

European Programmes as a Factor for the Ecological Development of Rural Areas in Bulgaria

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ABSTRACT

Rural areas in Bulgaria are undergoing a gradual ecological transformation, strongly influenced by European Union programmes and financial mechanisms. This study examines the extent to which EU instruments – including the Common Agricultural Policy (CAP), the European Agricultural Fund for Rural Development (EAFRD), the LIFE Programme, Horizon Europe, and Bulgaria's national operational programmes – contribute to environmental improvements in rural communities. The analysis is based exclusively on official institutional datasets and policy documents issued by the European Commission, Eurostat, the Bulgarian Ministry of Agriculture, and the Ministry of Environment and Water. Results indicate that European funding has played a critical role in advancing soil and water management, biodiversity conservation, organic farming growth, climate resilience, and the expansion of environmentally responsible land-use practices. At the same time, the study identifies persistent challenges such as administrative complexity, uneven beneficiary participation, technological limitations, and significant regional disparities in ecological outcomes. The findings highlight that while EU programmes remain indispensable for rural ecological development in Bulgaria, their long-term effectiveness depends on simplified procedures, strengthened local capacity, and better integration between environmental and socio-economic objectives.

Keywords: *European programmes, Rural development, Ecological sustainability, Common Agricultural Policy (CAP), EAFRD, Biodiversity conservation, Environmental protection, Sustainable land management*

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INTRODUCTION

Environmental sustainability has become one of the central pillars of European rural development policy. Over the last two decades, the European Union has progressively integrated ecological objectives



into its financial instruments, regulatory requirements, and agricultural policy frameworks, transforming the way member states approach land management, biodiversity conservation, and climate adaptation. For Bulgaria, a country where rural territories encompass nearly 80% of the national territory and include some of the most valuable ecosystems in Southeast Europe, access to European programmes has become essential for achieving long-term ecological progress. Many rural municipalities face structural constraints such as demographic decline, limited municipal budgets, outdated infrastructure, and insufficient administrative capacity. Previous research shows that Bulgarian rural communities often face similar administrative and financial barriers when accessing European funds, which directly influences the effectiveness of ecological and rural development initiatives (Karadzhov, 2015). These challenges restrict their ability to implement ambitious environmental projects without external assistance, making EU funding not only beneficial but often indispensable.

Since Bulgaria's accession to the European Union in 2007, European programmes have played a decisive role in shaping national policy priorities and redirecting development efforts toward sustainability. The shift is especially visible in the evolution of the Common Agricultural Policy (CAP), which has transitioned from a primarily production-oriented mechanism into a policy framework increasingly centred on environmental stewardship, soil protection, biodiversity conservation, and climate resilience.

Through both mandatory conditionality standards and voluntary eco-schemes, the CAP encourages Bulgarian farmers to adopt practices that reduce environmental pressure and support ecological balance. The enhanced environmental orientation of the CAP aligns with broader EU strategic documents, including the **European Green Deal**, the **Farm to Fork Strategy**, and the **EU Biodiversity Strategy for 2030**, all of which promote climate neutrality, circular economy principles, and nature-based solutions.

Table 1 – EU Programmes and Funds (2021-2027) Relevant to Rural Areas

Programme / Fund	Budget 2021–2027
European Agricultural Fund for Rural Development (EAFRD)	€95.51 billion
European Agricultural Guarantee Fund (EAGF)	€291.09 billion
Common Agricultural Policy (CAP)	€386.6 billion
European Regional Development Fund (ERDF)	€226 billion
Cohesion Fund (CF)	€48 billion
Cohesion Policy (ERDF + CF + ESF+)	€392 billion
European Social Fund Plus (ESF+)	€142.7 billion
Just Transition Fund (JTF)	€19.32 billion
LIFE Programme (Environment & Climate Action)	€5.432 billion
European Maritime, Fisheries and Aquaculture Fund (EMFAF)	€6.108 billion
Horizon Europe	€95.5 billion
European Innovation Council (EIC)	€10.1 billion
InvestEU	10.28 billion
Connecting Europe Facility (CEF)	€20.7 billion
Interreg (European Territorial Cooperation)	€10 billion

Beyond agriculture, other major European instruments – notably the European Agricultural Fund for Rural Development (EAFRD), the LIFE Programme, Horizon Europe, and Bulgaria's operational programmes – complement CAP interventions by funding conservation activities, ecological restoration, innovation in sustainable land use, and improvements in environmental governance. LIFE-funded biodiversity initiatives, for example, play a critical role in strengthening the Natura 2000 network, which covers a significant portion of rural Bulgaria. Similarly, the Operational Programme “Environment” channels investment into wastewater treatment, air quality, waste management, and ecological monitoring systems, addressing environmental challenges that extend beyond agricultural land.



Despite this extensive support framework, the degree to which EU programmes translate into tangible ecological improvements varies across regions. Differences in municipal capacity, farmer awareness, access to information, and local socio-economic conditions influence the effectiveness of policy implementation. Some areas demonstrate significant progress in organic farming, ecological restoration, and soil protection, while others face obstacles such as technological gaps, administrative burden, or limited participation in environmental schemes.

Given these dynamics, a comprehensive analysis of European programmes as drivers of ecological development in rural Bulgaria is both timely and necessary. It allows for the identification of achievements, structural limitations, regional disparities, and the potential for improved policy alignment. This article therefore explores (1) the mechanisms through which EU funding influences rural ecological development, (2) the observed environmental outcomes based on official institutional data, and (3) the challenges that continue to hinder consistent ecological progress across rural territories. By integrating the latest datasets from the European Commission, Eurostat, and Bulgarian ministries, the study provides an updated, empirically grounded assessment of the role European programmes play in catalysing ecological transformation in rural Bulgaria.

LITERATURE REVIEW

Existing academic research consistently highlights the growing environmental orientation of European Union policies, particularly within the rural and agricultural sectors. Scholars observe that the gradual transformation of the Common Agricultural Policy (CAP) from a mechanism primarily supporting agricultural production into a policy framework centered on sustainability has significantly influenced farmers' practices and decision-making across member states. This shift includes not only the strengthening of conditionality requirements but also the development of eco-schemes, which reward environmentally beneficial farming activities such as crop diversification, carbon-friendly practices, and biodiversity protection. Studies further emphasize the importance of the European Agricultural Fund for Rural Development (EAFRD) in financing long-term ecological commitments.

Research shows that EAFRD-supported agri-environmental and climate measures have been key drivers behind the adoption of organic production, sustainable forest management, and soil and water conservation techniques in various EU countries. In many cases, these programmes help fill institutional gaps in regions with limited national environmental funding. Bulgarian academic contributions complement these European perspectives by outlining structural challenges specific to rural areas of the country.

Studies on sustainable rural development further highlight persistent issues such as demographic decline, economic marginalization, and disparities in the utilization of EU financial mechanisms (Shishmanova & Karadzhov, 2015). Local researchers frequently point to persistent constraints such as limited municipal budgets, demographic decline, insufficient technological modernization, and gaps in environmental monitoring capacity.

Publications underline that many Bulgarian rural municipalities lack the administrative resources needed to plan and implement complex ecological projects without external support. As a result, EU funds are often viewed not simply as an additional source of financing but as a necessary foundation for the country's environmental progress. Furthermore, several studies stress that Bulgaria's ecological policies remain deeply interconnected with EU strategic priorities, including the European Green Deal, the Biodiversity Strategy, and the Farm to Fork Strategy. These frameworks increasingly shape national decision-making, encouraging the adoption of nature-based approaches, circular economy principles, and climate-adaptation strategies.

The present study builds upon this body of literature by integrating the most recent datasets from Eurostat, updated policy documents from the European Commission, and the latest annual reports issued by the Bulgarian Ministry of Agriculture and the Ministry of Environment and Water. Through this approach, the article offers a refreshed and empirically grounded perspective on the role of European



programmes as a catalyst for ecological transformation in rural Bulgaria, highlighting both their achievements and their limitations.

Transformation of EU rural and agricultural policy

Recent literature highlights that ecological objectives have become central to EU rural and agricultural policies, particularly after the reform of the Common Agricultural Policy (CAP). Researchers document a decisive shift from production-oriented subsidies toward sustainability-focused governance, including strengthened conditionality, eco-schemes, and targeted agri-environmental measures (Matthews, 2018; Pe'er et al., 2019). This policy evolution aligns with broader European strategies such as the EU Biodiversity Strategy and the European Green Deal, which place increasing emphasis on climate mitigation, biodiversity recovery, and the promotion of environmentally responsible farming (Hermoso et al., 2022). Studies show that such policy changes influence agricultural decisions, land-use patterns, and long-term ecological outcomes across member states, especially in rural regions with high environmental value (Paracchini & Britz, 2019).

Recent assessments also highlight the growing role of climate adaptation priorities in shaping rural environmental policy. With increasing frequency of droughts, erosion events, and extreme weather conditions in Bulgaria, EU frameworks now emphasize climate-resilient agricultural landscapes and adaptive land-use planning. These priorities encourage farmers and local authorities to adopt practices that enhance soil moisture retention, increase agro-biodiversity, and reduce exposure to climate-related risks.

Ecological impacts of agri-environmental schemes and EU funding

A substantial body of literature examines how Natura 2000 influences the ecological governance of rural landscapes. Studies demonstrate that protected areas supported by EU directives play a critical role in safeguarding habitats and species, particularly in biodiversity-rich regions (Orlikowska et al., 2016). However, researchers note that the ecological effectiveness of Natura 2000 depends heavily on local administrative capacity, stakeholder engagement, and the availability of financial resources for active management (Hermoso et al., 2022). For rural countries such as Bulgaria, where large areas fall under Natura 2000 designation, the integration of EU conservation instruments with national and local governance systems is key to achieving measurable ecological improvements.

In addition to conservation outcomes, agri-environmental schemes have contributed to improved socio-economic conditions in rural regions by generating new employment opportunities linked to ecological restoration, green services, and organic production. This multifaceted impact reflects the EU's broader strategy of linking environmental protection with rural vitality, ensuring that ecological measures create tangible benefits for local communities and encourage long-term engagement.

Persistent challenges and uneven regional impacts

Despite substantial funding, research consistently identifies structural challenges that reduce the ecological impact of EU programmes. Complex administrative procedures, limited technical expertise, and burdensome bureaucratic requirements can restrict participation among smaller farms and rural municipalities (Dwyer & Hodge, 2016). Furthermore, several studies highlight persistent regional inequalities in the absorption of EU funds, with economically marginal and mountainous regions benefiting less from available environmental measures (Shucksmith et al., 2021). Monitoring and evaluation systems also remain insufficient in many member states, which limits the ability to assess long-term ecological outcomes of CAP interventions (Pe'er et al., 2020). These challenges underline the importance of improving governance capacity, simplifying procedures, and developing territorially sensitive approaches to ecological rural development. Recent Bulgarian geographical research also emphasizes that ecological and socio-economic transformations in rural territories are closely linked to spatial urbanization dynamics and regional planning processes (Filatova & Patarchanova, 2025).

A further concern raised in recent studies relates to the limited public awareness of EU ecological measures, which restricts the ability of rural residents to participate fully in available programmes. Insufficient communication campaigns, low digital literacy, and fragmented advisory services often



reduce the visibility of funding opportunities. Strengthening informational outreach and expanding local advisory networks would increase participation, particularly among young farmers and smallholders.

MATERIALS & METHODS

The methodological framework of this study combines qualitative and quantitative approaches in order to provide a comprehensive assessment of the ecological impact of European programmes on rural areas in Bulgaria. The methods were selected in accordance with established research standards in environmental policy analysis, with a focus on data reliability, institutional transparency, and cross-comparability within the European Union.

Data Sources

The analysis relies exclusively on official and publicly accessible institutional data, ensuring high credibility and reproducibility. The primary sources include: European Commission: CAP Strategic Plan for Bulgaria (2023–2027), programme implementation reports, DG AGRI and DG ENV official documents. Eurostat: agricultural, environmental, rural development, and climate indicators at EU and national level. Bulgarian Ministry of Agriculture and Food (MAF): annual agricultural reports, EAFRD implementation bulletins, statistical yearbooks. Ministry of Environment and Water (MOEW): national environmental performance reports, biodiversity and water management assessments. Official LIFE programme databases: project descriptions, progress reports, and outcome evaluations.

Document and Policy Analysis

A structured document analysis was undertaken to interpret the regulatory frameworks, strategic priorities, and environmental objectives embedded in EU and Bulgarian policy documents. This included: comparative examination of policy changes across programming periods (2007–2013; 2014–2020; 2021–2027); identification of sustainability requirements integrated into CAP conditionality and eco-schemes; mapping of environmental themes across operational programmes and LIFE-funded initiatives. This qualitative component helped contextualize the statistical findings and reveal the policy logic driving ecological interventions.

Quantitative Statistical Assessment

Quantitative evaluation was conducted using Eurostat and national datasets covering: land-use structure and agricultural intensity; organic farming expansion; biodiversity condition indicators; resource efficiency (water, soil, nutrients); greenhouse gas emissions from agriculture; municipal waste and wastewater treatment performance.

Where possible, ten-year longitudinal data were examined to identify trends before and after the introduction of key EU environmental instruments. The indicators were analyzed descriptively due to differences in temporal coverage and regional granularity.

Case Study Selection and Analysis

Three representative case studies of EU-supported ecological interventions were selected based on publicly available documentation and relevance to rural Bulgaria. Projects were chosen according to the following criteria: explicit environmental objectives (e.g., biodiversity restoration, water management improvement); implementation within rural municipalities or farming communities; availability of detailed project reports and outcomes; representativeness for broader national challenges. Each case study was reconstructed through systematic review of official reports, project summaries, and evaluation documents, enabling triangulation with the broader national data.

KEY EU PROGRAMMES INFLUENCING RURAL ECOLOGICAL DEVELOPMENT

Common Agricultural Policy (CAP)

The CAP remains the primary EU mechanism affecting agricultural and rural environmental practices. In the current programming period, the emphasis has shifted toward: ecological conditionality for all direct payments; eco-schemes rewarding biodiversity-friendly and climate-smart practices; long-



term agri-environmental commitments under EAFRD. Bulgaria's CAP Strategic Plan places notable focus on soil protection, erosion mitigation, preservation of high-nature-value farmlands, and limiting chemical input overuse.

In addition, the CAP encourages member states to integrate climate mitigation objectives into national interventions, thereby ensuring that agricultural production contributes to long-term ecological resilience.

European Agricultural Fund for Rural Development (EAFRD)

EAFRD provides targeted support for: organic farming expansion; sustainable livestock and crop systems; environmentally oriented forest management; energy-efficient farm investments; rural green infrastructure.

For many small farms and rural municipalities, EAFRD is the only available funding source for environmental transformation. Earlier empirical surveys confirm that although EU funds are widely accessible, their uptake varies substantially across regions, with mountainous and remote areas often demonstrating lower utilization rates due to administrative difficulties and limited technical capacity (Karadzhev, 2014). Moreover, EAFRD-funded cooperation projects increasingly promote collective landscape-level actions, enabling coordinated efforts among farmers, municipalities, and environmental organisations.

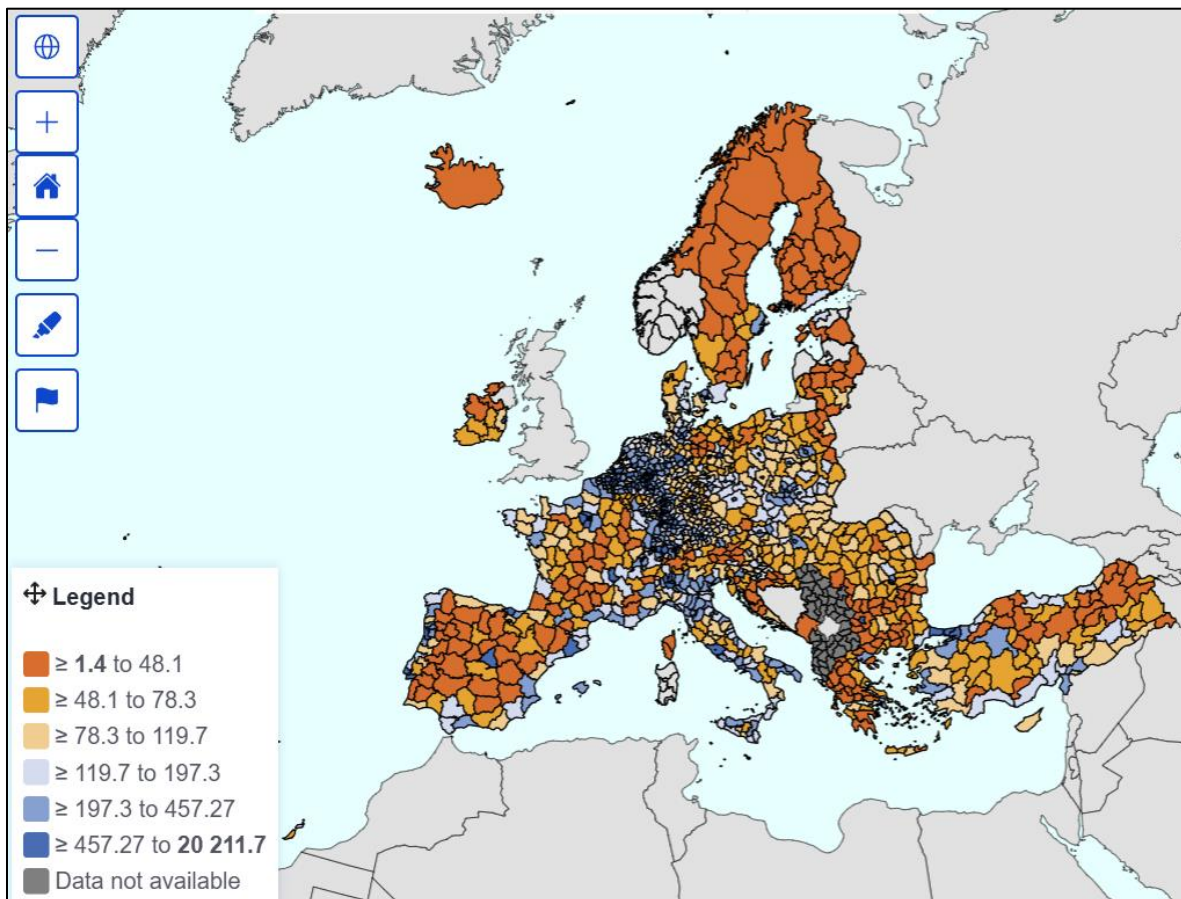


Figure 1. Population density by NUTS 3 region. *Source: Eurostat*

LIFE Programme

The LIFE Programme fills policy gaps by supporting projects beyond the agricultural domain, such as: restoration of wetland and grassland ecosystems; protection of endangered species; waste reduction and circular economy pilots; monitoring of climate and environmental indicators. Many Bulgarian LIFE projects serve as national best-practice models.

Importantly, LIFE-funded initiatives often introduce innovative management practices that are later incorporated into national conservation policies and replicated across multiple rural regions.

Horizon Europe

Horizon Europe contributes indirectly by generating research, technology, and digital innovation applicable to ecological rural development, including: precision farming technologies; nature-based climate solutions; environmental modeling and remote sensing tools.

Furthermore, Horizon Europe fosters cross-border scientific collaboration, allowing Bulgarian institutions to participate in advanced research networks and adopt cutting-edge environmental technologies.

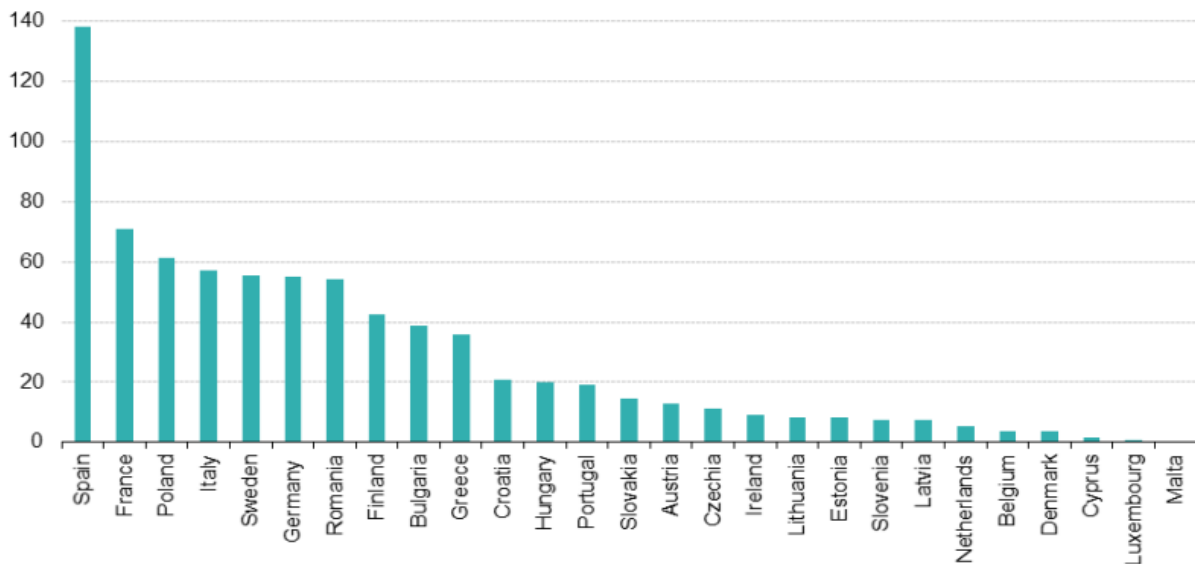
National Operational Programmes

Two national programmes play a central role: **Operational Programme “Environment”**: wastewater, biodiversity, waste, and air quality. **Operational Programme “Regions in Growth”**: green public infrastructure and energy efficiency in small settlements. These complement CAP and LIFE interventions by addressing non-agricultural environmental priorities.

The State of Ecological Conditions in Bulgarian Rural Areas

Rural regions in Bulgaria occupy a substantial portion of the national territory while accommodating a comparatively small and steadily declining share of the population. Many of these municipalities are characterized by low population density, pronounced demographic ageing, and outward migration. This demographic profile, combined with the country’s extensive agricultural landscapes, influences the ability of local communities to manage natural resources effectively and to implement environmentally sustainable practices. The ecological state of Bulgaria’s rural areas reflects the interaction between significant natural assets, pressures deriving from agricultural production, and long-standing socio-economic constraints.

Natura 2000 protected terrestrial area, 2020
(thousand km²)



Source: EEA/ European topic centre on biodiversity; Eurostat (online data code: env_bio1)



Figure 2. Natura 2000 protected terrestrial area, 2020. Source: Eurostat

Much of rural Bulgaria is endowed with remarkable biological diversity, broad forested territories, and a comprehensive network of Natura 2000 sites. These areas play a crucial role in preserving ecosystems, safeguarding rare and endemic species, and contributing to national ecological stability. Soil conditions vary considerably from region to region. While parts of the countryside maintain favourable



levels of organic matter and nutrients, other territories experience processes of soil degradation, including erosion, acidification, and disrupted nutrient balances. Water resources are also subject to environmental pressures. Intensive agricultural activity can lead to nitrate contamination, inefficient irrigation systems, and decreasing water quality in both surface and groundwater bodies.

Biodiversity represents one of the country's most valuable ecological features. Rural landscapes support numerous protected habitats, rare flora, and diverse populations of birds and mammals. Nevertheless, these ecosystems continue to face risks linked to landscape fragmentation, agricultural intensification, and the abandonment of traditional land-management practices. Although Bulgaria's Natura 2000 network covers large areas and offers essential protection, ongoing conservation measures and active management are necessary to maintain long-term ecological integrity. Socio-economic trends exert further influence on environmental conditions.

Continuous depopulation, limited employment opportunities, and constrained municipal budgets weaken the institutional capacity to introduce, monitor, and sustain environmental policies. These challenges restrict the spread of environmentally friendly agricultural approaches and reduce the overall capacity for sustainable stewardship of natural resources.

Despite these constraints, rural Bulgaria possesses considerable potential for ecological progress. Growing interest in eco-tourism, expansion of organic agriculture, and increased participation in EU-funded conservation initiatives indicate positive shifts in rural environmental governance. Strengthening land-use planning, promoting climate-resilient farming systems, and enhancing institutional capacity are essential steps in ensuring the sustainable management of Bulgaria's rural ecosystems over the long term.

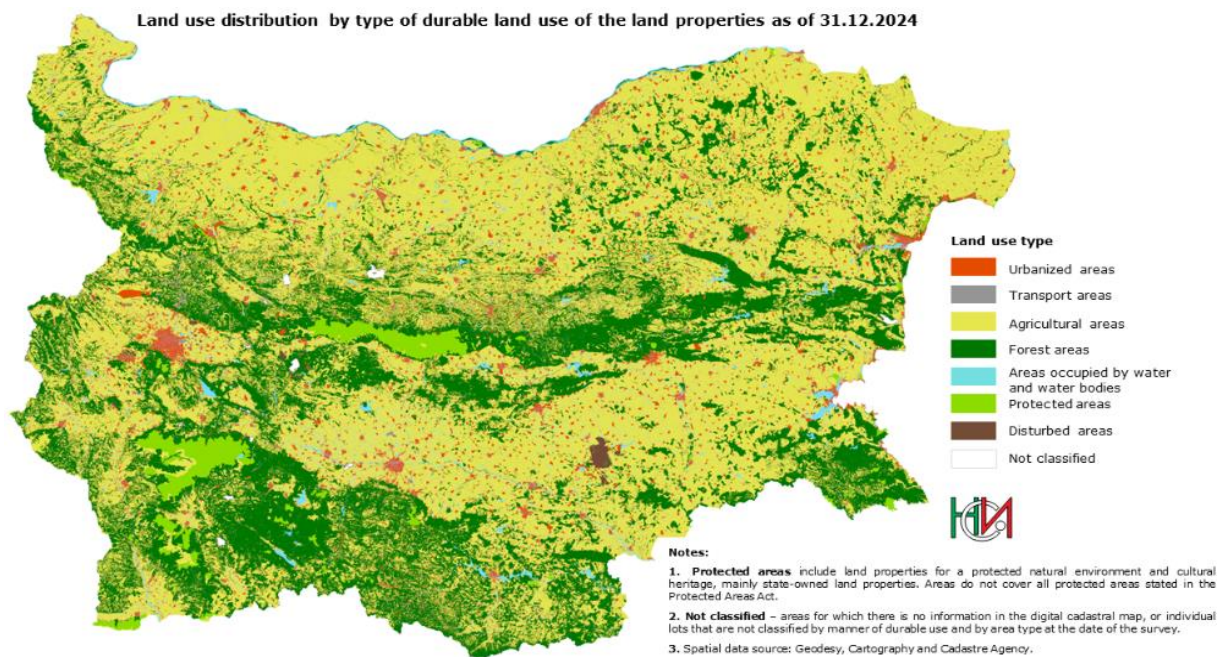


Figure 3. Land use distribution by type of durable land use of the land properties Republic of Bulgaria
Source: National Statistical Institute Republic of Bulgaria

European programmes and implemented ecological measures in Bulgaria

The ecological transformation of Bulgaria's rural regions is largely driven by a set of major European Union programmes, policy frameworks, and financing instruments that underpin national and local environmental strategies. These mechanisms collectively support habitat conservation, restoration of degraded ecosystems, the adoption of sustainable agricultural techniques, and improvements in environmental governance structures.

The practical implementation of these programmes has led to measurable ecological improvements across numerous rural municipalities. Habitat restoration activities, funded primarily through LIFE and EAFRD, have contributed to the revitalization of grasslands, wetlands, and forest ecosystems, while targeted measures under the CAP have promoted sustainable crop rotations, reduced pesticide dependency, and improved soil fertility. These actions align with the objectives of the EU Biodiversity Strategy and help reinforce the ecological connectivity of Natura 2000 sites across Bulgaria.

At the same time, the integration of European environmental priorities into national policy frameworks has strengthened institutional capacity at multiple administrative levels. Municipalities and regional authorities increasingly adopt nature-based solutions, enhance environmental monitoring practices, and incorporate sustainability criteria into local development planning. Although these interventions vary in scale and effectiveness, they collectively represent a significant step toward a more resilient and environmentally responsible model of rural development in Bulgaria.

One of the most influential components in this system is the Natura 2000 ecological network, which encompasses a substantial share of Bulgaria’s countryside. Through EU-supported interventions, the country implements targeted conservation activities aimed at maintaining the integrity of natural habitats, safeguarding rare and threatened species, and enhancing ecological connectivity across

landscapes. In recent years, national authorities have advanced several initiatives that align with EU biodiversity objectives.

These include large-scale ecosystem mapping, assessments of ecosystem services, and the integration of nature-based solutions within protected areas. Such actions help reinforce the ecological resilience of rural landscapes and mitigate environmental pressures including habitat fragmentation, soil degradation, and climate-induced disturbances.

The Common Agricultural Policy (CAP) contributes significantly to rural ecological development by promoting agricultural systems that are compatible with environmental protection and climate adaptation goals. Bulgaria’s CAP Strategic Plan blends compulsory environmental standards with voluntary eco-schemes that incentivize soil conservation, diversified crop rotations, preservation of permanent grasslands, and growth in organic farming.

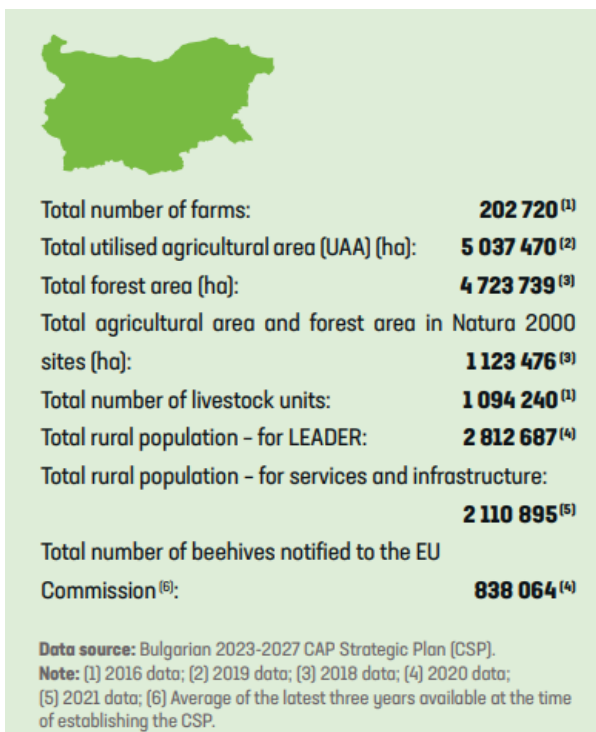


Figure 4. General information. *Source: Bulgarian 2023-2027 CAP Strategic Plan*

As a result, an increasingly larger proportion of agricultural land in Bulgaria is managed under environmentally driven commitments designed to reduce reliance on synthetic inputs, safeguard water quality, and support high-nature-value farming systems. Further progress is achieved through the Operational Programme “Environment,” which channels EU funding into environmental monitoring, strategic conservation planning, and institutional capacity-building.

These projects aim to improve the administrative and technical ability of national bodies responsible for managing the Natura 2000 network. Activities include the preparation of conservation plans, enhancement of surveillance systems, and the implementation of environmental impact assessments.

Public awareness campaigns and participatory initiatives strengthen local involvement, encouraging communities, landowners, and stakeholders to take an active role in ecological protection.

Effectiveness and Observed Outcomes

European Union programmes – most notably the Rural Development Programme (RDP/EAFRD), the LIFE Programme, and the Operational Programme “Environment” – play a decisive role in advancing ecological improvements across Bulgaria’s rural regions.

Through targeted investments and policy incentives, these instruments support biodiversity conservation, rehabilitation and management of natural habitats, enhancements in soil and water quality, and the introduction of environmentally responsible land-use practices at the local level. One of the most visible outcomes of these interventions is the expanding coverage of areas subject to habitat restoration and ecological management.

Projects financed through the LIFE Programme and Natura 2000 initiatives have demonstrated substantial success in safeguarding vulnerable species and priority habitats. In several cases, Bulgarian LIFE projects have earned recognition at the European level for their innovative approaches and measurable ecological benefits. Agri-environmental and climate-related measures under the Rural Development Programme have also produced positive environmental effects. Independent assessments of the 2014–2020 programming period indicate noticeable progress in biodiversity preservation, improved soil stewardship, and more sustainable management of natural resources.

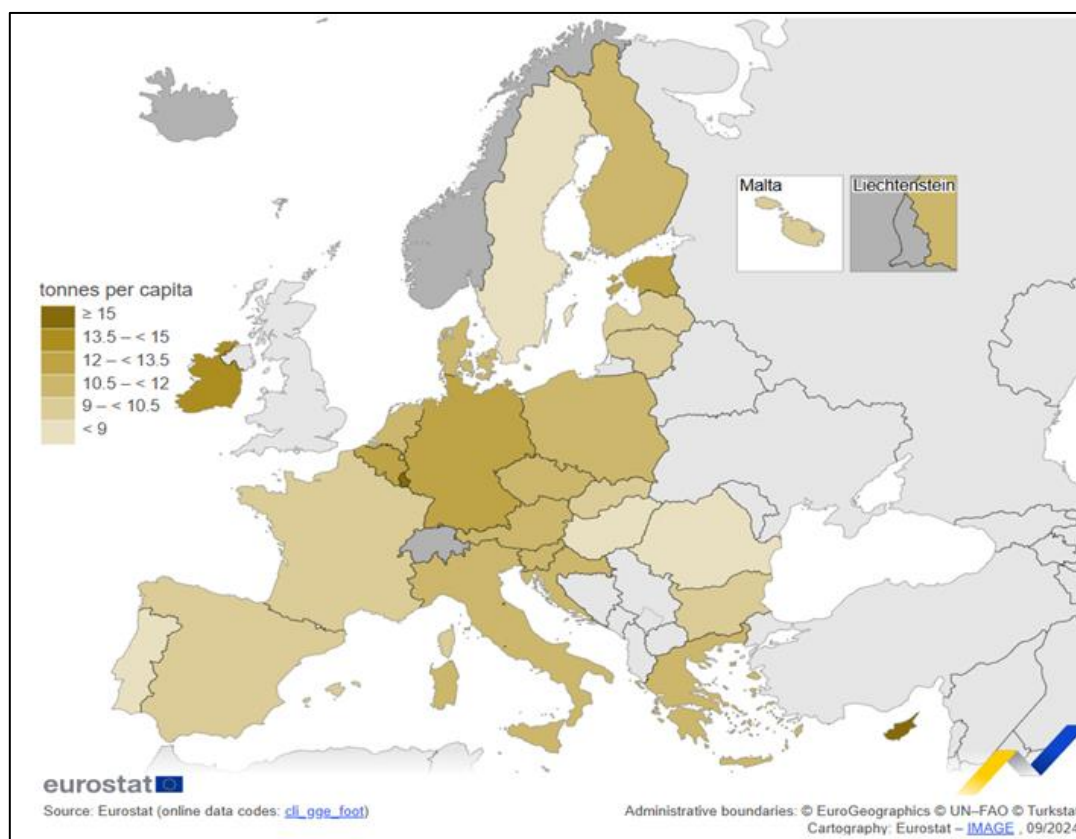


Figure 5. Greenhouse gas footprints (tonnes per capita). *Source: Eurostat*

However, these outcomes show considerable regional variation, with differences linked to local governance capacity, farmer participation, and socio-economic characteristics of rural communities. In case studies of the Blagoevgrad region, Patarchanova (2019) shows how demographic decline, ageing populations and spatial restructuring combine to affect rural stability and local ecological resilience. In parallel, significant improvements have been achieved in water management, waste management, and risk prevention infrastructure, largely due to financial support from the Operational Programme “Environment” and other structural funds.

Despite these advances, the persistence of administrative and technical constraints often limits the scalability of successful ecological measures. Many rural municipalities lack the personnel, expertise, or long-term strategic planning capacity needed to maintain complex environmental projects once EU funding cycles conclude. This creates a dependency on periodic external financing and undermines the continuity of ecological restoration efforts, especially in areas facing acute demographic decline.

Furthermore, the multi-layered structure of EU environmental governance can create coordination challenges between national authorities, local administrations, and private land users. Differences in implementation capacity occasionally lead to fragmented outcomes, where high-performing regions demonstrate substantial ecological progress while others struggle to fulfil even basic environmental obligations.

Addressing these disparities requires more integrated territorial approaches and enhanced support mechanisms tailored to the specific needs of vulnerable rural communities.

These investments have strengthened local resilience by upgrading wastewater treatment, modernizing waste systems, and enhancing preparedness for environmental risks. Despite these positive developments, the territorial impact of EU-funded ecological measures remains uneven. Studies consistently show that the degree to which these programmes succeed is closely tied to administrative competence, awareness among beneficiaries, and the socio-economic context in which local policies are implemented.

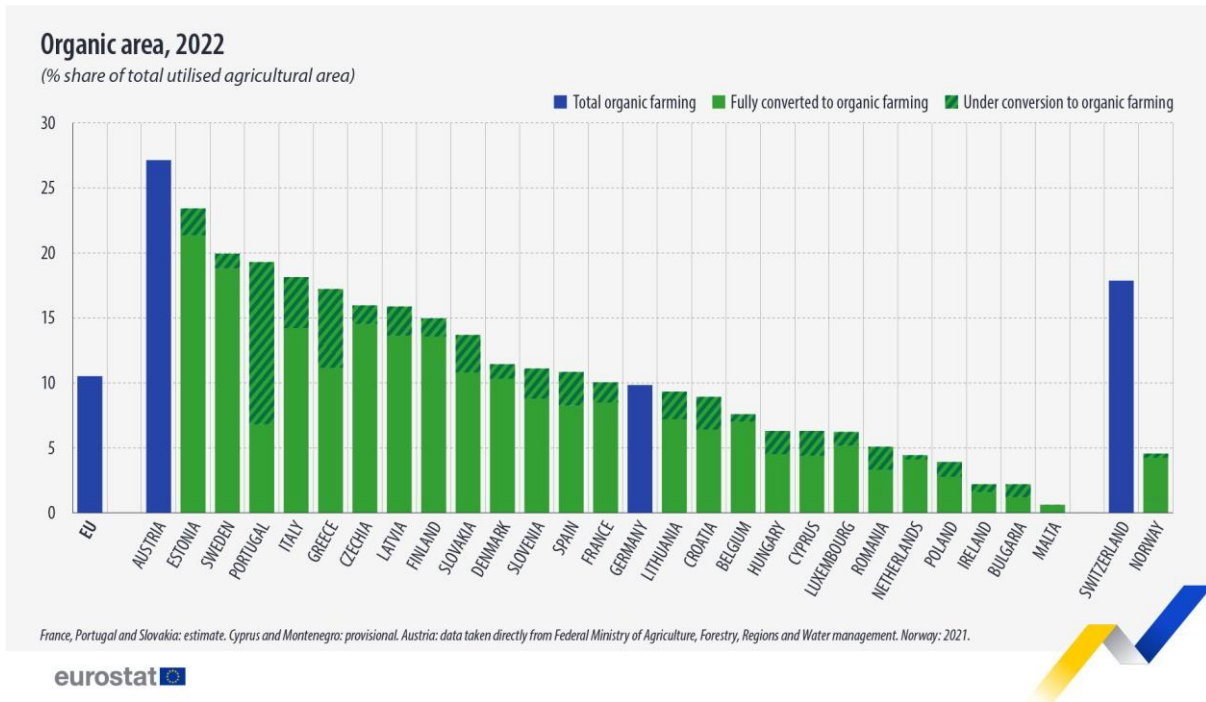


Figure 6. Organic area share of total agricultural land (in %), 2022. Source: Eurostat

Under Bulgaria’s current CAP Strategic Plan, the eco-scheme titled “Preservation and restoration of soil potential” has become one of the most impactful tools. It promotes nutrient management plans, the use of green manure and organic fertilizers, the application of soil-improving materials, and the adoption of low-emission manure application methods.

In 2024 alone, approximately 1.2 million hectares were supported under this scheme – more than double the initially projected area. As a result, around 23% of the country’s agricultural land is now managed through practices that promote sustainable nutrient use and enhanced soil health.

CONCLUSIONS

The assessment of European programmes demonstrates that they remain a fundamental driver of ecological transformation in Bulgaria's rural regions. Their influence extends beyond simple financial support: they shape national environmental priorities, introduce higher ecological standards, and provide the institutional architecture through which sustainable land management becomes feasible. The analysis reveals that the most notable ecological progress is associated with measures targeting biodiversity protection, soil conservation, organic farming, and the restoration of high-nature-value farmlands. Instruments such as the Common Agricultural Policy's eco-schemes, agri-environment-climate measures under EAFRD, LIFE Programme restoration projects, and the Operational Programme "Environment" have collectively contributed to strengthening rural ecological resilience.

However, the study also highlights several structural limitations that continue to constrain the full ecological potential of EU programmes. Administrative complexity remains one of the most significant barriers, particularly for small and medium-sized farms that lack the technical capacity to navigate detailed application, verification, and reporting procedures. Rural municipalities, many of which experience severe depopulation, restricted budgets, and limited human resources, face similar constraints. These systemic challenges contribute to uneven participation in environmental schemes and consequently to territorial disparities in ecological outcomes. Remote, mountainous, and socio-economically disadvantaged regions tend to benefit less, despite their high environmental value.

The findings underscore the urgent need to strengthen local administrative and technical capacity. Establishing regional advisory centres, agricultural extension services, and dedicated environmental project units would significantly increase the ability of local actors to manage EU-supported initiatives. These institutional investments would not only broaden participation but also enhance the long-term sustainability of ecological interventions. Equally important is the simplification of funding procedures. Streamlined application forms, reduced bureaucratic steps, and the possibility for collective applications by farmer cooperatives or community groups would make agri-environmental measures more accessible and effective.

A more integrated, landscape-based approach to ecological management is essential. Coordinated actions across farms, municipalities, and protected areas can produce ecological benefits that exceed the sum of individual efforts, particularly in biodiversity corridors, river basins, and Natura 2000 sites. Strengthening economic incentives – through payments for ecosystem services, support for green entrepreneurship, and market recognition of sustainable agricultural products – can further align environmental goals with rural economic development.

Improved monitoring and evaluation systems are another critical requirement. Establishing a unified national observatory for rural environmental indicators would support evidence-based policy adjustments, ensure more accurate tracking of ecological outcomes, and enhance transparency of public spending. Enhanced data collection on soil carbon, habitat condition, water quality, and land-use dynamics would allow more targeted and adaptive management of EU funds.

In a broader perspective, the long-term ecological effectiveness of European programmes in Bulgaria depends on three interrelated enabling factors:

1. **empowered local governance structures**, capable of planning and implementing environmental measures;
2. **simplified and inclusive funding mechanisms**, lowering administrative barriers for smallholders and vulnerable regions; and
3. **integrated rural development strategies**, linking ecological protection with economic diversification, green jobs, nature-based tourism, and sustainable local value chains.

While EU instruments provide the strategic framework and financial resources, their transformative impact ultimately depends on Bulgaria's ability to integrate environmental, economic, and social priorities at the local level. Strengthening this alignment will allow European programmes not only to protect ecosystems but also to contribute to the long-term viability and vitality of rural communities.



Declaration by Authors

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