



**AGRICULTURAL UNIVERSITY PLOVDIV**

**FACULTY OF ECONOMICS**

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**ENVIRONMENTAL MEASURES IN THE COMMON AGRICULTURAL  
POLICY OF THE EUROPEAN UNION**

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## INTRODUCTION

The environmental challenges that emerged during the 20th century have stimulated a fundamental re-examination of human activities, particularly in relation to the ecological systems that underpin human survival. The accelerating growth of the global population requires an expansion in agricultural output to ensure food security. However, this demand poses complex challenges, as agricultural production directly relies on natural resources and significantly impacts environment. To meet growing food demands, agricultural producers have increasingly relied on synthetic fertilizers, pesticides, intensive energy use, modern machinery, and advanced technologies. While these methods enhance productivity, they also contribute to the pollution of water, air, and soil ecosystems.

The link between agriculture and the environment has become increasingly evident in recent decades, particularly in the context of global environmental challenges. Agriculture, as both a driver and a victim of environmental degradation, plays a vital role in the sustainable management of natural resources. Within the European Union (EU), the Common Agricultural Policy (CAP) serves as one of the most influential policy frameworks, not only regulating agricultural markets and ensuring food security, but also shaping land use, biodiversity conservation, and rural development. As such, it has significant implications for environmental protection and climate change mitigation.

Initially designed in the post-World War II period to increase agricultural productivity, stabilize markets, and secure farmers' livelihoods, the CAP largely overlooked the environmental consequences of intensive agricultural practices. Excessive use of chemical inputs, land conversion, monocultures, and mechanization contributed to a range of ecological challenges, including soil degradation, water pollution, biodiversity loss, and greenhouse gas emissions. These adverse impacts highlighted the urgent need for integrating environmental considerations into agricultural policymaking at the EU level.

Since the 1970s, international efforts to address environmental problems have expanded, emphasizing the imperative that economic development must not proceed at the expense of the environment. The finite nature of natural resources necessitates sustainable development strategies that preserve these resources for future generations.

Since the early 1990s, the CAP has undergone a series of comprehensive reforms aimed at promoting a more environmentally sustainable model of agriculture. These reforms reflect the EU's evolving environmental agenda and growing societal demand for green policies. Environmental measures introduced under the CAP include cross-compliance standards, agri-

environment-climate measures (AECMs), organic farming support, ecological focus areas, and, most notably, the introduction of "green payments" under the 2013 reform. These instruments are designed not only to mitigate the environmental footprint of agriculture but also to encourage farmers to adopt practices that contribute to the protection of natural resources, climate resilience, and the preservation of rural landscapes.

The environmental dimension of the CAP has gained even greater significance in light of contemporary global challenges, such as climate change, biodiversity decline, and the degradation of ecosystem services. The European Green Deal and its associated strategies—including the Farm to Fork Strategy and the Biodiversity Strategy—underscore the EU's commitment to transitioning toward a more sustainable and resilient agricultural system. In this policy context, the CAP is expected to function as a key mechanism for achieving the EU's climate neutrality and sustainability goals.

Today, the CAP places significant emphasis on sustainability, not only through regulatory measures but also by allocating substantial financial resources to support environmentally sound agricultural practices. The integration of environmental and climate objectives into the CAP underscores the European Union's commitment to advancing sustainable agricultural development that is compatible with ecological preservation.

### **Subject and Objectives of the Research**

In response to escalating environmental concerns, the European Union (EU) has progressively integrated sustainability objectives into its Common Agricultural Policy (CAP). Within this framework, a variety of environmental measures and policy instruments have been developed with the goal of promoting sustainable development and protecting the environment for current and future generations. These instruments aim to preserve, safeguard, and enhance environmental quality, protect human health, and ensure the rational and sustainable use of natural resources. Furthermore, they address both regional and global environmental challenges, with particular emphasis on mitigating and adapting to climate change.

In recent years, climate change has emerged as a central environmental issue, due to its wide-ranging impacts on biodiversity, agricultural productivity, and the depletion of finite natural resources. Recognizing this, the CAP has undergone several reforms that have progressively strengthened its environmental dimension. These reforms have introduced modern environmental instruments that not only support the protection of ecosystems and natural capital, but also address emerging concerns such as the regulation of genetically modified organisms (GMOs) in agriculture and the need for climate action. Financial

allocations for environmental conservation under the CAP have also increased significantly, reflecting the growing importance of these issues.

The *aim of the study* is to conduct a comprehensive and critical analysis of the environmental measures and policy instruments introduced through the successive reforms of the Common Agricultural Policy (CAP) of the European Union, with the objective of evaluating their contribution to the promotion of sustainable agricultural practices and the protection of the environment.

This research seeks to systematically assess how these environmental provisions, ranging from cross-compliance and agro-environment-climate measures to green payments and eco-schemes have been conceptualized, implemented, and integrated into the broader agricultural policy framework at the EU level.

In this context, the subject of the study is the system of environmental measures and instruments embedded within the CAP of the European Union.

The object of the research is the analysis of the environmental performance of agriculture in EU Member States, with a particular focus on the effects of CAP reforms on sustainability outcomes. Additionally, the research includes the projection of key environmental indicators related to agricultural activity in the EU over future periods.

In accordance with the defined subject, object, and aim of the research, and in line with the outlined theoretical and empirical framework, the main research tasks of the study include:

1. **To conceptualize and critically examine the theoretical foundations of sustainable development and its relevance to the management of natural resources,**
2. **To explore the theoretical evolution and practical interpretations of sustainability in the agricultural sector,** including its principles, components, and applicability within the European Union's policy landscape
3. **To trace the historical development of the Common Agricultural Policy (CAP) of the European Union,** identifying key reform phases and assessing the integration and transformation of environmental measures across CAP reform cycles.
4. **To systematically categorize and analyse the environmental instruments introduced under the CAP**
5. **To investigate the role and development of organic agriculture in the EU** as an integral element of the Union's sustainable development strategy
6. **To evaluate the relationship between the economic and environmental performance of agriculture in the EU**

7. **To apply statistical and econometric tools to assess the correlation between agricultural economic indicators and environmental performance**
8. **To assess the use and effectiveness of agroecological indicators and measures within the CAP**, evaluating their application in Member States and their contribution to measuring and promoting sustainability in agricultural practices.
9. **To outline conclusions and formulate recommendations for enhancing the environmental dimension of the CAP**, contributing to the broader goal of aligning agricultural policy with the objectives of the European Green Deal, climate neutrality, and long-term ecological resilience.

Through a detailed assessment of the structure, implementation, and impacts of CAP environmental measures, this study aims to provide valuable insights for both researchers and policymakers. The findings will contribute to a deeper understanding of the interplay between agriculture and environmental sustainability and help identify best practices, policy gaps, and opportunities for enhancing the environmental performance of the CAP.

### **Research Methods**

This study applies a multi-method approach that integrates both qualitative and quantitative research methodologies in order to ensure a comprehensive analysis of the environmental measures within the Common Agricultural Policy (CAP) of the European Union.

The methods and sources are systematically organized according to the phases and objectives of the research:

(1) Literature Review. A comprehensive literature review was conducted to provide the theoretical foundation for the study;

(2) Method of Abstraction. The abstraction method was applied to identify the essential theoretical and conceptual elements from the broader body of literature and policy documentation;

(3) Historical, Descriptive, Compilation, and Comparison Methods. To trace the development of environmental measures within the CAP, the historical and descriptive methods were used to chronologically outline key policy reforms and institutional changes.

(4) Collection of Secondary Data- Empirical data were obtained from authoritative and publicly accessible databases, including Eurostat, the European Environmental Agency (EEA), the Organisation for Economic Co-operation and Development (OECD), the Farm Accountancy Data Network (FADN), and official reports from the European Commission (DG

AGRI). The data include environmental indicators, agricultural statistics, CAP funding allocations, and sustainability performance metrics;

(5) Statistical Methods. The collected data were processed using statistical inference methods. Descriptive were used to summarize environmental trends and outcomes;

(6) Multivariate Statistical Methods. To explore complex relationships between multiple variables, multivariate techniques were applied. Correlation and regression analyses were used to assess the strength and direction of associations between environmental outcomes and factors such as policy instruments, economic variables, and farm characteristics.

## **Chapter I: SUSTAINABLE MANAGEMENT OF NATURAL RESOURCES – THEORETICAL AND METHODOLOGICAL CONCEPTS**

Chapter I provides a comprehensive theoretical foundation for understanding the sustainable management of natural resources as an integral part of modern environmental and economic policy. It begins by clarifying the essence of sustainable development, observing the evolution of the concept from its early environmental origins to its contemporary multidimensional interpretation that integrates ecological balance, economic efficiency, and social equity. The chapter stresses that sustainability is not a fixed condition but a continuous process requiring equilibrium between human needs and the planet's ecological capacity.

Different interpretations of sustainability are presented, emphasizing that it functions both as a guiding principle and a practical framework for policy and decision-making. The chapter identifies the three core components of sustainable development, environmental protection, economic growth, and social well-being. It also outlines the principles of sustainable development, including equity, resource efficiency, precaution, and the integration of environmental concerns into economic planning.

A key focus is placed on global environmental challenges that threaten sustainability, such as climate change, deforestation, and air and water pollution. These issues are analyzed as manifestations of unsustainable production and consumption patterns, calling for coordinated international responses. The discussion of limiting global environmental issues highlights the need for systemic change in how societies manage and value natural resources.

The relationship between the environment and sustainable development is explored through the concept of ecological balance, ecosystem services, and the recognition that environmental degradation directly undermines economic and social progress. Within this framework, agriculture is presented as both a driver and a victim of environmental change. The section on sustainable development in agriculture emphasizes the transition toward climate-smart, resource-efficient, and biodiversity-friendly production systems. It argues that sustainable agriculture ensures food security, preserves soil and water quality, and supports rural livelihoods.

The chapter also examines the transformation of agribusiness under the influence of sustainability principles. It discusses the restructuring of production chains, the introduction of circular economy models, and the growing importance of corporate environmental

responsibility. The text suggests that agribusinesses must integrate sustainability into strategic planning to remain competitive and resilient.

Finally, the methodological framework of the study is outlined, combining theoretical and empirical approaches. The theoretical framework draws from environmental economics, systems theory, and sustainable development paradigms, while the empirical framework applies comparative analysis, statistical modelling, and case studies to assess real-world practices. The methods provide a structured basis for evaluating how sustainable management principles can be implemented in agriculture and related sectors.

### **1.1. Methodological framework of the study**

The methodological framework reflects and supports the dual structure of the study, which comprises both a theoretical and an empirical component. Each of these parts is introduced and guided by a tailored methodological rationale, ensuring consistency, transparency, and logical continuity throughout the research process.

Recognizing the interdisciplinary nature of the study, situated at the intersection of agricultural policy, environmental science, and sustainability, the methodology integrates a diverse range of qualitative and quantitative approaches. This multimethod design enables a holistic examination of the environmental dimensions of the Common Agricultural Policy (CAP) within the broader context of sustainable natural resource management in the European Union.

### **1.2. Theoretical framework of the study**

This research adopts a multidimensional theoretical approach to investigate the environmental components of the Common Agricultural Policy (CAP) of the European Union (EU), with particular emphasis on the policy's role in promoting sustainable natural resource management. The objective is to construct a solid conceptual and analytical framework through a critical synthesis of academic, policy, and institutional literature. A combination of qualitative research techniques is employed to analyze the evolution, design, and implementation of CAP environmental measures, alongside the normative paradigms and governance mechanisms that underpin them.

- ***Systematic Literature Review***

The foundational methodological pillar is a systematic literature review designed to capture the full breadth and depth of existing theoretical and empirical knowledge relevant to the research. This review applies structured search strategies across academic databases (e.g.,

Scopus, Web of Science, AGRIS, Google scholar, etc.) and institutional repositories (e.g., European Commission, OECD, FAO) to identify and select sources based on predefined inclusion criteria.

Materials reviewed include peer-reviewed journal articles, academic monographs, EU legislative texts, policy evaluations, white papers, technical reports, and proceedings from relevant scientific forums. The scope of the review encompasses literature on environmental governance, agri-environmental economics, sustainable agriculture, policy integration, and institutional change within the CAP. This is done in order:

- To map key theoretical debates and identify dominant conceptual frameworks (e.g., ecological modernization, multifunctionality, resilience thinking);
- To trace the intellectual lineage and interlinkages between competing schools of thought;
- To identify research gaps and theoretical blind spots that require empirical validation.

- ***Abstraction and Typological Analysis***

To manage the complexity of interdisciplinary literature, the method of abstraction is applied to isolate key theoretical constructs and operational categories. This process enables the definition of core analytical dimensions such as sustainability metrics, environmental performance indicators, and governance models.

Complementing this, typological analysis is employed to categorize the diverse policy instruments under the CAP, such as agri-environmental schemes, eco-schemes, and conditionality mechanisms, according to their design characteristics, regulatory intensity, and ecological objectives. This typology provides a structured basis for comparative analysis and facilitates theory-building around policy effectiveness.

- ***Historical-Institutional Analysis***

To understand the policy's temporal evolution and structural transformations, a historical-institutional approach is adopted. This method traces key reform phases of the CAP, examining how environmental objectives have been integrated over time.

Each reform phase is analyzed in terms of institutional drivers, stakeholder dynamics, and the normative frameworks informing environmental integration.

- ***Descriptive and Comparative Policy Analysis***

Descriptive analysis is applied to unpack the administrative logic and operational characteristics of CAP environmental instruments. This includes an examination of design features, eligibility criteria, monitoring systems, and funding modalities.

A comparative policy analysis framework is then employed to examine the diversity of implementation strategies across EU Member States. This involves assessing how national contexts, such as governance capacity, farm structure, and socio-economic variables influence the uptake and effectiveness of CAP environmental measures.

Comparative insights are drawn through structured comparison matrices and policy benchmarking techniques, allowing for the identification of best practices, policy innovation, and structural inefficiencies.

- ***Content and Discourse Analysis***

To complement the empirical interpretation of policy texts and strategic documents, qualitative content analysis is employed. This method allows for the systematic coding of policy objectives, thematic priorities, and implementation narratives embedded in official CAP-related texts. Additionally, discourse analysis is used to investigate the ideational underpinnings and narrative frames that shape environmental priorities within the CAP. This includes an examination of how concepts such as “public goods,” “climate-smart agriculture,” and “ecosystem services” are constructed, contested, and institutionalized within EU policy discourse.

- ***Synthesis and Theoretical Integration***

All methodological components converge in a final synthesis phase, where insights from the various analytical layers are integrated into a coherent theoretical framework. This integration is guided by meta-theoretical principles from political ecology, institutional economics, and governance theory.

The resulting framework provides both a critical lens for interpreting CAP environmental instruments and a basis for empirical exploration in subsequent phases of the research.

### **1.3. Empirical Framework of the study**

The empirical component of this dissertation is structured to assess the effectiveness of environmental measures embedded within the Common Agricultural Policy of the European Union. This analysis centers on the evaluation of environmental performance indicators across EU Member States and the projection of future trajectories under alternative policy scenarios.

- ***Quantitative Research Framework***

The study adopts a positivist research paradigm, grounded in quantitative analysis, to systematically test and evaluate the environmental impacts of CAP instruments. The methodological framework is designed to:

- Measure spatial and temporal variations in key environmental indicators;
- Identify statistical associations and potential causal relationships between policy inputs and ecological outcomes;
- Evaluate the policy effectiveness of CAP instruments in different national and agro-ecological contexts.

- ***Descriptive Statistical Analysis***

Descriptive statistics are applied to summarize and visualize the distributional properties of selected environmental performance indicators across EU Member States and over defined time periods. Key indicators include:

- Greenhouse gas (GHG) emissions from agriculture (CO<sub>2</sub>-equivalent);
- Share of organic farming in total agricultural land;
- Pesticide and nitrogen fertilizer use;
- Soil erosion risk estimates;
- Biodiversity indices, including farmland bird populations and habitat diversity (Eurostat, 2023; OECD, 2020).

- ***Multivariate Statistical Techniques***

To deepen the analysis beyond descriptive trends, advanced multivariate techniques are employed to examine the structural relationships between environmental outcomes and potential explanatory variables.

- ***Correlation Analysis***

Pearson and Spearman correlation coefficients are calculated to assess the strength and direction of associations between pairs of variables. These include relationships between environmental indicators and socioeconomic or policy variables such as CAP subsidy intensity, eco-scheme participation rates, and average farm size.

- ***Regression Modeling***

The study employs a series of linear and multiple regression models to isolate and quantify the effects of CAP environmental measures on observed ecological outcomes. Key explanatory variables include:

- CAP payments per hectare (total and environmentally targeted);
- Eco-scheme uptake rates;
- Average farm size and specialization;
- Geographical location and biophysical characteristics;
- Agricultural income levels and rural population density.

Robust standard errors are used to address potential heteroscedasticity, and multicollinearity is tested via variance inflation factors (VIF). Where appropriate, panel data techniques (fixed effects or random effects models) are employed to control for unobserved heterogeneity across Member States and over time.

- ***Data Sources and Validation***

The empirical analysis draws from a triangulated dataset derived from the following authoritative sources:

- EUROSTAT – environmental and agricultural statistics;
- FAOSTAT – global datasets on inputs and land use;
- OECD Agri-Environmental Indicators;
- European Environment Agency (EEA) – state of the environment reports;
- European Commission DG AGRI – CAP monitoring and evaluation reports;
- Farm Accountancy Data Network (FADN) – micro-level farm economic data.

All datasets are subjected to consistency checks and validation protocols, including missing data imputation, harmonization of units, and cross-source triangulation.

***Integration and Interpretation***

The synthesis of statistical results is contextualized within the broader policy discourse, enabling the integration of quantitative findings with normative and institutional considerations. The empirical findings inform a critical reflection on the performance of CAP environmental instruments, highlighting success factors, systemic limitations, and pathways for policy reform.

This empirical strategy ensures a rigorous and policy-relevant evaluation of the CAP's environmental effectiveness. By combining descriptive analytics with advanced econometric modeling and future scenario projections, the research bridges the gap between quantitative evidence and policy design, contributing to a deeper understanding of how agricultural policy can support sustainability goals in a complex and heterogeneous European context.

## **Chapter II: HISTORIC EVOLUTION OF THE COMMON AGRICULTURAL POLICY OF THE EUROPEAN UNION – MAJOR REFORMS**

The Common Agricultural Policy of the European Union represents one of the most comprehensive and enduring frameworks of supranational governance in the world. Since its creation in 1962, it has served as a cornerstone of European integration, economic solidarity, and food security. Originally designed to ensure stable agricultural production and fair living standards for farmers in post-war Europe, the CAP has undergone profound transformations over the decades. From its early focus on productivity and market stabilization, the policy has progressively integrated social, environmental, and sustainability objectives, evolving into a complex system that now intertwines food production with climate action and rural development.

### **2.1. Foundations and Early Development**

The CAP was established under the Treaty of Rome (1957) and became operational in 1962, embodying three fundamental principles: the creation of a single market, community preference, and financial solidarity. These principles ensured the free movement of agricultural goods within the European Economic Community (EEC), protection of internal markets from cheap imports, and shared financial responsibility among Member States. In the 1960s, Europe was still recovering from wartime devastation, facing acute food shortages and fragile rural economies. The policy thus prioritized food self-sufficiency and market stability over environmental or social considerations.

In this initial period, agricultural modernization was aggressively pursued through subsidies and price supports. The newly created European Agricultural Guidance and Guarantee Fund (EAGGF) provided mechanisms for market intervention and structural modernization. The policy's immediate success was undeniable: food production soared, prices stabilized, and farmers' incomes improved. However, the same mechanisms that ensured stability also led to inefficiencies and distortions. Overproduction, famously symbolized by "butter mountains" and "wine lakes", became a persistent issue, alongside ballooning budgetary costs and environmental degradation from intensive farming practices.

## **2.2. Expansion and Structural Challenges**

The enlargement of the EEC in the 1970s and 1980s, which brought in the United Kingdom, Ireland, Denmark, and later Southern European countries, placed new pressures on the CAP. Diverging agricultural structures, price policies, and levels of development necessitated complex adjustments. By the late 1970s, overproduction had become endemic, and the financial burden of market support mechanisms was unsustainable. The crisis led to debates over reforming the CAP to make it more market-oriented, equitable, and environmentally responsible.

Agricultural intensification during these decades profoundly impacted the environment. Excessive use of fertilizers and pesticides, soil degradation, water pollution, and loss of biodiversity became visible consequences of policy-driven overproduction. Yet, the concept of “sustainability” was not yet part of the agricultural policy vocabulary. The main reforms of the 1980s, particularly the Delors Package (1984–1988), began to raise awareness of environmental issues but did not yet institutionalize specific measures. The first tentative steps toward integrating environmental concerns came through afforestation programs and proposals for habitat protection, but these remained largely theoretical.

## **2.3. The 1992 MacSharry Reform: The First Step Toward Sustainability**

The early 1990s marked a turning point in European agricultural policy. Under the MacSharry Reform (1992), the CAP experienced its first major restructuring. This reform recognized that continuous price supports were economically inefficient and environmentally harmful. It reduced guaranteed prices for key commodities and introduced direct income support to farmers. More importantly, it introduced the first **agro-environmental measures**, incentivizing farmers to adopt environmentally friendly practices.

The reform aimed to align agricultural production with environmental protection and rural development. Measures such as early retirement schemes for farmers, afforestation of agricultural land, and compensation for less-favored areas were introduced. This marked the birth of the CAP’s “second pillar,” focused on rural development, complementing the traditional market and price measures of the “first pillar.” Although environmental outcomes were limited at this stage, the reform laid the groundwork for future integration of sustainability into agricultural policy.

## **2.4. Agenda 2000: Strengthening the Dual-Pillar Structure**

By the end of the 1990s, the European Union faced new challenges, particularly the planned enlargement to include Central and Eastern European countries. Their less developed agricultural sectors required new support mechanisms. The Agenda 2000 reform (1999) reinforced the dual-pillar structure of the CAP: the first pillar for market and income support, and the second for rural development. Environmental protection became an explicit policy objective, though budget allocations for such measures remained modest.

Agenda 2000 sought to enhance the competitiveness of European agriculture, ensure food safety, and integrate environmental considerations more systematically. It introduced cross-compliance mechanisms, linking farmers' eligibility for subsidies to adherence to environmental standards. Moreover, the reform encouraged diversification of rural economies, promoting agritourism, organic farming, and landscape conservation. Still, despite these advancements, the environmental dimension of CAP was secondary to economic stabilization and preparation for EU enlargement.

## **2.5. The 2003 Fischler Reform: Environmental Policy Mainstreaming**

A significant leap in environmental integration came with the Fischler Reform of 2003, often regarded as a landmark in the evolution of the CAP. It introduced the Single Payment Scheme (SPS), which “decoupled” subsidies from production levels. This shift meant that farmers could receive financial support without being incentivized to produce more, thus reducing market distortions and overproduction. Crucially, the reform strengthened “cross-compliance,” making farmers' payments conditional on compliance with environmental, animal welfare, and food safety standards.

The Fischler Reform also increased funding for the second pillar, directing substantial resources toward agri-environmental measures, biodiversity protection, and climate mitigation. It promoted afforestation of non-agricultural land, establishment of agroforestry systems, and conservation of Natura 2000 areas. For the first time, CAP explicitly recognized the multifunctional role of agriculture—producers not only of food but also of environmental and social goods. The reform effectively repositioned agriculture within the broader paradigm of sustainable development.

## **2.6. The 2008 Health Check: Adapting to New Environmental Challenges**

The Health Check reform of 2008 built upon Fischler's legacy but did not introduce radical changes. Instead, it modernized and simplified existing mechanisms to better respond

to new challenges such as climate change, water scarcity, and biodiversity loss. Modulation of funds from the first to the second pillar increased financial support for environmental measures. Rural development policies were expanded to include renewable energy, water management, and greenhouse gas reduction initiatives.

The Health Check reform recognized the interconnection between agricultural production and environmental degradation, placing emphasis on “greener” farming practices. Farmers were encouraged to use energy more efficiently, reduce emissions, and adopt innovative water-saving technologies. Although these efforts improved environmental outcomes, they remained constrained by the complexity of CAP’s financial structure and uneven implementation across Member States.

### **2.7. The 2013 Reform: Greening the CAP**

The 2013 reform (for the 2014–2020 period) represented another milestone, aligning CAP more explicitly with the Europe 2020 Strategy for smart, sustainable, and inclusive growth. It introduced the concept of “greening” as a central pillar of agricultural policy. Thirty percent of direct payments to farmers became conditional on compliance with environmentally beneficial practices such as crop diversification, maintenance of permanent grasslands, and creation of ecological focus areas. The reform emphasized balanced rural development, resource efficiency, and climate resilience.

Greening linked agricultural subsidies to environmental outcomes, encouraging farmers to adopt practices beneficial to biodiversity and soil health. The European Agricultural Fund for Rural Development (EAFRD) was restructured to support projects related to renewable energy, organic farming, and climate adaptation. Despite progress, evaluations of the 2014–2020 CAP revealed that while emissions from agriculture decreased, targets related to biodiversity and soil quality were not fully achieved. Nevertheless, the reform represented a critical step in mainstreaming environmental sustainability into agricultural governance.

### **2.8. The 2023–2027 CAP: A New Era of Green Ambition**

The new CAP for 2023–2027 reflects the EU’s commitment to the European Green Deal and its “Farm to Fork” and “Biodiversity” strategies. This reform marks a decisive shift toward performance-based governance, subsidiarity, and ecological transition. Member States now design their own National Strategic Plans, tailoring interventions to national priorities while contributing to common EU objectives. The new policy rests on three overarching goals-a

greener, fairer, and more competitive CAP, and nine specific objectives emphasizing climate action, biodiversity protection, rural vitality, and fair income distribution.

A central innovation is the introduction of eco-schemes, which account for 25% of direct payments and reward farmers for voluntary environmental and climate actions such as organic farming, agroecology, precision agriculture, and improved animal welfare. These measures complement the strengthened “conditionality” requirements that integrate directives on pesticide use and water management. The new CAP also introduces crisis reserves, redistributive payments to support smaller farms, and reinforced measures for young farmers and smart rural innovation. At least 35% of funds from the second pillar are allocated to environmental and climate-related actions, ensuring tangible progress toward sustainability.

## **2.9. Environmental Measures in Historical Perspective**

The trajectory of environmental integration within the CAP reflects the gradual recognition of agriculture’s dual role, as both a driver of and a potential solution to environmental degradation. In the 1960s and 1970s, environmental issues were largely absent from policy discourse. The first genuine ecological considerations appeared in the late 1980s and early 1990s, with the introduction of agro-environmental programs under the MacSharry reform. From then onward, environmental objectives became increasingly sophisticated, evolving from compensatory measures to proactive strategies for sustainability.

The Fischler and Health Check reforms institutionalized environmental management, establishing cross-compliance and modulation as central policy tools. The 2013 reform transformed environmental protection into a condition for receiving public funds, while the 2023 reform embeds it within a comprehensive climate and biodiversity framework. Over time, CAP’s environmental measures evolved from isolated initiatives into an integrated system of climate-smart, resource-efficient policies aligned with the Sustainable Development Goals (SDGs) and the Paris Agreement.

The evolution of the Common Agricultural Policy illustrates the EU’s broader shift from economic protectionism to sustainable governance. The CAP today is not merely an agricultural policy but a multidimensional framework that connects food production, environmental stewardship, and social equity. It has gradually embraced the principle that public funds should reward public goods—clean air, fertile soil, healthy ecosystems, and vibrant rural communities.

Yet, challenges remain. Despite substantial reforms, the effectiveness of environmental measures varies across Member States, reflecting differences in implementation capacity and political will. The balance between competitiveness and sustainability continues to be delicate,

and debates persist regarding fairness in fund distribution, especially between large and small farms. Nonetheless, the CAP's trajectory demonstrates a clear trend toward ecological modernization and social responsibility.

In conclusion, the Common Agricultural Policy has transformed from a mechanism of post-war recovery into a strategic instrument of sustainable development. Its ongoing reforms reveal a steady expansion of objectives—from market stabilization to environmental conservation and climate action. As the EU moves deeper into the green transition, the CAP stands as both a reflection of and a tool for the continent's commitment to reconciling economic vitality with ecological integrity. The policy's future success will depend on maintaining this delicate balance, ensuring that Europe's farms not only feed its people but also safeguard the planet for generations to come.

### **Chapter III: ANALYSES OF THE RELATIONSHIP BETWEEN ECONOMIC AND ENVIRONMENTAL PERFORMANCE OF AGRICULTURE**

Chapter III presents the analytical and empirical core of the dissertation, exploring the complex interrelation between the economic efficiency of agriculture and its environmental performance across the European Union. The chapter emphasizes that modern agricultural development cannot be evaluated solely through productivity or profitability; rather, it must be assessed through its environmental impact, sustainability of resource use, and contribution to climate goals. The discussion integrates both quantitative and qualitative analyses, supported by statistical data, comparative evaluation, and correlation methods.

#### **3.1. Empirical comparison of the links between economic performance of agriculture and environmental conditions among European countries**

The share of agriculture in GDP for European Union countries, according to the obtained values, can be interpreted in two ways depending on the perspective. From an economic aspect, the value of this variable should be higher as it indicates a significant economic contribution of agriculture, i.e., that agriculture achieves significant economic performances. Countries with a high value of the share of agriculture in GDP are those where agriculture has a large share in GDP, where rural population is fairly represented, and where a large percentage of the workforce is engaged in agriculture. From an environmental aspect, the value of the share of agriculture in GDP should be low. Lower values of the share of agriculture

in GDP indicate a small representation of agriculture, and consequently, a lower percentage of employment in it, as well as rural population in the total population.

According to the values of the share of agriculture in GDP, Latvia stands out with the highest value (around 5%) during both 2020 and 2022. During both analyzed years, Latvia is followed by Romania, Bulgaria, Hungary, and Greece.

On the other hand, Luxembourg has the lowest share in GDP for the countries in the European Union in both analyzed years, which amounts to around 0.5. According to the values of the share of the agricultural sector in GDP for the countries in the European Union, Belgium has very low economic performances in agriculture due to its orientation towards other economic sectors that are drivers of a higher degree of economic development. Agricultural activities are more significant in Malta, Belgium, and Denmark, which have lower values for each of the individual indicators included in the index structure.

**Table 1. Descriptive Statistics for the Share of Agriculture in GDP for European Union countries for the years 2020 and 2022.**

Year	N	Minimum	Maximum	Mean	Std. Deviation
2020	27	.21 (Luxemburg)	4.34 (Latvia)	2.1622	1.15351
2022	27	.25 (Luxemburg)	5.12 (Latvia)	2.1911	1.24126

Source: Own calculations

According to the report on environmental performances for 2020 and 2022, 180 countries worldwide were analyzed. For all countries in the European Union that are the subject of interest in this dissertation, it is characteristic that they are ranked high in both analyzed years, i.e., they are in the top third of the ranking list.

**Table 2. Descriptive statistics of the Environmental Performance Index of the countries in the European Union for the years 2020 and 2022.**

Year	N	Minimum	Maximum	Mean	Std. Deviation
2020	27	57.00 (Bulgaria)	82.50 (Denmark)	70.6667	7.11510
2022	27	50.40 (Portugal)	77.90 (Denmark)	61.5741	7.68403

Source: Own calculations

The high positions on the ranking list of countries according to environmental performances indicate that all countries in the European Union are significantly concerned about the state of the environment. The values of the EPI index for the selected group of countries for analysis range from 67 to 82 in 2020, while there are several lower values (from 50 to 77) in 2022.

In the 2020 report, the country that was ranked first in the world was Denmark with a high EPI index of 77.90 . Denmark ranks second in the list for 2022, followed by Finland, Malta, and Sweden, with slightly lower percentages of achieving the required level of environmental performance. At the same time, the mentioned countries in the European Union are among the top 10 countries in the world in 2022 according to balanced management of two fundamental dimensions of sustainable development: environmental health and ecosystem vitality.

The report on the environmental performance of the countries of the world for 2022 highlights Finland in second place in the global ranking with a score of 76.50. Finland's high position in the 2022 ranking is explained by its strong concern for biodiversity and habitats, especially in the context of marine protected areas. Also in the field of climate and energy, Finland excels in sustainable nitrogen management.

In general, the countries Denmark, Finland, Malta and Sweden, which follow in the ranking list for 2022, achieved the best performance in protecting public health, preserving natural resources and separating greenhouse gas emissions from economic activities (Wendling et al ., 2018).

Portugal has the lowest value of the EPI index for 2022 among the countries in the European Union (50.40) and occupies the 48th place in the world ranking list. In Portugal, the negative influence of heavy metals, for example, the content of lead in fruits, cereals and meat products, which causes exposure to lead in the diet of the population, is highlighted. Low values for environmental performance in Portugal are also observed in the areas of air quality, fishing, climate and energy, especially in terms of the emission intensity of black coal. The average value of this index for the countries in the European Union in 2022 is 61.57 and can be considered a high value so far when viewed globally.

In order to analyse the high degree of interdependence between environmental performance and economic performance of agriculture between countries in the European Union, the technique of multivariate analysis - correlation analysis was applied. The selected analysis examines the degree of quantitative coincidence of the values of the share of agriculture in the GDP and the Environmental Performance Index for the countries in the European Union

for the period from 2020 to 2022. In this case, Pearson's linear correlation coefficient was used as a measure of the relationship between the selected variables. This correlation coefficient provides a measure of the association between two variables, while not determining the causal relationship between them.

Before calculation of the correlation coefficient, a preliminary analysis was performed to test the assumptions of linearity and homogeneity of variance, based on the distribution diagrams. The distribution diagram showed that the results had a linear distribution and it was confirmed that the conditions for applying the correlation analysis were met.

**Table 3. Value of Pearson's correlation coefficients between the Share of agriculture in GDP of the EU countries and the Environmental Performance Index for 2020**

		EPI	AGRARGDP
EPI	Pearson Correlation	1	-.691**
	Sig. (2-tailed)		.000
	N	27	27
AGRARGDP	Pearson Correlation	-.691**	1
	Sig. (2-tailed)	.000	
	N	27	27

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Source: Own calculations

**Table 4. Value of Spearman's correlation coefficients between the Share of the agrarian in the GDP of the EU countries and the Environmental Performance Index for 2020.**

			EPI	AGRARGDP
Spearman's rho	EPI	Correlation Coefficient	1.000	-.713**
		Sig. (2-tailed)	.	.000
		N	27	27
	AGRARGDP	Correlation Coefficient	-.713**	1.000
		Sig. (2-tailed)	.000	.
		N	27	27

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Source: Own calculations

The obtained value of the Pearson coefficient (-0.691) for 2020 shows that there is a weak correlation between the share of agriculture in GDP for the countries of the European Union and the Environmental Performance Index. The direction of the quantitative matching is

indirect, which indicates that higher values of the share of agriculture in GDP for the countries of the European Union are associated with lower values of the Environmental Performance Index. The obtained correlation coefficient for 2020 is statistically significant and equals 0.00, which indicates the confidentiality of the obtained result. The value of Spearman's correlation coefficient is approximately the same as that of Pearson's coefficient, where that value is ranked.

For 2020, the value of the Pearson correlation coefficient is -0.48, which reveals the existence of a high degree of quantitative agreement between the Share of agriculture in GDP for the countries of the European Union and the Environmental Performance Index. Given that the value of the coefficient is negative, there is an indirect correlation between the variables. The completed level of significance (0.011) indicates that the correlation is statistically significant.

**Table 5. Value of Pearson's correlation coefficients between the Share of the agrarian in the GDP of the EU countries and the Environmental Performance Index for 2022.**

		EPI	AGRARGDP
EPI	Pearson Correlation	1	-.480*
	Sig. (2-tailed)		.011
	N	27	27
AGRARGDP	Pearson Correlation	-.480*	1
	Sig. (2-tailed)	.011	
	N	27	27

\*. Correlation is significant at the 0.05 level (2-tailed).  
 Source: Own calculations

The value of the Spearman correlation coefficient for the correlation between selected variables for the year 2022 is smaller compared to 2020 and amounts to -0.534. The negative correlation relationship between the share of agriculture in GDP of the countries in the European Union and the Environmental Performance Index during both years is expected. Achieving greater economic success in agriculture entails lower environmental performances. This relationship arises from the fact that countries with developed agricultural production significantly impact the environment through achieving greater economic success in agriculture. To achieve higher yields, which are a prerequisite for improved economic performance in agriculture, large quantities of pollutants are often used, affecting the environment and reducing the level of environmental performance. This confirms the assertion

that there is a high quantitative agreement with reverse direction between the economic performances in agriculture and the environmental performances.

**Table 6. Value of Spearman's correlation coefficients between the share of agriculture in the GDP of the EU countries and the Environmental Performance Index for 2022.**

			EPI	AGRARGDP
Spearman's rho	EPI	Correlation Coefficient	1.000	-.535**
		Sig. (2-tailed)	.	.004
		N	27	27
	AGRARGDP	Correlation Coefficient	-.535**	1.000
		Sig. (2-tailed)	.004	.
		N	27	27

\*\* . Correlation is significant at the 0.01 level (2-tailed).

Source: Own calculations

The indirect agreement indicates the well-known fact that increased activities in agriculture, and thus achieving better business results, lead to a greater share of agriculture in GDP. This relationship ultimately leads to inconsistency with environmental principles, resulting in environmental degradation. The countries in the European Union that have a greater share of agriculture in GDP, in any case, achieve lower environmental performances, and vice versa.

Overall, according to all conducted analyses related to the investigation of the mutual dependence between economic and environmental performances in agriculture, it has been shown that there is indirect and quantitative agreement with pronounced intensity. According to these obtained results, a high degree of mutual dependence between economic and environmental performances in agriculture in the countries of the European Union, is confirmed.

### **3.2. Analyses of the Application of Agro ecological Indicators in the Common Agricultural Policy of the European Union**

To address the application of agro ecological indicators in the Common Agricultural Policy of the EU, secondary data analysis was employed. Literature sources were selected based on searches in the Google Scholar database using keywords such as agro ecological indicators, evaluation, measures, Common Agricultural Policy. The selected studies were present in databases such as Web of Science, Scopus, or CAB Abstracts, as well as scientific reports from

international conferences. Additionally, official publications from the European Commission (EC), the Organization for Economic Co-operation and Development (OECD), the Food and Agriculture Organization (FAO), and the European Environment Agency (EEA) were utilized. Eurostat, the statistical office of the European Union, was used to present and compare selected agroecological indicators across different EU member states.

### **Agro ecological indicators**

Agro ecological indicators provide an overview of the state of the environment in which agriculture takes place, track the impact of agriculture on the environment, serve to assess the impact of agricultural and environmental policies on sustainable economic management, provide a basis for making policy decisions, and illustrate the relationship between agriculture and the environment to the wider public (Wieck and Hausmann, 2019). In order to link agroecological indicators with policy implementation, certain monitoring methods were previously introduced within the CAP framework. Thus, for the period from 2007 to 2013, a new integrated Common Monitoring and Evaluation Framework (CMEF) was introduced, which included indicators for evaluating rural development programs in member states. Furthermore, its improvement and supplementation led to the Common Monitoring and Evaluation Framework of the CAP (pillar 1 and pillar 2) for the period from 2014 to 2020. It was developed based on the three main objectives of the CAP (EC, 2015):

1. Sustainable food production, which includes ensuring food safety and promoting the competitiveness of agriculture in the EU, by providing ways to counter potential obstacles in the agri-food sector and the functioning of the food chain,
2. Sustainable management of natural resources and response to climate change, as well as maintaining natural resources essential for agricultural production, and
3. Balanced rural development, including socio-economic development of rural areas while preserving structural diversity across the EU.

The indicators covered by CMEF include output indicators (e.g., how much investment is financed through a measure), direct and indirect impact indicators (e.g., number of jobs created per investment), and impact indicators illustrating long-term effects (e.g., reduction in unemployment rate). Moreover, output indicators are linked to individual policy interventions, result indicators with specific objectives, and impact indicators with general CAP objectives.

In addition to socio-economic and sectoral indicators, CMEF defines the indicators of the second pillar through the Common Monitoring and Evaluation System - CMES. The environmental state indicators include: land cover, areas with natural constraints, intensity of

agriculture, Natura 2000 ecological network areas, population index of common bird species in agricultural habitats, conservation status of agricultural habitats (grasslands), agricultural production in areas of high natural value, protected forests, water use in agriculture, water quality, organic matter in organic layer, soil erosion by water, production of renewable energy from agriculture and forestry, energy consumption in agriculture, forestry and food industry, and greenhouse gas emissions from agriculture. For each indicator, a detailed explanation is provided, including the unit of measurement, data sources, spatial framework, frequency, etc. (EC, 2017).

The evaluation of agricultural policy measures represents an opportunity to assess whether the implemented intervention is appropriate, thereby helping to make better policy decisions in the future. Although the process of adapting CMEF is still ongoing, awareness of the need and obligation to measure the effects of public expenditure has increased. Data sources for preparing evaluation reports for the indicators are numerous, such as: Eurostat, Farm Accountancy Data Network - FADN, European Environment Agency, Directorate-General for Environment, United Nations Economic Commission for Europe - UNECE, Food and Agriculture Organization, Organization for Economic Co-operation and Development - OECD, Joint Research Centre - JRC, NATURA, various national studies, research, reports, and other specific databases that monitor forests, habitats, species, etc. (EC, 2017).

With regard to official EU statistics, Eurostat, it is noted that the level of development and currency of agro-ecological indicators varies. Some are already in use, their definitions and measurements are well explained, and the data are available at the national level and, if necessary, at the regional level. Other indicators are well defined but lack regional or consistent data, or their measurement models are incomplete. Considering that some indicators require significant improvements for full inclusion or reuse, they are not yet included in the Eurostat database or are archived only for some past periods. Here, we present a brief chronology of the development of agro-ecological statistical indicators. An agreement between the European Commission (EC) and the European Environment Agency (EEA) in 2000 initiated intensive work on the development of indicators for assessing the impact of agriculture on the environment for the 15 EU member states. As a result, in 2001, the EC issued a communication entitled "Statistical information needed for indicators to monitor the integration of environmental concerns into the CAP" (COM (2001)), proposing 35 agro-ecological indicators. The indicators were categorized into four main heads. These are "Responses," "Driving Forces," "Pressures and State/Impact." The "Responses" head includes public policies, technologies, markets, and producer behavior. Then, the "Driving Forces" head includes four elements: input

use, land use, farm management, and trends. The "Pressures and State/Impact" head contains sub-headings for pollution, resource use, and benefits. Lastly, the "State/Impact" head contains sub-headings for biodiversity and habitats, natural resources, and landscape. All elements within the heads contain measurable indicators (in measurement units) displayed in the Eurostat database.

The initial set of 37 indicators was developed by the European Environment Agency (EAA) in 2004. The aim of this database was to improve the quality, flow, and geographical coverage of data, contribute to other initiatives for developing indicators, and provide a functional and stable basis for evaluating progress according to the priorities of environmental policy. The indicators cover topics such as air pollution and ozone layer reduction, climate change, waste, water, biodiversity, and soil properties, as well as the four sectors: agriculture, energy, transport, and fisheries.

According to the authors (Kim et al., 2013), the OECD, in collaboration with Eurostat and FAO, developed a wide range of agro-ecological indicators presented in the report "The OECD Compendium of Agro-environmental indicators" for 35 OECD member countries. They are intended to serve as information for decision-makers and the general public about the current state and changes in conditions around agriculture, as well as to better understand the relationships between the causes and impacts of agriculture, agricultural policy reforms, trade lobbying, and environmental measures. They also serve as aids in making appropriate responses to changes in environmental protection conditions and contribute to effectively monitoring and evaluating the effectiveness of policies dealing with agriculture and the environment issues, supporting sustainable agriculture, including future perspectives on the relationships between agriculture and the environment. The OECD's agro ecological indicators cover four important areas:

1. The impact of economic, environmental, and social factors on the relationship between agriculture and the environment,
2. The relationship between different agricultural practices and their impact on the environment, especially farm management practices (e.g., organic farming, nutrient management, pests, land and irrigation management),
3. Monitoring trends in the use of agricultural inputs (e.g., mineral fertilizers, livestock manure), pesticides (including risks), water, and others,
4. Monitoring the impact measures of agriculture on soil quality, water, soil conservation, greenhouse gases, biodiversity, wildlife habitats, and landscape.

The success of implementing agro ecological indicator measures in the future (2021–2027) will be demonstrated through the so-called output indicators, i.e., indicators of the direct link between costs and results (e.g., how many hectares of agricultural or forest land are covered by agroecological measures or how many users are involved). This will also contribute to improving supervision over a short period, while long-term goals (e.g., improving biodiversity) are still not visible (Meredith and Hart, 2019).

Several agro-ecological indicators available for all EU member states have been selected in order to assess which member states exert the greatest pressure on the environment through their agricultural production. The selection of indicators was made according to two criteria: the last available year, that is, the last official data, and the property of relativity (they show a relationship between observed phenomena). It is important to note that the last available year differs for different indicators, but it is the latest official data on the Eurostat database and as such serves as a basis for making policy decisions. For clarity, the names of the indicators are marked with numbers:

- (1) Utilized agricultural area (UAA) under NATURA 2000 in 2016 (%);
- (2) Increase/decrease of the area with organic farming in 2017 according to 2012 (%);
- (3) Share of energy used in agriculture in 2017 (%);
- (4) Conditional heads per hectare in 2016;
- (5) Nitrogen balance (kg N per ha IZP) in 2015;
- (6) Phosphorus balance (kg P per ha IZP), three-year average 2013-2015;
- (7) Gas emissions per EPA (kilotons of CH<sub>4</sub> and N<sub>2</sub>O per 1000 ha).

The proportion of agricultural land under the Natura 2000 network is highest in Croatia (25.7%), Bulgaria (25.7%), Slovenia (23.2%), while it is lowest in Finland (1.2%) and the United Kingdom (2.5%). Between 2012 and 2017, the largest increase in agricultural land was observed in Bulgaria and Croatia (over 200%). However, four EU member states experienced a decrease in the area under ecological farming: Romania (-10.3%), Greece (-11.3%), the United Kingdom (-15.6%), and Poland (-24.5%).

Energy consumption within agricultural production accounted for 2.8% of the total energy consumption in the EU-28 in 2017. The highest energy consumption in agriculture was recorded in the Netherlands (8.2%) and Poland (5.6%). The Netherlands also leads in the pressure of livestock production on the environment with 3.8 livestock units per hectare in 2016, followed by Malta and Belgium with 2.9 and 2.8 livestock units per hectare, respectively. Bulgaria, Slovakia, and the three Baltic countries showed the lowest density of livestock units per hectare, ranging from 0.2 to 0.3.

**Table 7.** Selected agro-ecological indicators for EU-28 member states

Member State	Indicator (1)	Indicator (2)	Indicator (3)	Indicator (4)	Indicator (5)	Indicator (6)	Indicator (7)
Belgium	7.2	39.8	2.4	2.8	132	5.4	7.4
Bulgaria	22.4	249.1	1.8	0.2	28	-6.9	1.2
Czech Republic	6.6	5.9	2.6	0.5	98	-2.6	2.3
Denmark	4.7	16.2	4.3	1.6	80	7.4	3.8
Germany	10.6	18.6	:	1.1	82	-2.2	3.8
Estonia	5.7	38.3	4.7	0.3	22	-7.2	1.3
Ireland	3.7	40.8	2.0	1.3	42	4.5	4.2
Greece	18.7	-11.3	1.8	0.5	59	1.0	1.6
Spain	16.8	18.5	3.0	0.6	39	3.6	1.5
France	8.3	69.2	2.7	0.8	42	1.1	2.6
Croatia	25.7	202.8	3.0	0.5	65	4.4	1.6
Italy	10.8	63.5	2.4	0.8	66	-1.2	2.3
Cyprus	6.1	43.2	2.9	1.5	194	31.2	4.4
Latvia	6.6	37.4	4.8	0.3	28	2.2	1.4
Lithuania	4.6	49.6	2.1	0.3	25	1.6	1.5
Luxembourg	21.1	31.8	0.7	1.3	129	4.1	5.1
Hungary	14.7	52.9	3.4	0.5	39	-1.3	1.2
Malta	7.9	10.8	1.0	9.0	147	29.1	5.6
Netherlands	4.3	17.0	8.2	3.8	189	3.0	10.4
Austria	11.5	16.4	2.0	0.9	41	2.3	2.6
Poland	11.5	-24.5	5.6	0.7	48	1.9	2.0
Portugal	18.1	26.4	2.4	0.6	41	4.7	1.8
Romania	12.7	-10.3	2.2	0.4	9	-1.4	1.3
Slovenia	23.2	31.7	1.5	1.0	45	2.9	3.6
Slovakia	16.0	15.1	1.4	0.3	38	-5.8	1.5
Finland	1.2	30.8	2.9	0.5	49	3.9	2.8
Sweden	4.1	20.8	1.0	0.6	32	0.3	2.2

**Source:** Eurostat, Agro-environmental indicators

According to authors who deeply analyze the issue of member states as polluters of the environment due to agricultural production (Van Grinsven et al., 2019), the member states exerting the greatest pressure on the environment due to their agricultural production are the Netherlands, Belgium, Germany, France, and Italy, while the lowest pressure on the environment is exerted by Lithuania, Latvia, and Slovakia. A decrease in pressure in the future also means a decrease in agricultural production, especially in livestock farming, which could lead to an increase in production in other countries, usually central or eastern EU members or globally, to meet demand. Therefore, pressure must be fully reduced with new, timely agricultural policy measures, creating agricultural-food systems with minimal resource

consumption and gas emissions, changes in dietary habits, better management of food waste, and others.

The conclusions from this from these analyses are as follows:

- The complex relationship between agriculture and the environment can be both positive and negative. For example, agriculture positively affects landscape appearance, prevents natural disasters, but also causes soil erosion, deforestation, harmful gas emissions, and loss of biodiversity.
- The European Union, through its Common Agricultural Policy, aims to be a leader in implementing agro-ecological measures as agriculture is a significant polluter of the environment.
- Agro-ecological indicators, used to assess the effects of measures, are numerous and are created through various collaborations of Eurostat and several important European and global institutions: OECD, EEA, JRC, NATURA, etc.
- The analysis of the selected agro-ecological indicators for all EU member states through Eurostat showed that economically efficient members in the agriculture and food sector simultaneously exert the greatest pressure on the environment.
- The future Common Agricultural Policy (2021-2027) focuses on strict monitoring of the link between costs and outputs and greater rewards for the implementation of good agro-ecological practices at the state and farm levels.
- Within existing good agricultural and environmental practices (GAEC), three new conditions are added, and current greening payments and multiple appropriateness are removed. So-called "eco-schemes" are introduced, and existing agro-ecological measures are strengthened with measures to combat climate change.

#### **Chapter IV: ORGANIC AGRICULTURE AND THE NATURAL ENVIRONMENT OF THE EUROPEAN UNION**

Chapter IV examines how organic agriculture has moved from an almost ideological movement into a strategic component of the European Union's agricultural, environmental, and climate policies. The chapter argues that this transformation did not happen spontaneously: it was the result of shifting consumer preferences, environmental pressures, institutional recognition, and, most importantly, the gradual alignment of organic farming with the long-term goals of the Common Agricultural Policy (CAP) and the European Green Deal.

A starting point of the chapter is the observation that over three quarters of the EU's territory is covered by agriculture and forests, which makes land use one of the decisive factors for the quality of the natural environment. Since the 1960s, European agriculture has been characterized by intensification, specialization, and commercialization. These processes improved productivity but also generated environmental externalities: soil degradation, biodiversity loss, nutrient leakage, pesticide residues, and pressure on water resources. Organic farming emerged precisely as a response to these effects. The early roots of the movement, traced to the 19th and early 20th centuries, were linked to concerns that synthetic fertilizers, pesticides, and industrial livestock systems would undermine soil health and human health. In the 1970s, with the creation of IFOAM (1972) and national organizations such as the Soil Association, this diffuse movement acquired structure, principles, and later certification schemes. What initially looked like a social movement became, in the 1980s and 1990s, a policy issue.

The EU's turn toward organic agriculture is clearly visible in the adoption of Council Regulation (EEC) 2092/91, which for the first time created a common EU framework for organic production and labelling. This was groundbreaking because it did two things at once: it created consumer trust (products labelled "organic" had to follow the same rules in all Member States) and it put organic farming inside, not outside, the CAP. The 1992 MacSharry reform, which began to shift support from pure price intervention toward rural development and agri-environmental schemes, gave organic farming its political entry point. From this stage onward, the EU started to see organic production not only as a lifestyle choice of farmers or consumers but as a policy instrument to deliver public goods: biodiversity, landscape management, lower pollution, and safer food.

The chapter shows that organic farming in the EU developed along two complementary axes: regulation and market growth. On the regulatory side, the EU kept updating the rules (later Regulation 834/2007 and, more recently, Regulation 2018/848) to clarify what counts as organic, how certification and control bodies should function, what inputs are allowed, and under what conditions exceptions may be granted. This was necessary because, as the market expanded, so did the risk of fraud, greenwashing, and misuse of labels. Harmonization was also needed to solve the problem of different national standards, which could undermine consumer confidence and create unfair competition between producers.

On the market side, the 1990s and 2000s were decades of exceptional growth. Demand for organic products increased at double-digit rates in countries like Germany, the UK, Denmark, Austria, and later France and Sweden. This demand was largely consumer-driven,

based on three perceptions: organic = healthier, organic = less chemical, and organic = better for the environment. Governments responded with national and regional organic action plans (17 national and 10 regional, as the chapter notes), incentives for conversion, and rural development measures. The EU Action Plan for Organic Food and Farming (2004) and later strategies were designed to coordinate this growth, to ensure that supply could follow demand, and to integrate organic farming with research, extension, and marketing.

A large empirical section of the chapter is devoted to the scale and geography of organic farming in the EU. By 2020, the EU had about 14.8 million hectares under organic management—around 9% of its utilized agricultural area, but almost 20% of the world’s organic land. Growth has been uneven: France, Spain, Italy, and Germany together account for more than half of the EU’s organic area, with France becoming the largest organic country in 2020. Some Member States (Austria, Estonia, Sweden) already exceed 20–25% organic share, while others (Ireland, Malta, parts of Eastern Europe) are far below 2–3%. This shows that organic farming in the EU is no longer a niche, but it is not yet a fully mainstream model either; it is regionally advanced but territorially unequal. The “conversion” area—land moving from conventional to organic—signals future growth, especially in Mediterranean countries and Romania.

The chapter also underlines three structural trends that shape European agriculture and to which organic farming is a response:

(1) intensification and specialization, which increase yields but reduce diversity and increase environmental pressure; (2) marginalization of remote or less-favored rural areas, where production is abandoned and landscapes deteriorate; and (3) the development of ecological/organic production as a socially and politically supported alternative, capable of creating jobs, preserving rural communities, and restoring consumer trust. Organic farming is thus presented not only as an environmental measure but as a rural development tool—especially important for small family farms and regions with high unemployment.

Organic farming in the EU is not left to the market. It is tightly embedded in the CAP through several channels: rural development (EAFRD) payments for conversion and maintenance, automatic eligibility for greening under Pillar I, support for producer organizations, and higher co-financing rates for organic producer groups. The chapter shows how the EU uses both regulatory instruments (common rules, certification, labelling, control bodies) and economic instruments (subsidies, eco-schemes, investment support, LEADER) to guide the sector. Member States have room to design national organic action plans, but they must fit within the EU strategy, especially after the Farm to Fork strategy and the 2021 Action

Plan for Organic Production, which set the political target of 25% organic land in the EU by 2030.

An interesting analytical part of the chapter is the comparison between the 2014–2022 and the 2023–2027 CAP periods. In the old period, support for organics was mainly in Pillar II (measure 11: conversion and maintenance), co-financed and sometimes administratively heavy. In the new period, the CAP introduces eco-schemes in Pillar I, and Member States can choose whether to pay conversion through Pillar I and maintenance through Pillar II, or the reverse. This makes organic farming part of the CAP's "green architecture" together with agri-environment-climate measures, Natura 2000 payments, and animal welfare interventions. The new model is more flexible but also more demanding: farmers must select and justify environmental actions, and Member States must prove that these actions help deliver Green Deal objectives.

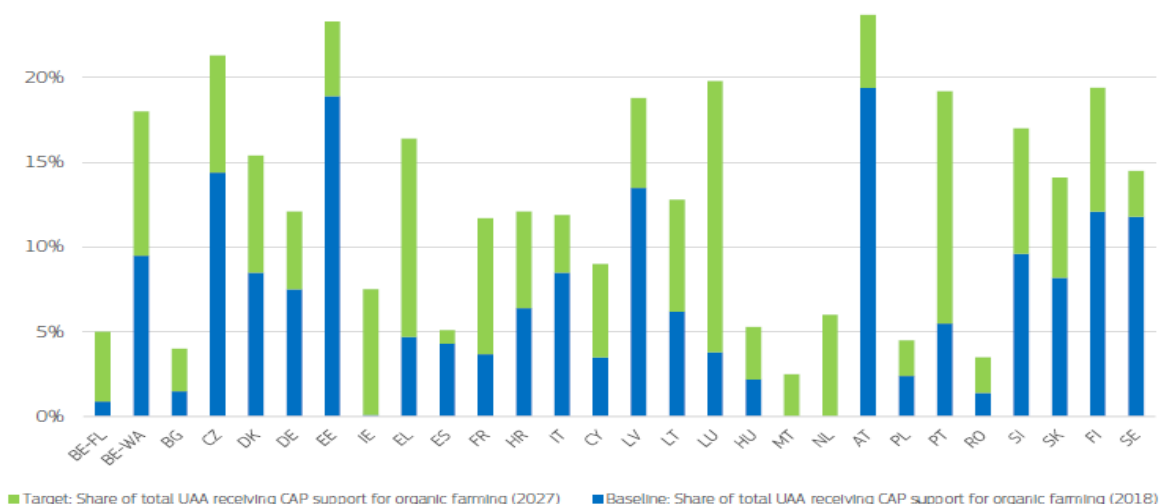
During the period 2023-2027, organic agriculture plays a stronger role and, following the "From Farm to Fork" strategy, it will have even greater importance than before. The CAP is a key instrument for achieving the objectives of the Green Deal, including the goals of the "From Farm to Fork" and Biodiversity strategies. One of these goals is to have 25% of EU agricultural land under organic farming by 2030 and a significant increase in organic aquaculture. In 2021, the Commission launched the "Action Plan for the Development of Organic Production" to support the achievement of this goal. Member states are now implementing the action plan through concrete policies in their national organic farming action plans and their CAP strategic plans (European Commission, 2020).

Member states were encouraged to specify national targets for organic farming (as part of the total utilized agricultural area by 2030) in their CAP strategic plans and to develop national organic farming action plans (NOAPs). Austria, Belgium-Wallonia, Germany, and Sweden have set the most ambitious targets, with 30% of the utilized agricultural area (UAA) to be achieved by 2030. However, the goals of member states are not directly comparable, as they are set for 2027 or 2030 (or not yet specified).

In their CAP strategic plans, member states have set target values for the results indicator measuring the proportion of their total UAA expected to receive support for organic farming by the end of the 2023-2027 period. According to the CAP strategic plans, all EU members have set their expected target numbers for the area under organic farming supported by the CAP. All EU members plan to increase the area receiving CAP support. At the EU level, it is expected that around 10% of the total UAA will receive CAP support for organic farming in 2027. However, there are significant differences: 18 CAP strategic plans are aimed at

supporting more than 10% of their UAA for organic farming with CAP funding, and 3 of them are aimed at over 20% (Austria, Czech Republic, and Estonia).

**Figure 1: Share of total UAA receiving CAP support for organic farming.**



Source: DG AGRI, based on approved CAP strategic plans.

**Table 8: CAP objectives**

Country	Share of UAA under organic farming, 2020 (baseline) <sup>57</sup>	National target values <sup>58</sup> of share of UAA to be under organic farming	Share of UAA receiving organic CAP support, 2018 (baseline)	Expected share of UAA receiving organic CAP support (2027) <sup>59</sup>
BE-Flanders <sup>60</sup>	1,5%	N/A	0,9%	5,0%
BE-Wallonia <sup>60</sup>	12,5%	30,0%	9,5%	18,0%
BG	2,3%	7,0%*	1,5%	4,0%
CZ	15,3%	N/A	14,4%	21,3%
DK	11,5%	20,0%	8,5%	15,4%
DE	9,6%	30,0%	7,5%	12,1%
EE	22,4%	N/A	18,9%	23,3%
IE	1,7%	7,5%*	0,1%	7,5%
EL	10,2%	N/A	4,7%	16,4%
ES	10,0%	20,0%	4,3%	5,1%
FR	8,7%	18,0%*	3,7%	11,7%
HR	7,2%	12,1%	6,4%	12,1%
IT	16,0%	25,0%*	8,5%	11,9%
CY	4,4%	10,0%	3,5%	9,0%
LV	14,8%	20,0%*	13,5%	18,8%
LT	8,0%	15,0%	6,2%	12,8%
LU	4,6%	N/A	3,8%	19,8%
HU	6,0%	10,0%*	2,2%	5,3%
MT	0,6%	5,0%	0,0%	2,5%
NL	4,0%	N/A	0,0%	6,0%
AT	25,3%	30,0%	19,4%	23,7%
PL	3,5%	7,0%	2,4%	4,5%
PT	8,1%	N/A	5,5%	19,2%
RO	3,5%	N/A	1,4%	3,5%
SI	10,8%	18,0%	9,6%	17,0%
SK	11,7%	20,0%	8,2%	14,1%
FI	13,9%	25,0%	12,1%	19,4%
SE	20,3%	30,0%	11,8%	14,5%

Source: CAP Strategic Plans

## CONCLUSIONS

Sustainable development is a path for achieving long-term food security and social well-being. Agriculture plays a central role in feeding the population while maintaining environmental balance. Within the European Union, agricultural development is shaped by the Common Agricultural Policy.

Initially, the ecological dimension of sustainability was largely absent from the CAP, which prioritized production growth, often at the expense of environmental health. This imbalance led to a series of policy reforms, starting in 1992, that gradually reoriented the CAP toward sustainable natural resource management. The introduction of the second CAP pillar—rural development policy—through Agenda 2000, showed an institutional commitment to environmental issues, though funding remained limited through the 20th century.

The 2003 Fischler reform marked a significant shift, emphasizing environmental compliance and supporting measures such as water protection, agroforestry, and climate adaptation. This was expanded in 2008 to address emerging challenges like climate change and biodiversity loss through ecological measures promoting renewable energy and sustainable water use. The 2013 CAP reform further embedded environmental goals by introducing the greening of direct payments, which led to modest reductions in greenhouse gas emissions and improved environmental conditions, though without achieving full targets for soil, air, and water quality.

Subsequent reforms (2023–2027) continue these efforts, emphasizing eco-schemes, generation renewal, and regional development, risk management, and cooperative approaches. The evolution of CAP reforms reveals increasingly targeted and diversified ecological measures, with climate change and resource efficiency emerging as central objectives. Environmental protection is now more structurally integrated into CAP instruments, promoting sustainability in agricultural practices.

Technological innovation also plays a leading role. Precision agriculture and smart technologies enhance resource use efficiency and reduce environmental impact. At the same time, organic farming is expanding, supported by EU subsidies and regulatory frameworks that promote biodiversity, soil health, and reduced chemical inputs. Biodiversity conservation remains a vital component, with measures encouraging ecological focus areas and preservation of semi-natural habitats.

The European Green Deal (2019) and Farm to Fork Strategy further advance sustainable agriculture by setting ambitious targets for reducing chemical inputs and expanding organic

production. These initiatives aim to foster resilient food systems and mitigate climate risks. Complementary climate-smart agricultural practices—such as drought-resistant crops, water-saving irrigation, and soil conservation—enhance resilience and sustainability across EU farming systems.

Based on the study the following conclusions can be outlined:

- The integration of environmental concerns into the Common Agricultural Policy (CAP) has significantly evolved since the early 1990s, transitioning from production-oriented support mechanisms to a more balanced approach that emphasizes sustainability, biodiversity, climate change mitigation, and resource efficiency.
- The concept of sustainable development has become a core principle in EU agricultural policy, influencing both the strategic objectives of the CAP and the formulation of specific agri-environmental instruments. The inclusion of environmental targets in CAP strategic plans, particularly after the 2013 and 2023 reforms, reflects a paradigm shift toward eco-centric agricultural governance.
- Organic agriculture has emerged as a central component of the EU's environmental and food strategies, with growing institutional, financial, and market support. The expansion of organic farming contributes to improved soil quality, reduced chemical input use, and enhanced biodiversity, though disparities in uptake among Member States remain a challenge.
- The empirical analysis of the relationship between economic and environmental performance in agriculture reveals a complex and often nonlinear dynamic. The Environmental Kuznets Curve (EKC) hypothesis is partially validated: in some Member States, higher agricultural productivity is associated with better environmental performance, while in others, economic gains come at the expense of ecological integrity.
- The Environmental Performance Index (EPI) and agroecological indicators prove to be valuable tools for measuring environmental outcomes, allowing cross-country comparisons and supporting evidence-based policy adjustments.
- Agri-environmental measures and green payments have positive environmental impact, yet their influence is uneven across Member States due to variations in policy implementation, administrative capacities, and farmer engagement.

The evolution of the Common Agricultural Policy reflects the EU's commitment to integrating sustainability into agricultural practices. The reforms over the years have

progressively addressed environmental concerns, leading to the implementation of various agro-ecological measures aimed at protecting natural resources and promoting sustainable development. The continued focus on sustainability, efficiency, and resilience in agricultural practices is essential for meeting the challenges of feeding a growing population while preserving the environment for future generations. The European Union's efforts to promote sustainable agriculture serve as a model for balancing economic, environmental, and social goals, demonstrating that sustainable development is achievable through coordinated policy actions and innovative practices.

## **RECOMMENDATIONS**

The environmental challenges across Europe intensify, ranging from biodiversity loss and ecosystem degradation to rising greenhouse gas emissions. The EU faces growing pressure to transition from fragmented environmental interventions toward a holistic, system-based sustainability strategy. Building on the European Green Deal and its complementary initiatives, such as the Farm to Fork and Biodiversity Strategies, the EU must pursue structural reforms that embed sustainability across all levels of governance, production, and finance. The research conducted over the past three years highlights the necessity of rethinking traditional agricultural and environmental instruments, emphasizing both institutional reform and practical implementation measures as pillars for long-term ecological resilience and socio-economic equity.

### **Institutional Reforms and Policy Integration**

A key institutional priority lies in reforming the architecture of the Common Agricultural Policy. Despite the progress achieved through the 2023–2027 programming period, CAP still exhibits inefficiencies, particularly in the distribution of subsidies and their environmental coherence. To align agricultural policy with the EU's climate and biodiversity objectives, a larger share of CAP funding should be directed toward performance-based payments for ecosystem services and measurable environmental outcomes. This shift entails phasing out market-distorting instruments such as coupled payments and price interventions while linking financial support directly to sustainable practices, carbon sequestration, and biodiversity enhancement.

Equally important is the reallocation of CAP resources to smaller and medium-sized farms, which are often more ecologically sustainable but institutionally disadvantaged. Ensuring fairer subsidy distribution will not only enhance environmental outcomes but also

strengthen social cohesion and rural resilience. The CAP must also evolve from a reactive compensation system to one focused on ex ante climate adaptation, emphasizing preventive investments in risk management, water retention, and soil conservation. Integrating CAP implementation with other EU regulatory frameworks—such as the Water Framework Directive, Nitrates Directive, and EU Climate Law—will enable coherent policy delivery and avoid institutional fragmentation.

Further reforms should introduce a clear distinction between income support and environmental payments, enhancing transparency and facilitating the creation of dedicated co-financing streams for ecosystem protection. Generational renewal and access to farming are also vital: younger and underrepresented farmers must receive targeted support through land access schemes, green credit instruments, and innovation-based incentives. The long-term sustainability of the agri-food system depends on attracting a new generation of farmers equipped with technological and environmental competencies.

The EU's regulatory environment must likewise be redesigned to better encourage innovation and policy coherence. Regulatory impact assessments should evaluate innovation trade-offs and synergies before adopting new measures, especially regarding GMOs, gene-editing technologies, and pesticide restrictions. All new environmental regulations should adhere to SMART criteria, ensuring that policy ambitions are both scientifically grounded and operationally feasible. Outcome-based regulation, exemplified by the Nature Restoration Regulation, should serve as a model for designing future legislation.

The EU's data and monitoring frameworks are another critical institutional component. Strengthening the Farm Sustainability Data Network (FSDN) and expanding the coverage of agri-environmental indicators will enable data-driven decision-making and more accurate assessments of CAP performance. A harmonized and interoperable data infrastructure across Member States will allow for better benchmarking of sustainability outcomes, policy evaluation, and public accountability. Digital tools—including satellite imaging, AI-driven analysis, and geospatial monitoring—should be fully integrated into CAP reporting systems, enhancing real-time tracking of land use, soil conditions, and biodiversity.

Furthermore, CAP support must explicitly target the digital transformation of rural areas. Funding for Digital Innovation Hubs, advisory platforms, and digital training will bridge the gap between technological potential and practical adoption, particularly among small and older farmers. Expanding digital advisory services will professionalize knowledge dissemination, foster collective learning, and increase the uptake of sustainable farming practices.

### **Innovative Mechanisms and Collective Action**

To deliver tangible environmental results, the EU should promote result-based Payment for Environmental Services frameworks. Unlike traditional compliance-based schemes, these approaches directly reward farmers for measurable ecological outcomes such as carbon storage, soil fertility improvement, or biodiversity conservation. These programs should include clear baseline assessments, local environmental diagnostics, and monitoring through satellite or sensor-based systems. Collective schemes, implemented through farmer groups, cooperatives, or local councils, can scale up impact, reduce administrative burdens, and foster shared responsibility for environmental stewardship.

Participatory governance is another key dimension of institutional reform. Broader stakeholder engagement, including civil society, scientific institutions, and local communities, will improve the legitimacy, feasibility, and social equity of sustainability measures. Member States should embed agroecological principles into their CAP Strategic Plans and report regularly on sustainability progress, supported by transparent, outcome-oriented evaluation frameworks.

### **Strengthening Climate and Financial Frameworks**

The European Green Deal remains the overarching strategy for achieving net-zero emissions by 2050. However, to maintain credibility and momentum, the EU should establish binding interim climate targets and integrate climate screening across all legislative and financial proposals. The CAP, given its scale and historical environmental footprint, must serve as a cornerstone of this transition-linking payments explicitly to measurable improvements in soil health, carbon balance, and landscape restoration.

In parallel, the EU must institutionalize green finance and investment standards. Expanding the scope of the EU Taxonomy Regulation to include natural capital and circular economy principles will strengthen financial coherence. Public and private investment portfolios must be aligned with sustainability criteria, ensuring that green finance flows into environmentally sound sectors. The EU Emissions Trading System (ETS) should be extended to additional sectors, including shipping, buildings, and road transport, with the gradual elimination of free allowances. The Carbon Border Adjustment Mechanism (CBAM) will complement this by preventing carbon leakage and maintaining competitiveness.

### **Practical Implementation Measures**

On the operational level, the EU's sustainability transition requires coordinated action across energy, transport, housing, and resource management. Accelerating renewable energy

deployment and modernizing grid infrastructure will be essential to achieving 2030 targets, while investing in decentralized systems will enhance resilience. The Renovation Wave initiative should focus on improving energy efficiency in buildings, prioritizing public and low-income housing.

Transitioning to a circular economy demands EU-wide mandates on product repairability, recyclability, and material traceability, alongside Extended Producer Responsibility schemes that hold manufacturers accountable for waste reduction. Urban sustainability should be supported through electrified public transport, cycling infrastructure, and “15-minute city” planning models that reduce emissions and improve quality of life.

Moreover, nature-based solutions, such as wetland restoration, afforestation, and soil rehabilitation—must become mainstream components of EU environmental policy. Implementing the Nature Restoration Law, coupled with targeted funding, can reverse biodiversity loss and enhance ecosystem services.

### **Enabling Conditions and Systemic Support**

For these reforms to succeed, the EU must cultivate enabling conditions that integrate education, technology, and public participation. Environmental literacy and civic engagement are crucial: informed citizens are more likely to support and participate in sustainable initiatives. Digital tools, including AI and sensor networks, will enhance transparency, compliance monitoring, and adaptive management.

Externally, the EU must align its trade and development policies with sustainability goals. Trade agreements should include binding environmental clauses, while international development cooperation should focus on climate adaptation and resource efficiency. Finally, harmonizing environmental metrics and reporting standards across Member States will ensure consistent evaluation of progress, enabling policy learning and accountability.

The European Union stands at a pivotal juncture in its sustainability journey. The effectiveness of future reforms will depend on the EU’s ability to transition from compliance-based frameworks to performance-oriented, data-driven governance. By integrating institutional reform, technological innovation, and participatory governance, the EU can build a coherent, equitable, and resilient system that balances economic growth with environmental integrity. A systems-based approach anchored in evidence, innovation, and inclusivity offers the most promising path toward realizing the EU’s ecological transformation and securing prosperity for future generations.

## CONTRIBUTION OF THE PHD THESIS

### Scientific - Theoretical Contributions

1. **Conceptual Integration of Sustainable Development and Agricultural Policy-** The dissertation provides a synthesis between the theoretical principles of sustainable development and the operational mechanisms of the Common Agricultural Policy of the European Union. It develops a comprehensive conceptual framework that integrates environmental, economic, and social dimensions of sustainability within the context of modern agricultural policy, emphasizing the role of the CAP as both an economic and environmental governance instrument.
2. **Clarifying of the Relationship between Economic and Environmental Performance in Agriculture-** Through theoretical and empirical analysis, the research systematizes the interdependencies between agricultural productivity, environmental degradation, and ecological resilience.
3. **Evolutionary Perspective on the Common Agricultural Policy-** A novel theoretical contribution lies in the systematization of CAP reforms through the perspective of sustainability. The thesis demonstrates how successive CAP reforms reflect an evolving paradigm-from productivity-oriented support toward environmentally integrated policy instrument.
4. **Extension of the Environmental Performance Index (EPI) to the Agricultural Context-** The study adapts and applies the EPI framework to assess agricultural sustainability across EU Member States. This represents a methodological and theoretical contribution that links macro-level environmental indicators with sectoral agricultural performance, allowing for cross-national comparability of ecological outcomes.

### Scientific - Practical Contributions

1. **Empirical Evaluation of Agricultural and Environmental Performance in the EU.** Based on comparative statistical analysis, the dissertation offers empirical evidence on the correlation between agricultural economic output and environmental performance among EU countries. The findings provide a quantitative foundation for policy-making, revealing that states with higher technological adoption and agroecological integration exhibit better environmental indicators without compromising productivity.

**2. Assessment of the Effectiveness of CAP Environmental Instruments.**

The research systematically evaluates agroecological measures, eco-schemes, and organic farming interventions under successive CAP programming periods (2014–2020 and 2023–2027). It identifies gaps between policy design and implementation, offering concrete recommendations for improving the effectiveness and efficiency of CAP’s environmental architecture.

**3. Policy Recommendations for Long-Term Environmental Sustainability.**

The dissertation formulates an integrated set of institutional and operational recommendations for reforming the CAP and related EU environmental policies. They include performance-based payments for ecosystem services, stronger monitoring systems, harmonization of environmental data, and improved coordination between agricultural, water, and climate legislation.

## **PUBLICATIONS RELATED TO THE PHD THESIS**

- 1.** Arifi, J., 2026. *Exploring the dynamics of export performance in the Balkans: A GMM panel data approach*. *South East European Journal of Sustainable Development*, Vol. 10 (1/2026), pp. 205–218, ISSN (print) 2545-4463, ISSN (online) 2545-4471.
- 2.** Arifi, J., 2026. *Modeling risk strategy formation: the role of managerial experience and business characteristics*. *South East European Journal of Sustainable Development*, Vol. 10 (2/2026), pp. 192–211, ISSN (print) 2545-4463, ISSN (online) 2545-4471.
- 3.** Arifi, J., 2026. *Institutional and economic determinants of exports: evidence from western Balkan countries*. *South East European Journal of Sustainable Development*, Vol. 10 (2/2026), pp. 212–232, ISSN (print) 2545-4463, ISSN (online) 2545-4471.