential solutions (Stoyanova, Harizanova, 2016). In the literature, the SWOT analysis is indicated as a tool that supports strategic decisions (Shadbolt, 2008). It is used to analyze synergies between policy and land management (Mihailova, Yovchevska, 2021) and the situation of managing farms to explore the possibilities of implementing the objectives. Also, the SWOT analysis identifies the internal and external farm environment. The internal environment involves identifying the strengths and weaknesses of the farm, and the external environment, on the other hand, involves identifying the opportunities and threats facing the farm.

In addition, the advantages and disadvantages of using SWOT analysis are as follows (Sarsby, 2016):

- the first advantage is that the analysis uses a drawn scheme that does not use mathematical methods;
- the second advantage is that the analysis applies at many organizational levels;
- the third advantage is that the analysis is very well presented visually, which makes it easy to present to the audience.

The disadvantages are presented through two examples:

- the first disadvantage is that the analysis uses a body of data that is assumed to be the preferences, perceptions or beliefs of the research participants;
- the second shortcoming is that the analysis elements are not separated from the data collection, evaluation and subsequent decision-making stage.

In addition, we did a descriptive analysis to show in detail the studied farms. Descriptive analysis characterizes the main parameters of the study. It applies in addition to conjoint and correlation analysis and uses extracted data from the survey.

In connection with the application of the above methods, we decided to test the following research hypotheses:

H1: Farmers are weakly dependent on receiving CAP support from agriculture.

H2: In the new programming period 2023-2027, farmers choose to implement well-known practices in past experience.

H3: Farmers are motivated to implement ecological practices without the CAP financial support.

H4: Farmers' attitudes aimed more so than at applying ecological practices that CAP payments.

H5: Farmers' decisions weren't influenced by family.

H6: Agriculture services influence the farmers' decision-making process.

### **3. Results**

For the research aims, a survey was conducted among 1079 farmers from Blagoevgrad and Kyustendil regions in Bulgaria in the period 2019-2021. Also, 51% of farmers are from the Blagoevgrad region, and 49% of them are from the Kyustendil region.

Managers and owners of farms from both regions that participated in the study are divided as follows:

- 56% of farmers were men;
- 44% of farmers were women.

The age groups are divided as follows:

- 17 % – 20-30 years;
- 35 % – 30-40 years;
- 27 % – 40-50 years;
- 20 % – 50-60 years;
- 1 % – over 60 years.

The education groups are divided as follows:

- 5 % – Primary school;
- 53 % – Secondary school;
- 42 % – High school.

The research data has been processed and additionally, farms have been divided into four groups by CAP greening requirements (Table 2).

**Table 2. Farm groups in accordance with the CAP greening requirements in Bulgaria**

Farm groups	Diversification with 2 crops	Diversification with 3 crops	Maintenance 5% ecological focus areas
0-10 ha	<i>Green by definition</i>		
10-15 ha	+	-	-
15-30 ha	+	-	+
over 30 ha	-	+	+

*Source: Authors' own elaboration.*

The first group includes farms with arable land up to 10 ha – the requirements for CAP greening do not apply to them. These farms are considered "green by definition", including both organic and perennial farms, also they receive CAP greening payments by default. The second group includes farms with arable land from 10 ha to 15 ha which should meet the requirement for diversification of at least two crops. The third group includes farms with arable land from 15 ha to 30 ha, which should meet the requirement for diversification of at least two crops and the inclusion minimum of 5% as an ecological focus area. The fourth group includes farms with arable land over 30 ha, which should meet the requirement for diversification of at least three crops the inclusion minimum of 5% as an ecological focus area.

We note that all farm groups participated in the study. Also, the largest group includes farms with arable land between 10 and 15 ha, and the smallest group includes farms with arable land up to 10 ha. We researched the share of annual CAP payments that farmers receive, which showed farmers' dependence on CAP subsidies. In this regard, 56% of farmers are dependent on receiving CAP support from agriculture, and 17% are low-depend.

In the survey participated farmers from both regions. They are classified as follows in Table 3.

**Table 3. Farm groups participated from both regions in Bulgaria**

Farm groups	Share of farms in the survey
0-10 ha	3%
10-15 ha	37%
15-30 ha	31%
over 30 ha	29%

Source: Authors' own elaboration.

In addition, we researched indicative rates and the number of farmers applying under the Green Direct Payments Scheme for seven years (Table 4). The payments under this scheme have been applied since 2015. The total amount paid out yearly under the scheme is about BGN 450 million, and the total number of farmers is about 50-60 thousand.

**Table 4. Indicative rates under the Green Direct Payments Scheme in Bulgaria for seven years**

Year	Indicative rate (BGN/ha)	Farmers (number)
2015	127,21	52 450
2016	126,17	54 827
2017	124,01	56 972
2018	122,84	58 072
2019	122,67	56 490
2020	133,82	54 650
2021	121,63	56 425

Source: State fund Agriculture and Ministry of Agriculture.

In the research, we use the Conjoint analysis as a decision-making tool. Based on the survey, the analysis can show the extent of implementation of ecological practices on farms, the most satisfied practices, and payments level for farmers to carry out ecological practices on farms, and the extent of interest in environmental goals during the new programming period 2023-2027. We determine the levels and characteristics (Conjoint analysis) and a survey with farmers. After that, we summarize and present the results of applying the Conjoint analysis (Table 5). The analysis shows us that the higher the utility coefficient, the more preferred the respective ecological practice.

**Table 5. Results from Conjoint analysis in both regions**

Attributes	Levels	Utility Estimate	Std. Error
Eco-scheme. 1	Preserving carbon-rich soils through the protection of wetlands and peatlands	0.251	0.002
Eco-scheme. 2	Implementation of a nutrient regulation tool to improve water quality and reduce ammonia and nitrous oxide levels	0.566	0.004
Eco-scheme. 3	Crop rotation	1.259	0.003
Subsidy/ha. 1	BGN 0	1.354	0.002
Subsidy/ha. 2	BGN 100	4.731	0.003
Subsidy/ha. 3	BGN 150	9.653	0.005
Subsidy/ha. 4	BGN 200	15.354	0.007
Subsidy/ha. 5	BGN 250	18.093	0.010

p<0.05

Source: Authors' own elaboration.

Farmers' attitudes toward choosing eco-schemes during the new programming period 2023-2027 on crop rotation were focused, with this being the most preferred ecological activity and the least preferred being preserving carbon-rich soils through the protection of wetlands and peatlands. This preference is, to some extent, due to knowledge of "crop rotation" practice and its application in experience (by other RDP measures) from a financial point of view. While some other practices still need to be discovered by farmers, this is a reason that they do not prefer to implement them on their farms.

Regarding farmers' attitudes about CAP payments received for these ecological practices, it is clear that a considerable part of them choose to implement the practices against receiving higher CAP payments, and a tiny part of them would choose not to receive CAP payments for the ecological practices they perform. Also, we found that farmers rated CAP payment as a much more important factor than ecological practices. Despite that, 79% of farmers believe that the decisions to implement ecological practices on farms have a positive impact on improving the environmental status of both regions. We highlight the difference between importance coefficients that determine the farmers' attitudes (Table 6), and the correlation between hypothetical and predicted preferences is very strong.

**Table 6. Factors determining farmers' attitudes in both regions**

Attributes	Importance Values
Ecological practices	13.215
CAP greening payments	86.785

*Source: Authors' own elaboration.*

The Correlation analysis is an undivided part of Conjoint analysis which examines the relationships between two variables by establishing the extent of correspondence between causes and effects. We have made connections between different questions from the questionnaire, which establish the reasons motivating farmers to apply ecological practices on farms.

The first connection (Table 7) is to what extent family influence on farmers' decision-making and decisions have an impact on improving ecological practices for the two regions. From the analysis, we found that there is a weak relationship. It is important to note that family did not influence, but agricultural services influenced the farmers' decisions to a large extent.

**Table 7. Correlation between family influence and impact on improving ecological practices in both regions**

		Family influence on the decision-making process	Improving the ecological condition of the regions
Family influence on the decision-making process	Pearson Correlation	1.000	0.056
	Sig. (2-tailed)		0.108
	N	1002	1002
Improving the ecological condition of the regions	Pearson Correlation	0.056	1.000
	Sig. (2-tailed)	0.108	
	N	1002	1035
p<0.01			

*Source: Authors' own elaboration.*

The second connection (Table 8) is whether has a relationship between the share of annual CAP payments and the implementation of CAP greening practices. From the analysis, we found no connection between the two variables.

**Table 8. Correlation between annual CAP payments and implementation of CAP greening in both regions**

		Annual CAP payments	Implementation of CAP greening
Annual CAP payments	Pearson Correlation	1.000	-0.243
	Sig. (2-tailed)		0.003
	N	1073	1065
Implementation of CAP greening	Pearson Correlation	-0.243	1.000
	Sig. (2-tailed)	0.003	
	N	1065	1073
p<0.01			

Source: Authors' own elaboration.

Also, we found that each of the mentioned sources has an influence to a greater or lesser extent on the decisions of agricultural producers. To a greater extent, experts from the Municipal agriculture office, National agricultural advisory services and private consultants influence the farmers' decision-making process, and to a lesser extent – the Regional agriculture directorate, other agricultural producers, and agro sites.

In the second part of the research, we have determined the questions related to the new programming period 2023-2027, which aims to show farmers' attitudes towards the upcoming eco-scheme practices. We need to study their attitudes regarding the implementation of mandatory and voluntary ecological practices.

We found that 97% of the farmers are interested in new ecological practices (eco-scheme) set during the programming period 2023-2027. We also found that 53% of them expect to continue with the CAP greening payment for the implementation of ecological practices and will not be lowered the rates per hectare. Another 35% of the farmers expect increased rates per hectare and increased eco-scheme payments. Another 17% of them expect a greater choice of ecological practices and increased control over their implementation, i.e. to achieve screening of actual farmers who engaged in agriculture. Only 5% of them shared that they expect the environmental state of regions to improve.

Also, we found that 65% of farmers are concerned that the bureaucracy will be maintained, and 23% are worried about the control applied during the meeting requirements of the new eco-scheme. According to 44% of farmers, the requirements under the eco-scheme payments will be increased, and for 61% of them – the eco-scheme payments will be reduced, which will negatively impact farm activities.

We present farmers' attitudes: 95% of them indicated that they would implement the eco-scheme in the programming period 2023-2027 but with CAP financial support. Also, 76% of farmers indicate that the CAP greening payments motivate and support them in implementing ecological practices on farms.

In farmers' attitudes analysis, we determined that most of them would implement ecological practices on farms but with CAP financial support providing additional income through meeting eco-scheme requirements.

In addition, in the farmers' attitudes analysis regarding the introduction of mandatory ecological practices on farms, we found that farmers at greater extent prefer the introduction of the practice of "Preserving carbon-rich soils through protection of wetlands and peatlands" to practices "Implementation of a nutrient regulation tool to improve water quality and reduce ammonia and nitrous oxide levels" and "Crop rotation" from an ecological point of view (Table 9).

**Table 9. Farmers` attitudes regarding the introduction of mandatory ecological practices on farms during the new programming period 2023-2027 in both regions**

Mandatory ecological practices	N	Minimum	Maximum	Mean
Preserving carbon-rich soils through the protection of wetlands and peatlands	1075	1.00	5.00	3.68
Implementation of a nutrient regulation tool to improve water quality and reduce ammonia and nitrous oxide levels	1075	1.00	5.00	3.21
Crop rotation	1075	1.00	5.00	2.95
Valid N (listwise) 1075				

*Source: Authors' own elaboration.*

Also, in the farmers' attitudes analysis regarding the introduction of voluntary ecological practices on farms, we found that farmers agree with the introduction of all four practices: "Enhanced management of permanent pastures", "Enhanced management of landscape elements and features", "Enhanced biodiversity management", "Making more ambitious commitments" (Table 10).

**Table 10. Farmers` attitudes regarding the introduction of voluntary ecological practices on farms during the new programming period 2023-2027 in both regions**

Voluntary ecological practices	N	Minimum	Maximum	Mean
Enhanced management of permanent pastures	1071	1.00	4.00	2.19
Enhanced management of landscape elements and features	1071	1.00	4.00	1.97
Enhanced biodiversity management	1071	1.00	5.00	1.74
Making more ambitious commitments	1071	1.00	5.00	1.97
Valid N (listwise) 1071				

*Source: Authors' own elaboration.*

In addition, SWOT analysis reveals the four main elements necessary for the future functioning of farms in CAP greening conditions (Table 11). Strengths and opportunities are the factors that support future farm development, and weaknesses and threats are the factors that limit favourable farm development in perspective. The analysis was based on data from the regulations, the ordinances related to CAP greening, some authors and the data derived from the surveys.

Strengths linked to the conservation and improvement of biodiversity, environment, and climate are essential to the CAP greening (eco-scheme) requirements. Through the application of practices such as diversification of monoculture production, preservation of



permanently grassed areas, and maintenance of 5% ecologically focus areas, valuable habitats are preserved, through which the loss of biological diversity in farms is reduced. By growing nitrogen-fixing crops, the soil is enriched with nitrogen, which has a favourable effect on the following crops sown after them. By leaving the land fallow for a year, the soil is given a chance to rest and restore its nutrients. Also, buffer strips protect water from chemical pollution, soil improvement, climate change, compliance with irrigation water use procedures, and protection from a direct and indirect discharge of dangerous substances into groundwater (Council Directive 91/676/EEC; Directive 2000/60/EC).

**Table 11. Application of SWOT analysis to identify the future development of farms concerning the performance eco-scheme requirements**

<b>Strengths</b>	<b>Weaknesses</b>
Maintaining ecosystem services; Climate protection; Environmental protection; Biodiversity conservation; Improving soil biodiversity; Habitats conservation; Fallow land care; Diversification of monoculture production; Preservation of permanent grassland; Maintenance of ecological focus areas including: hedgerows, trees in lines, single trees, trees in groups, anti-erosion shelterbelt of trees, field margin strips, wetlands, green-space around watercourses, terraces, woodland edge, buffer strips; Existing traditional farming practices in Bulgaria, that are in line with crop rotation, soil preservation etc; Bulgarian farmers have access to knowledge and technical expertise through agricultural extension services, research institutions, and farmer networks.	Degradation of ecosystem services; Negative effects of climate change; Environmental pollution and degradation; Loss of biodiversity; Degradation of soil biodiversity; Habitat loss; Land degradation; Monoculture production; Conversion-ploughing of permanent grassland; Lack of technical knowledge and training; Outdated infrastructure and equipment; Fragmented land holdings; Limited access to technology and innovation; Resistance to change; Administrative burdens and compliance.
<b>Opportunities</b>	<b>Threats</b>
Implementation of cross-compliance; Participation in the Climate, Environment and Animal Welfare Schemes (Eco Schemes); Funding from the EU and opportunity for change in production and diversification of crops.; Enhancing income support; More of the consumers part of the EU market demand for sustainable products Farmers can explore collaboration opportunities with other stakeholders, such as agricultural cooperatives, processors, retailers, and certification bodies which are underdeveloped in Bulgaria; Sustainable farming practices adaptation; Collaboration between farmers and researchers can lead to innovative solutions.	Exclusion from direct payment support; Non-fulfillment of the requirements under the Climate, Environment and Animal Welfare Schemes (Eco Schemes); Decreasing income support. Agriculture in Bulgaria faces economic challenges, including fluctuating market prices, high production costs, limited financial resources, high inflation rates; The constant shift of requirements or inconsistent enforcement of eco-scheme regulations can pose challenges for farmers in adapting their practices and meeting the required standards; Climate change impacts.

Source: Authors' elaboration, developed with the survey data and regulatory framework: Regulation 2021/2115, Ordinance 3/2023, Ministry of Agriculture (2023), as well Guyomard et al. (2023), Marick et al. (2023)

Weaknesses are related to adverse effects on soils, water, climate, biodiversity, and habitats in case of incorrect application or non-compliance with the eco-scheme requirements. Failure

to meet the requirements for greening (eco-schemes) leads to all these consequences described as weaknesses in the SWOT analysis. Activities like including buffer strips to CAP greening it is already strong side compared to the previous period. This leads to the conclusion that the new requirements improved in parallel with applied practices.

The opportunities facing farmers are tied to receiving payments for implementing environmental activities on farms. It is a financial motivation that rewards the efforts and motivation to carry out good practices that protect the environment and continue these practices in the future. Another opportunity for farmers is the green payments tool to calculate the consumption for a minimum of 5% ecologically focused areas. The tool facilitates the farmers before submitting the request for payment in Municipal agricultural offices.

Threats to farmers stem from meeting the requirements under the CAP greening scheme. Farmers face the risk of sanctions for compliance with the conditions set by the scheme. The sanction may be total or partial, depending on the type and frequency of the error. One of the mistakes that can be made is an incorrect area delineation and landscape elements.

As a result of the SWOT analysis, farmers must comply with the conditions of mandatory and voluntary requirements for respecting biological diversity, the environment and climate. Also, in addition to the conditions of the CAP greening scheme, farmers must comply with applying additional ecological activities on farms during the new programming period 2023-2027.

#### **4. Discussion and Conclusion**

Based on aims implementation we show results of testing research hypotheses.

In the first step, we reject the following hypotheses:

- H1: Farmers are weakly dependent on receiving CAP support from agriculture.
- H3: Farmers are motivated to implement ecological practices without the CAP financial support.
- H4: Farmers' attitudes aimed more so than at applying ecological practices that CAP payments.

The reason for rejecting the hypothesis is that we found only 5% of farmers weakly depend on receiving CAP support from agriculture. In addition, we established that a significantly large part of farmers choose to implement ecological practices against receiving higher CAP payments. The research showed that farmers rated CAP payment as a much more important factor than ecological practices.

In the second step, we assume the following hypotheses:

- H2: In the new programming period 2023-2027, farmers choose to implement well-known practices in past experience.
- H5: Farmers' decisions weren't influenced by family.

- H6: Agriculture services influence the farmers' decision-making process.

The reason for assuming this hypothesis is that we found the most preferred to implement is crop rotation practice and the least preferred is preserving carbon-rich soils practice through the protection of wetlands and peatlands during the new programming period 2023-2027. The correlation analysis also points to a weak relationship between farmers' decisions and family influence. The research shows that agriculture services like Municipal agriculture offices, National agricultural advisory services and private consultants influence the farmers' decision-making process to a greater extent.

The farmers' attitudes analysis leads us to think that the farmers have mainly external motivation – the CAP greening payments, rather than external motivation – the environmental protection and work satisfaction performed. In addition, we found that farmers' willingness to implement mandatory practices was supplemented by farmers' willingness to implement voluntary practices.

In conclusion, the Conjoint analysis, the Correlation analysis, the SWOT analysis and the Descriptive analysis were used in the research to get to the following conclusions regarding the state of implementation of CAP greening in Bulgaria and its further use in the new CAP period. Through analyzed survey data farmers' attitudes were studied toward mandatory and voluntary ecological practices on farms with or without CAP financial support for the programming period 2023-2027 in the regions of Blagoevgrad and Kyustendil in Bulgaria.

In the study, we found that most farmers choose to implement ecological practices against receiving higher CAP greening payments. In addition, we found that farmers rated the CAP greening payments as a more important factor than ecological practices on farms. As a result, we conclude that farmers' attitudes to implementing ecological practices on farms depend on the possibility of receiving CAP support to a greater extent and not as a consequence of internal factors such as concern for personal health and environmental care.

As a result of the research, we also found that CAP greening in both regions is possible through the environmental and climate protection practices applied by Bulgarian farmers. The CAP greening payments are not intended to provide a basic income to farmers. We found that farmers would only carry out ecological practices with the CAP financial support during the new programming period 2023-2027.

We summarized in three groups the reasons that make farmers apply ecological practices in the new programming period 2023-2027 from the analyzed survey data: CAP financial support, environmental care protection, and work satisfaction performed.

Based on the analysis and the authors' opinions, we summarize that CAP greening is carried out not at the cost of awareness of the protection of the environment and public health but at the cost of CAP greening payments, which mainly motivates farmers in both regions in Bulgaria.

The agricultural sector should be stimulated to continue with environmental care through farmers, and agroecological measures aimed at developing rural areas should make farmers achieve efficient and sustainable results in their agricultural activity.

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