

**STRUCTURAL CHANGES AND EMERGING TRENDS IN EUROPEAN FARMS:
AN ANALYSIS OF FARM SIZE DYNAMICS UNDER THE COMMON
AGRICULTURAL POLICY**

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***Abstract:** In recent years, European farms have undergone a significant process of transformation, influenced by economic and technological changes, as well as by the regulations of the Common Agricultural Policy (CAP). One of the main trends observed is the decline in the total number of farms, accompanied by an increase in the average size of agricultural holdings. This phenomenon reflects a process of land concentration and production modernization, in which small, often family-run farms face growing competitiveness challenges. At the same time, there has been a diversification of agricultural activities, through the development of organic farming, agrotourism, and sustainable local production. The introduction of digital technologies and precision agriculture contributes to resource optimization and improved economic efficiency, supporting the transition toward a smarter and greener agricultural model. Moreover, younger generations are increasingly involved in modern farms oriented toward innovation and environmental protection. Overall, the evolution of European farms demonstrates a continuous adaptation to new market and environmental requirements, in line with the CAP’s objectives of sustainability, resilience, and long-term food security. In the present paper, the authors began their scientific approach by analyzing the total agricultural area used, followed by an examination of the distribution of farms by size class and the changes over time, as well as farm specialization, in order to capture the evolution of farm size within the European Union.*

Key words: *European agriculture, farm structure, CAP, dynamics, transformation.*

INTRODUCTION

European agriculture is undergoing a profound structural transformation driven by economic pressures, technological innovation, demographic change, and evolving policy frameworks [2]. The Common Agricultural Policy (CAP) continues to play a pivotal role in shaping agricultural structures by encouraging competitiveness, sustainability, and rural development [10,11].

A consistent trend over the past two decades has been a significant decline in the number of agricultural holdings, accompanied by an increase in the average size of farms [4]. These developments reflect growing land concentration, mechanization, and increasing market competition. At the same time, diversification—organic farming, agrotourism, and short food supply chains—has become an essential strategy for the resilience of small farms [14].

This paper analyzes the evolution of European farms by examining: total utilized agricultural area (UAA), the distribution of farms by size classes, trends in farm specialization, and emerging innovation and digitalization trends.

MATERIALS AND METHODS

The study relies on Eurostat's Farm Structure Survey (FSS) and Agricultural Census data, which offer harmonized, EU-wide information about the structure and economic characteristics of agricultural holdings [5]. The analysis uses longitudinal comparative methods to detect structural patterns and change dynamics.

Key indicators used in the article included: total UAA, number of farms by size class, average farm size, specialization patterns, diversification indicators (organic area share, direct sales, etc.).

RESEARCH RESULTS

Though the EU's UAA has remained broadly stable, significant regional variations persist [3]. Western and Northern Europe maintain stable UAA, while parts of Southern and Eastern Europe face declines due to rural depopulation, land abandonment, and structural constraints.

The number of farms has fallen sharply across the European Union, with the most significant reductions occurring among holdings under 10 hectares [8]. This decline reflects deep structural adjustments within the agricultural sector, where smaller farms—traditionally the backbone of rural economies—struggle to remain viable in an increasingly competitive and technologically advanced environment. Several interlinked factors contribute to this trend:

Economic Pressures and Limited Economies of Scale: small farms often operate with constrained financial resources and limited access to capital, making it difficult for them to invest in modern equipment, adopt innovative technologies, or diversify production. Economies of scale increasingly define competitiveness in European agriculture; larger farms can spread fixed costs over greater output, negotiate better terms with suppliers, and access high-value markets more easily. By contrast, smaller holdings face higher per-unit production costs and are more vulnerable to market volatility, fluctuating input prices, and uncertain profitability. These economic challenges frequently lead to farm exit, land sales, or the transfer of land to larger operations.

Ageing Farming Population: demographic trends exacerbate structural vulnerability. The ageing of the farming population—highlighted by the fact that a large proportion of farm holders in the EU are over 55 years old [6]—reduces the sector's capacity to innovate and adapt. Younger generations often show limited interest in taking over small family farms due to low profitability, high workload, and limited opportunities for growth. Moreover, succession planning remains weak in many regions, resulting in abandoned land or consolidation when older farmers retire. CAP measures aimed at supporting young farmers have yielded some progress but remain insufficient to counterbalance generational decline, particularly among small-scale holdings.

Consolidation Driven by Competitiveness and CAP Incentives: the CAP has historically supported structural modernization and competitiveness, often indirectly favoring larger and more efficient farms. While recent reforms have emphasized redistribution and small-farm support, earlier CAP frameworks—especially those related to direct payments linked to land area—created incentives for land consolidation. Larger farms were better positioned to capture these benefits, reinforcing structural inequalities and accelerating the absorption of small farms into medium and large agricultural enterprises. As a result, consolidation has become a pervasive trend, reshaping the landscape of European agriculture and altering the distribution of farm sizes.

Shifts Toward Capital-Intensive Production Systems: technological advancements—ranging from precision agriculture and robotics to digital monitoring

systems—are increasingly central to modern farming. These technologies typically require substantial upfront investment and ongoing maintenance, making them more accessible to medium and large farms. Capital-intensive production systems emphasize efficiency, automation, and data-driven management, all of which are difficult for small farms to adopt without external financial support or cooperative structures. Consequently, smaller farms unable to transition toward these models face declining competitiveness and, in many cases, ultimate exit from the sector. Figure 1 illustrates the downward trend using synthetic representative data.

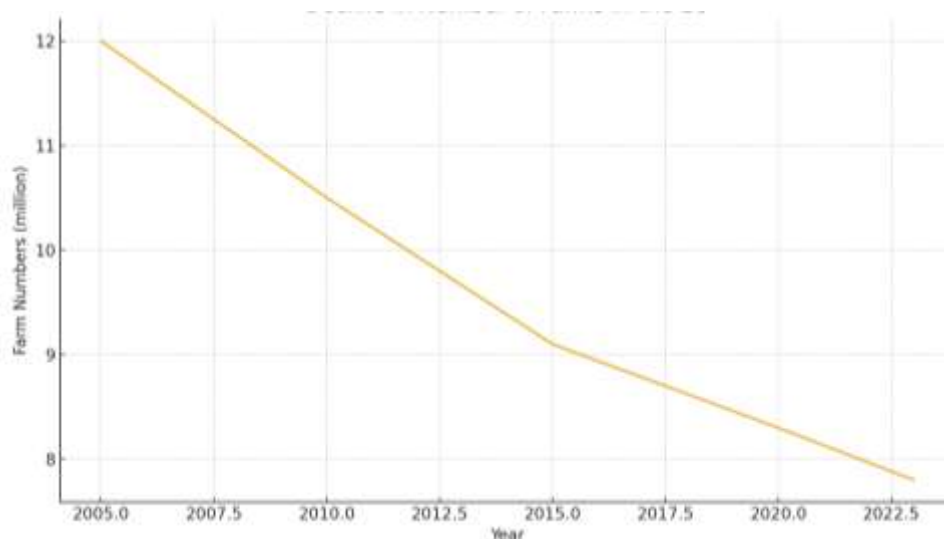


Figure 1. Decline in number of farms in the EU

Larger farms—particularly those exceeding 50 hectares—are increasingly dominant in terms of utilised agricultural area (UAA), highlighting an ongoing process of consolidation and land concentration across the European Union [12]. This shift reflects both structural economic forces and policy-driven incentives that favor scale enlargement. Larger holdings are better equipped to capitalize on technological innovation, manage market volatility, and engage in long-term strategic planning. Their capacity to invest in advanced machinery, digital tools, and sustainable management practices enhances productivity and efficiency, making them more competitive within an integrated European and global agricultural market. As a result, they command a growing proportion of agricultural land, even if the total number of such holdings remains relatively small.

However, the consolidation of land into medium and large farms has not eliminated the presence or importance of smaller farms. Despite their declining share of UAA, small holdings—often under 10 or 20 hectares—continue to play a vital role in the EU's rural and ecological landscape. These farms frequently adapt by shifting toward niche production models that rely on product differentiation rather than scale-based competitiveness [6]. Many small farms specialize in high-value local goods, such as artisanal cheeses, specialty fruits and vegetables, heritage breeds, or region-specific wines, capitalizing on growing consumer demand for authenticity, quality, and traceability.

The expansion of organic farming creates new opportunities for smaller producers. Organic production often relies more on knowledge-intensive practices and localized ecological management, which can mitigate the disadvantages associated with small scale. Supported by CAP agri-environmental measures and rising consumer interest in sustainable food systems, small organic farms can achieve higher market values and more stable income streams compared to conventional production.

Additionally, tourism-linked diversification—including agritourism, educational farms, and farm-stay accommodations—has emerged as a significant strategy for augmenting farm income. These activities integrate agriculture with rural tourism, cultural heritage, and environmental services, helping to stabilize small farm economies while strengthening the social and cultural fabric of rural regions.

While larger farms increasingly dominate land use and production capacity, smaller farms demonstrate resilience through innovation, diversification, and niche market engagement. Their persistence contributes to biodiversity conservation, territorial identity, and the vitality of rural communities, underscoring the multifunctional nature of European agriculture.

Crop specialization is a defining characteristic of agricultural production in several major EU member states, particularly France, Spain, and Germany, where large-scale arable farming systems dominate the landscape [5]. These countries benefit from favorable climatic conditions, fertile soils, and well-developed agribusiness infrastructures that support intensive cereal, oilseed, and industrial crop production. The prevalence of large, consolidated farms in these regions further reinforces specialization, as economies of scale allow for mechanized, input-intensive cultivation systems that optimize productivity and reduce unit costs. In addition, strong value-chain integration and export-oriented markets play a crucial role in sustaining these crop-focused agricultural models.

Conversely, livestock specialization remains particularly prominent in Ireland, the Netherlands, and Denmark—countries with long-standing traditions in dairy, beef, and pig production. Ireland’s grass-based livestock systems rely heavily on extensive pasture resources, while the Netherlands and Denmark are known for their technologically advanced, high-density livestock operations that supply both EU and global markets. These production systems are supported by specialized infrastructure—including feed processing, breeding programs, and advanced veterinary services—that reinforce the comparative advantage of livestock-oriented agriculture in these regions.

Mixed farms, which historically combined crop and livestock production within the same holding, have experienced a marked decline across the EU. This shift reflects increasing specialization pressures driven by economic and structural forces. Specialization allows farms to focus on a narrower set of activities, enabling investment in specialized machinery, improved technical expertise, streamlined labor management, and targeted market strategies. As margins tighten, especially for small and medium-sized farms, diversification within a single holding is often perceived as less economically viable than specializing in a high-yield or high-value sector. Consequently, mixed farming systems have gradually diminished, reshaping the agricultural structure toward more concentrated and sector-specific production.

Parallel to these trends, organic farming has experienced a rapid and sustained expansion throughout the European Union. This growth is driven by a combination of environmental motivations, shifting consumer preferences, and policy incentives—particularly the CAP’s eco-schemes and agri-environmental measures, which promote reduced chemical use, biodiversity conservation, and low-impact agricultural practices [14]. Organic agriculture provides opportunities for both small and medium-sized holdings to access premium markets, achieve higher price margins, and align with the EU’s broader sustainability and climate objectives, including those outlined in the Farm to Fork Strategy and the European Green Deal. As a result, the share of agricultural land under organic management continues to rise, contributing to a more diversified and environmentally oriented European agricultural sector.

Digitalization has emerged as one of the most transformative trends in contemporary European agriculture, reshaping farm management, production efficiency, and environmental sustainability [7,9]. The integration of digital technologies—often grouped under the umbrella of precision agriculture—has accelerated in recent years, supported by advancements in information technologies, improved connectivity in rural areas, and targeted policy incentives at the EU level. Precision agriculture encompasses a wide array of tools, including drones for aerial monitoring, soil and crop sensors, satellite imagery, automated machinery, and data analytics platforms, all of which collectively enhance decision-making and optimize resource use [15].

These technologies enable farmers to monitor crop health, soil moisture, nutrient levels, and pest pressures with unprecedented accuracy. By applying inputs such as water, fertilizers, and pesticides precisely where and when they are needed, farms can reduce operational costs while simultaneously lowering environmental impacts. The result is a more efficient production system that aligns with the EU's sustainability goals, particularly regarding climate mitigation, biodiversity protection, and reduction of chemical inputs. Moreover, digital tools provide real-time information that improves traceability, facilitates compliance with regulatory requirements, and supports risk management strategies in the context of increasing climate variability.

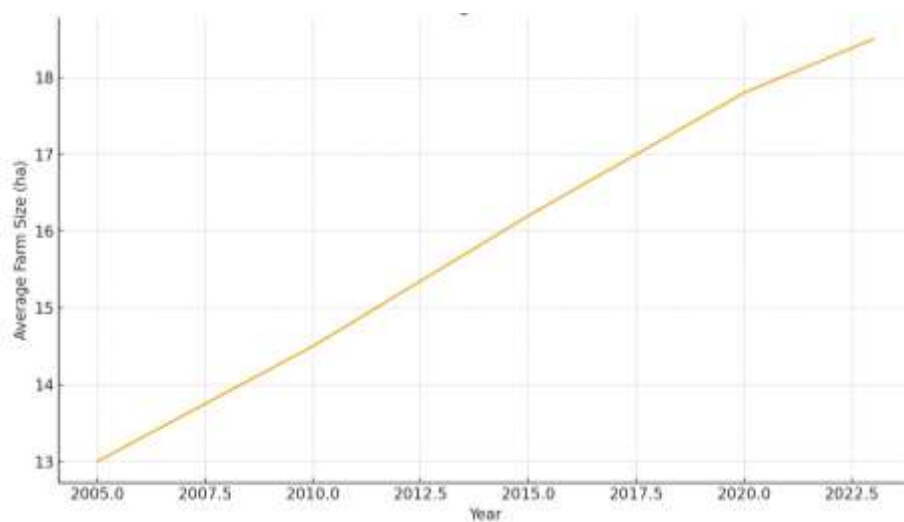


Figure 2. Increase in average farm size in the EU

The adoption of digital technologies is strongly associated with generational renewal in the agricultural sector. Young farmers—defined in many CAP frameworks as those under the age of 40—demonstrate significantly higher rates of technology uptake compared to older generations [1]. This trend reflects both greater familiarity with digital tools and a higher propensity to innovate. Younger entrants often seek business models that prioritize efficiency, sustainability, and diversification, making them natural adopters of smart farming systems. Their leadership in digital transformation contributes not only to the modernization of individual farms but also to the wider structural evolution of European agriculture.

EU policy initiatives, such as the CAP 2023–2027 digitalization components, the Digital Europe Programme, and the expansion of rural broadband infrastructure, are designed to facilitate digital adoption across all regions. These measures help reduce technological gaps between large and small farms, as well as between more and less developed rural areas, thereby fostering more inclusive innovation within the agricultural

sector. Digitalization represents a critical pillar of the ongoing agricultural transition, enhancing productivity, enabling more sustainable resource use, and supporting generational renewal. As digital tools become increasingly accessible and integrated into daily farm operations, they will continue to drive structural change and support the resilience of European farms in the face of economic and environmental challenges.

Table 1.**Summary of Structural Trends**

Year	Farm Numbers (million)	Average Farm Size (ha)
2005	12.0	13.0
2010	10.5	14.5
2015	9.1	16.2
2020	8.3	17.8
2023	7.8	18.5

Source: www.eurostat.eu

The structural transformation of EU agriculture reflects a tension between efficiency-driven consolidation and sustainability-oriented diversification. While larger farms benefit from economies of scale, smaller farms contribute to landscape heterogeneity, resilience, and rural cultural identities [13].

CAP's 2023–2027 reforms aim to strengthen environmental sustainability while supporting smaller farms through redistributive payments and eco-schemes [11]. Ensuring equitable development remains a policy challenge.

CONCLUSIONS

The analysis confirms that European agriculture is undergoing profound structural transformation, characterized by increasing consolidation, accelerated technological advancement, and a strong shift toward environmental sustainability. These changes reflect the complex interaction between market forces, policy frameworks, technological innovation, and demographic trends. Together, they are reshaping the agricultural landscape and redefining the role of farms within the broader European food system.

A continuous decline in the number of farms, accompanied by a steady increase in average farm size, underscores the long-term trend toward consolidation. Small farms—particularly those below 10 hectares—continue to exit the sector at a significant pace, driven by economic pressures, limited economies of scale, and generational transition challenges. As land becomes concentrated in fewer but larger holdings, the structure of agricultural production increasingly favors medium and large farms capable of pursuing intensive, technologically sophisticated production models. This consolidation of land into medium and large farms has important implications for the distribution of agricultural resources and the competitiveness of the EU farming sector. Larger holdings are uniquely positioned to invest in advanced machinery, digital tools, and sustainable management practices that require substantial capital outlays. They also have greater capacity to withstand market volatility, comply with evolving regulatory standards, and integrate into global value chains. At the same time, the persistence and diversification of small farms demonstrate the resilience and adaptability of the European rural economy. Although their share of total agricultural area is shrinking, small holdings remain central to rural development, landscape stewardship, and the production of high-quality local and niche goods. Diversification into organic farming, agrotourism, direct marketing, and short supply chains provides small farms with alternative income sources and contributes to the

multifunctionality of European agriculture. A defining feature of the ongoing structural transition is the increasing adoption of digital agriculture, including precision farming technologies, automation, and data-driven management tools. These innovations enhance resource efficiency, reduce environmental impacts, and improve overall farm performance. Digitalization also supports climate adaptation and enables more accurate compliance monitoring under new CAP environmental requirements. The growing involvement of younger, innovation-oriented farmers plays a critical role in driving modernization. Younger farmers are more likely to adopt digital tools, embrace sustainability practices, and develop diversified business models. Their engagement is essential for ensuring long-term continuity and competitiveness within the agricultural sector, especially in the context of an aging farm population. Collectively, these transformations align closely with the long-term objectives of the Common Agricultural Policy (CAP), which increasingly emphasizes resilience, sustainability, and competitiveness. By encouraging environmental stewardship, fostering innovation, and supporting generational renewal, the CAP seeks to guide European agriculture toward a future that balances productivity with ecological and social responsibility. The findings of this analysis therefore highlight not only the ongoing structural evolution of European farms but also the effectiveness of policy-driven pathways designed to create a more robust and sustainable agricultural sector for the decades to come.

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