*Corresponding Author's Email: dominika.ceryova@uniag.sk
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Selected Indicators of the Agricultural Sector in the European Union

Matej Čereš, Dominika Čeryová*, and Zuzana Kapsdorferová

Institute of Economics and Management, Faculty of Economics and Management, Slovak University of Agriculture in Nitra, Slovakia

Abstract

Agriculture plays a key role in the modern world due to its multifaceted impact. In the last three decades, global, as well as Slovak, agricultural enterprises have undergone significant changes driven by socio-economic transformations, shifts in agricultural policy, institutional reforms, and the adoption of new tools. An analysis of selected indicators of the agricultural sector in the European Union points to significant differences in the structure and performance of agricultural holdings between Member States. In 2020, there were a total of 9.1 million agricultural holdings operating in the EU-27, with the highest shares in Romania (31.8%), Poland (14.4%), Italy (12.5%), and Spain (10.1%). Most of these entities (94.8%) were family farms, though France and Estonia had notable proportions of non-family farms. Almost two-thirds of farms operated on an area of less than 5 ha, while only 7.5% of holdings with an area of 50 ha or more managed 68.2% of the utilised agricultural area (UAA). Slovakia had one of the smallest shares of farms (0.2%) but one of the largest average farm sizes (81 ha) and a high concentration of land in large farms. The grouped Gini coefficient reached approximately 0.81, confirming a high degree of concentration of UAA among agricultural holdings in the EU-27. 3.3 million holdings with standard output below EUR 2,000 produced only 1% of the total standard output, while the 3.3% of the largest farms accounted for more than half of the output. Between 2005 and 2020, the number of farms in the EU-27 decreased by 37%, with the decline mainly affecting small holdings, while total UAA remained broadly stable. These results highlight ongoing consolidation in European agriculture and the growing dominance of large farms. They also underline the need for CAP instruments that balance competitiveness with support for smaller farms, rural resilience, and inclusive structural development.

Keywords: agricultural land, agricultural policy, consolidation, family farms, sustainable agriculture, EU agriculture

1. Introduction

Agriculture plays a key role in the modern world (Dzurová et al., 2021). In the EU, it represents a complex system that, among other aspects, is characterised by a strong

orientation toward supporting farmers' incomes and sustainable development while taking regional specificities into account. In a broader context, the functions of agriculture can be divided into production, economic, environmental, and social functions. The production function highlights the role of agriculture in providing food and raw materials, which form the basis for food security and economic development (Sadjadi & Fernández, 2023). The economic function reflects agriculture's connection to the labour market and other economic sectors, creating broader economic linkages (Babić, 2022). The environmental function is associated with the protection of soil, water, and biodiversity, as well as the implementation of sustainable farming practices (Gotvald, 2024). The social function is linked to maintaining rural communities, cultural traditions, and the quality of life in rural areas (Gudžinskas, 2020). At the same time, the number, size, and distribution of farms represent important indicators for understanding agricultural structure, land use, and the role of small and family farms in food systems (Lowder et al., 2016).

In recent decades, the structure of European agriculture has undergone significant transformation. Structural change in agriculture is commonly associated with a decline in the number of small farms, an increase in average farm size, and the growing importance of larger commercial holdings. These processes are particularly relevant in the EU context, where historical land ownership patterns, market integration, technological change, demographic developments, and agricultural policy jointly influence the development of agricultural holdings. Previous studies on structural change in European agriculture emphasise that consolidation is shaped not only by economic efficiency and economies of scale, but also by institutional transformation, demographic factors, and access to policy support (Buchenrieder et al., 2007; Lerman, 2001; Swain, 2013).

Within the European agricultural system, the Common Agricultural Policy (CAP) plays a key role (Zickiene, 2020; Guth et al., 2020). As a central framework, it sets standards for future agricultural policies (Erjavec et al., 2020) and focuses on effectively strengthening the resilience of the EU agri-food system (Boháčiková & Bencová, 2021). CAP 2023–2027 aims to support competitive, sustainable, and innovative agriculture and the development of rural areas. It is based on ten reformed objectives covering social, environmental, and economic domains. These objectives—competitiveness, fair income, knowledge and innovation, food and health, rural areas, generational renewal, landscape, environment, climate change, and the food and value chain—form the foundation upon which EU Member States have developed their CAP Strategic Plans (European Commission, 2025). The impact of CAP on the structure and performance of agricultural holdings is significant and multifaceted. CAP plays a key role in the modernisation and technological progress of the agricultural sector (Voronkova et al., 2024; Belova et al., 2024). Modernisation through investments in technologies such as robotics, digital tools, and mechanization contributes to increased productivity and efficiency (Ronzhin et al., 2025; Das, 2024; Karunathilake et al., 2023). With the development of technologies such as digital farming applications, crop management improves, helping small farmers address challenges such as climate change (Nemade et al., 2023). However, concerns also arise regarding the inefficient use of subsidies and the redistribution of funds, which may limit the ability of CAP to fulfil its broader objectives (Scown et al., 2020; Pe'er et al., 2020).

In relation to farm structure, CAP instruments may influence both income stability and investment capacity. Direct payments, rural development measures, investment support, eco-schemes, and risk management tools can affect the ability of farms to modernise, expand, or remain economically viable. However, the effects of CAP may differ across farm-size categories and Member States. Larger farms are often better positioned to access investment support, advisory services, and administrative resources, while small and semi-subsistence farms may depend more strongly on direct income support and local rural development measures. Previous research shows that CAP subsidies may affect farm productivity differently depending on farm size, production orientation, and national conditions (Rizov et al., 2013).

The economic significance of agriculture within the EU is extensive. It extends to related industries, creating an important economic network that supports local economies (Koff et al., 2024). These linkages include food processing, input suppliers, trade, logistics, and rural labour markets. Therefore, changes in farm structure have implications not only for agricultural productivity but also for supply chains, rural employment, generational renewal, and regional development.

Types of agricultural holdings can be divided into family and non-family farms. Family farms tend to dominate in most European regions and are known for their focus on sustainable practices and diverse farming methods (Costa-Pereira et al., 2025; Plana-Farran & Gallizo, 2021). Compared to non-family farms, which typically operate as commercial entities with larger investments and market orientation, family farms often prioritise self-sufficiency models and local sales (Batonwero et al., 2022). From an economic perspective, family farms have a distinct impact on local communities and labour markets. They often employ family members, positively influencing rural employment, whereas non-family farms tend to employ external workers and focus on mass production (Williams & Scott, 2024). Small and semi-subsistence farms remain especially important in several Central and Eastern European countries, where they contribute to rural livelihoods but often face limited market integration, lower productivity, and weaker economic performance (Davidova et al., 2009; Hubbard et al., 2014).

At the same time, the coexistence of numerous small farms and a smaller number of large commercial farms creates a dual agricultural structure in several EU Member States. This duality is particularly important when analysing the distribution of utilised agricultural area, standard output, and the long-term consolidation of agricultural holdings.

The specialization of agricultural holdings can be divided into three main types: crop production, livestock production, and mixed farms. Crop production focuses on cultivating crops such as cereals, fruits, and vegetables, playing a key role in ensuring food security and economic stability (Nzima et al., 2024). Efficient technologies and agroecological methods enhance yields and sustainability in crop production, while investments in innovation are essential for its development (Mir et al., 2022). Livestock production focuses on raising animals for meat, milk, and eggs. This sector is closely linked to crop production, as it often utilises by-products from crop cultivation (Paunović & Vučković, 2023). The profitability of livestock production depends on effective management and improved animal welfare.

Sustainable methods, such as agro-livestock systems, can increase resilience to risks and secure higher incomes for farmers (Hashem et al., 2020). Mixed farms combine elements of both production types, enabling synergies and more efficient resource use. This approach helps balance market risks and ensures a more stable income for farmers (Paas et al., 2021). Mixed farms thus represent a flexible model capable of responding better to changes in demand and environmental conditions, thereby contributing to the overall productivity and sustainability of the agricultural system (Nzima et al., 2024).

Farm structure, land concentration, and economic performance are closely connected. A high number of small holdings does not necessarily imply a high share of land use or agricultural output. Conversely, a relatively small group of large farms may control a substantial share of utilised agricultural area and generate a large part of total standard output. Eurostat data show that farms and farmland in the European Union remain unevenly distributed across farm-size categories and Member States, which highlights the importance of analysing structural imbalance in the EU agricultural sector (Eurostat, 2023).

Existing studies often examine individual aspects of EU agriculture, such as CAP support, farm productivity, small farms, or technological change. However, fewer studies combine several dimensions of farm structure within a unified framework, including the distribution of holdings, utilised agricultural area, standard output, farm specialization, land use, and long-term structural change. By incorporating literature on farm structural change, land concentration, CAP support, and productivity, this study provides a broader basis for analysing structural imbalance in the EU-27 agricultural sector.

Based on the theoretical foundations presented above, the main objective of this article is to evaluate selected indicators of the agricultural sector in the European Union. The analysis of the EU-27 agricultural sector in 2020 considers several interrelated dimensions, including the distribution of agricultural holdings, utilised agricultural area, standard output, farm specialization, land use, and structural changes between 2005 and 2020. Particular attention is paid to the concentration of land and output, as these indicators provide important insights into the ongoing consolidation of EU agriculture.

The added value of this study lies in combining Eurostat indicators that are usually presented separately. Unlike descriptive Eurostat syntheses, the article integrates farm numbers, utilised agricultural area, standard output, farm size, land use and specialization into one comparative framework and applies concentration measures to assess structural imbalance in EU agriculture. Compared with previous consolidation studies, which often focus on selected countries, individual dimensions of structural change, or policy effects, this study provides an EU-27 comparative perspective linking land concentration, economic output, farm-size structure, and specialization. The results provide a structured overview of key agricultural indicators and offer insights relevant for research teams, policymakers, and practitioners concerned with the future development of EU agriculture.

2. Methods

The object of the study is the EU-27 Member States, which are analysed based on selected indicators describing the structure, performance, and development of the agricultural sector.

The selection of indicators was based on their ability to capture key characteristics of EU agriculture, particularly the distribution of agricultural holdings, utilised agricultural area, economic performance, farm specialization, and long-term structural change. The analysis focuses primarily on the year 2020, while selected structural changes are evaluated for the period 2005–2020.

The analysis includes the following indicators:

- the share of agricultural holdings in the EU-27 in the total number of holdings in 2020 (in %) (Eurostat: ef_fsi_physz),
- the total number of agricultural holdings in the EU-27 categorised by utilised agricultural area (UAA, in hectares) in 2020 (Eurostat: ef_fsi_physz),
- the distribution of agricultural holdings in the EU-27 by farm size and utilised agricultural area (in %) in 2020 (Eurostat: ef_fsi_physz),
- the standard output in the EU-27 (in EUR) in 2020 (Eurostat: ef_fsi_ecsz; alternatively tag00123 for economic-size categories),
- agricultural holdings in the EU-27 classified by specialization (in %) in 2020 (Eurostat: ef_fsi_ecsz),
- the total agricultural area held by agricultural holdings in the EU-27 by type of land (in hectares) in 2020 (Eurostat: ef_fsi_lus; alternatively tag00007 for farm land use),
- the development of the number of agricultural holdings and utilised agricultural area (UAA, in hectares) in the EU-27 by size categories in the period 2005–2020 (in %) (Eurostat: ef_fsi_physz).

To improve reproducibility, the Eurostat table codes used for the analysed indicators are reported directly in parentheses.

The study is guided by the following research questions:

- What is the structural composition of agricultural holdings in the EU-27 in 2020 in terms of farm size, utilised agricultural area, and distribution of holdings across size categories?
- How is agricultural production distributed across different types of agricultural holdings in the EU-27, considering economic size and specialization?
- How is agricultural land distributed among EU-27 agricultural holdings, and what structural changes in farm numbers and utilised agricultural area occurred between 2005 and 2020?

All data used in the analysis were obtained from the Eurostat database. The study uses harmonised EU-27 data, which ensures comparability across Member States. The data were extracted for indicators related to agricultural holdings, utilised agricultural area, standard output, farm-size categories, farm specialization, land use, and structural changes in the number of holdings and UAA. The year 2020 was selected as the main reference year because it provides the most recent complete structural data available for the analysed indicators, while the period 2005–2020 was used to assess long-term changes in farm structure.

To improve the reproducibility of the analysis, the dataset was documented according to reference years, units of measurement, and applied filters. The extraction procedure focused on EU-27 Member States, the reference year 2020, and the period 2005–2020 for the analysis of structural change.

Utilised agricultural area (UAA) refers to the agricultural area used for farming activities, including arable land, permanent grassland, permanent crops, and kitchen gardens. In this study, utilised agricultural area and related land-use indicators are analysed as areas managed by agricultural holdings, rather than as measures of the total territorial area of individual Member States. Agricultural holdings are classified into farm-size categories according to the amount of UAA they manage. Standard output is used as an indicator of the economic size of agricultural holdings and represents the average monetary value of agricultural production at farm-gate prices, expressed in euros. Farm specialization refers to the dominant type of production activity of agricultural holdings, such as crop production, livestock production, or mixed farming.

Missing or unavailable values were not estimated. The analysis was based only on complete and comparable observations available in the Eurostat database. Percentage shares were calculated from the total number of agricultural holdings, total utilised agricultural area, total agricultural area, or total standard output, depending on the analysed indicator. Minor differences in totals may occur due to rounding of percentage values. Long-term changes between 2005 and 2020 were evaluated using percentage change and comparative trend analysis.

The methodological approach is primarily descriptive and comparative. Descriptive statistics were used to assess the distribution of agricultural holdings, utilised agricultural area, standard output, and farm specialization across EU-27 Member States. Comparative analysis was applied to identify differences between Member States and to highlight structural contrasts between countries dominated by small farms and countries characterised by larger agricultural holdings. In addition, the analysis identifies typological patterns of farm structure, particularly the contrast between countries with a high share of small holdings and countries where a relatively small number of large farms manage a substantial share of utilised agricultural area.

In order to quantify the degree of concentration of utilised agricultural area among agricultural holdings, a grouped Gini coefficient was calculated using Eurostat data on the distribution of farms and utilised agricultural area by farm-size categories. The coefficient was derived from cumulative shares of agricultural holdings and cumulative shares of utilised agricultural area, following the logic of the Lorenz curve approach:

$$G = 1 - \sum_{i=1}^{n} (X_i - X_{i-1})(Y_i + Y_{i-1}) \tag{1}$$

where G denotes the grouped Gini coefficient, X_i represents the cumulative share of agricultural holdings up to the i-th farm-size category, Y_i represents the cumulative share of utilised agricultural area up to the i-th farm-size category, and n is the number of farm-size

categories. The values X_0 and Y_0 are equal to zero. A value closer to 0 indicates a more equal distribution of utilised agricultural area among holdings, while a value closer to 1 indicates a higher level of land concentration.

The calculation was based on grouped Eurostat data rather than individual farm-level observations. Therefore, the resulting Gini coefficient should be interpreted as an approximate measure of land concentration. The main limitation of this approach is that it does not capture variation among individual farms within the same farm-size category.

The data-processing workflow consisted of several steps. First, relevant harmonised Eurostat datasets were identified and extracted for the EU-27 Member States, with 2020 used as the main reference year and the period 2005–2020 used for the analysis of structural change. The selected datasets covered agricultural holdings, utilised agricultural area (UAA), farm-size categories, economic-size categories, standard output, farm specialization, land use, and changes in the number of holdings and UAA over time. Second, the data were filtered by territorial unit, reference year, unit of measurement, and relevant classification category, including farm-size category, economic-size category, farm type, and land-use category. Third, absolute values were converted into percentage shares using the relevant EU-27 totals. Fourth, farm-size categories were ordered from the smallest to the largest according to utilised agricultural area, and cumulative shares of agricultural holdings and UAA were calculated. These cumulative shares were used for the calculation of the grouped Gini coefficient according to the formula presented above. Finally, the results were compared across selected farm-size thresholds and economic-size categories to assess whether the interpretation of land and output concentration remained consistent across alternative indicators.

No missing or unavailable values were imputed. The analysis was based only on complete and comparable observations available in the Eurostat database. Minor differences in totals may occur due to rounding of percentage values.

To strengthen the robustness of the findings, the grouped Gini coefficient was complemented by alternative threshold-based concentration indicators. This approach was selected because the study is based on aggregated Eurostat farm-size categories rather than individual farm-level observations. Threshold-based indicators make it possible to verify whether the interpretation of land concentration remains consistent when different farm-size cut-off points are applied.

The concentration ratio was calculated as follows:

$$CR_{\geq k} = (UAA_{\geq k} / UAA_{total}) \times 100 \quad (2)$$

where $CR_{\geq k}$ denotes the concentration ratio for farms with utilised agricultural area equal to or above the threshold k, $UAA_{\geq k}$ represents the utilised agricultural area managed by holdings in farm-size categories equal to or above this threshold, and UAA_total represents the total utilised agricultural area managed by all agricultural holdings.

In this study, two thresholds were applied: holdings with 50 hectares or more and holdings with 100 hectares or more. These indicators were used to assess whether the interpretation of land concentration remained consistent across alternative farm-size thresholds. Threshold-based concentration indicators provide a transparent and directly interpretable robustness check that is consistent with the descriptive and comparative nature of the study. Since they are based on grouped Eurostat categories, they should be interpreted as supplementary indicators of concentration rather than as farm-level measures.

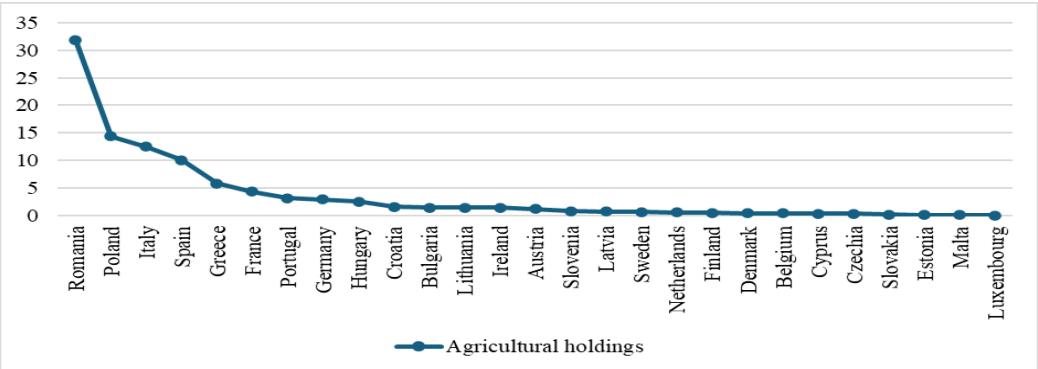
The distribution of standard output was analysed through concentration ratios based on economic-size categories of agricultural holdings. This approach makes it possible to assess whether economic production is similarly concentrated among a relatively small number of large farms. The comparison between land concentration and output concentration provides a broader view of structural imbalance in the EU-27 agricultural sector.

Although the study is mainly descriptive, the calculation of the grouped Gini coefficient and the use of concentration indicators provide additional analytical rigor. Existing studies often focus on individual aspects of EU agriculture; therefore, this study addresses this gap by combining multiple dimensions of agricultural structure and performance within a unified analytical framework. The analysis does not aim to establish causal relationships between policy measures and structural change. Instead, it provides comparative and analytical evidence on the distribution of land, holdings, and agricultural output across the EU-27.

3. Results

In 2020, there were 9.1 million agricultural holdings in the EU-27, of which 2.9 million (31.8%) were in Romania, representing more than twice the number of agricultural holdings compared to other EU-27 Member States. Poland had 1.3 million agricultural holdings (14.4%), followed by Italy with 1.1 million (12.5%) and Spain with 0.9 million (10.1%). Slovakia recorded the fourth lowest share of agricultural holdings in the total number of holdings in the EU-27, with only 19 thousand (0.2%), which is the lowest among all V4 countries. Most agricultural holdings in the EU-27 (94.8%) were classified as family farms, defined as agricultural holdings where 50% or more of the regular workforce is provided by family members. Family farms were the dominant type of agricultural holdings in all EU-27 Member States (Figure 1).

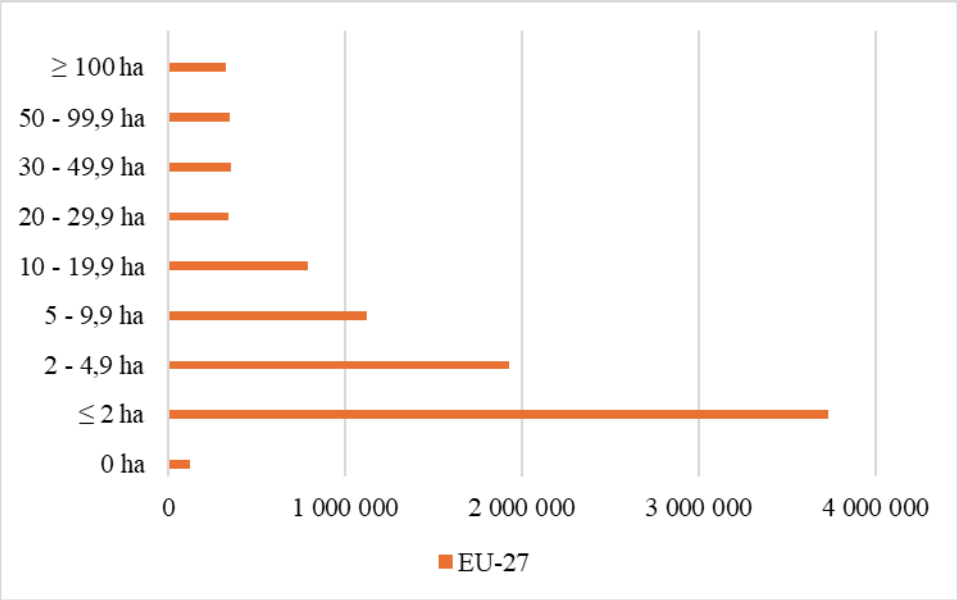
Figure 1: Share of agricultural holdings in the EU-27 in the total number of holdings in % (2020)



Source: own processing according to Eurostat, 2023

Almost two-thirds of agricultural holdings in the EU-27 in 2020 operated on less than 5 hectares of land. These holdings played an important role in reducing the risk of poverty in rural areas by providing sufficient income and food. At the opposite end of the scale, 7.5% of agricultural holdings had 50 hectares or more, yet they managed 68.2% of the utilised agricultural area (UAA) of the EU-27. The average farm size in the EU-27 was 17.4 hectares. In Slovakia, the farm structure was similarly polarised, with one of the lowest shares of small farms (below 2 hectares) and an exceptionally high average farm size of 81 hectares, reflecting a strong concentration of land in larger agricultural holdings (Figure 2).

Figure 2: Total number of agricultural holdings in the EU-27 categorised by utilised agricultural area in hectares (2020)



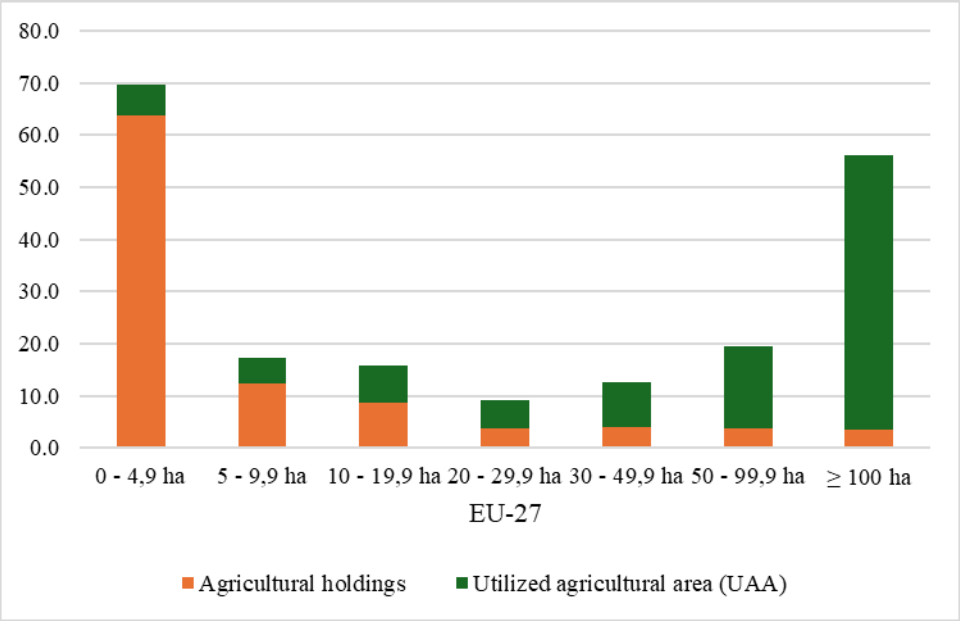
Source: own processing according to Eurostat, 2023

Romania is the Member State with the highest number of agricultural holdings. Nine out of every ten agricultural holdings (90.3%, or 2.6 million holdings) operated on less than 5 hectares of utilised agricultural area, while only 0.9% of holdings with 50 hectares or more managed slightly more than half (54%) of the utilised agricultural area. Small agricultural holdings with less than 5 hectares of land were also characteristic of Malta (96.6% of all holdings), Cyprus (87.5%), Greece (74%), Portugal (73.4%), Croatia (70.6%), Hungary (64.9%), and Bulgaria (64%), reflecting a specialization in crops such as small olive groves, vineyards and similar. Larger agricultural holdings operating 50 hectares or more were much more common in Luxembourg (52.7%), France (46.0%), Finland (33.3%), Germany (31.5%), and Denmark (30.9%). In Slovakia, 2,490 agricultural holdings (12% of the total) with 100 hectares or more managed 1.65 million hectares of utilised agricultural area, highlighting a strong concentration of land in a relatively small number of farms—one of the highest shares in the EU-27. Conversely, almost 40% of agricultural holdings operated only 7% of the utilised agricultural area, representing a considerably below-average share compared to the EU-27 (Figure 3).

The comparison of Member States also reveals distinct typological patterns of farm structure. A first group consists of small-farm dominated countries, where a high proportion of

agricultural holdings operate on less than 5 hectares of UAA. This pattern is particularly visible in Romania, Malta, Cyprus, Greece, Portugal, Croatia, Hungary and Bulgaria. A second group includes countries with more consolidated farm structures, where larger farms represent a higher share of agricultural holdings or manage a substantial proportion of UAA, such as Luxembourg, France, Finland, Germany, Denmark and Slovakia. Other Member States show more mixed or intermediate structural profiles, combining small and medium-sized holdings with regionally important larger farms. This typological comparison highlights that structural concentration in EU agriculture is not uniform across Member States, but reflects different historical, institutional and production-related conditions.

Figure 3: Distribution of agricultural holdings and utilised agricultural area in the EU-27 by farm-size category in % (2020)



Source: own processing according to Eurostat, 2023

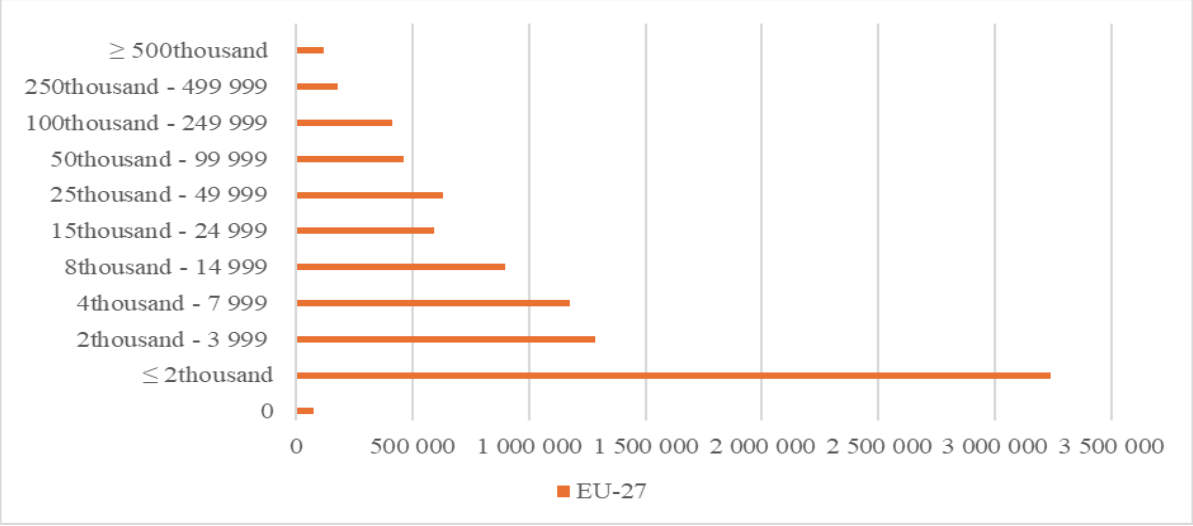
Based on the distribution of agricultural holdings and utilised agricultural area by farm-size categories, a grouped Gini coefficient was calculated for the EU-27. The estimated value reached approximately 0.81, indicating a high level of concentration of utilised agricultural area among agricultural holdings. This confirms that agricultural land in the EU-27 is distributed unevenly, with a relatively small share of large farms controlling a substantial proportion of total utilised agricultural area. However, since the calculation is based on grouped data, the coefficient should be interpreted as an approximate indicator of land concentration rather than an exact farm-level Gini coefficient. The main source of uncertainty is the use of grouped data, which does not capture variation among individual farms within each size category.

The robustness checks based on threshold concentration indicators confirm the interpretation of high land concentration in the EU-27. Holdings with 50 hectares or more represented only 7.5% of all agricultural holdings, yet they managed 68.2% of the utilised agricultural area. Similarly, holdings with 100 hectares or more managed 52.5% of the utilised agricultural area. These results support the grouped Gini coefficient and show that the conclusion

regarding high land concentration is not dependent on a single concentration measure. Instead, the evidence remains consistent across alternative farm-size thresholds. Although both the grouped Gini coefficient and the threshold-based indicators are based on grouped Eurostat data, the results clearly indicate that a relatively small proportion of larger farms manages the majority of utilised agricultural area in the EU-27.

Differences in the structure of agricultural holdings in terms of size and utilised agricultural area (UAA) are more evident when analysing holdings based on their economic performance. Out of 9.1 million holdings in the EU-27, 3.3 million had a standard output of less than EUR 2,000 per year and were responsible for only 1% of total production. These, predominantly small farms, were at the semi-subsistence end of the scale. Approximately two-thirds of such farms in the EU-27 consumed more than half of their own production. Another 2.5 million agricultural holdings had a standard output ranging from EUR 2,000 to EUR 8,000 per year. Together, these holdings accounted for two-thirds (63.7%) of all farms in the EU-27 in 2020. In contrast, 299,000 holdings (3.3% of the total), each producing EUR 250,000 or more in standard output per year, were responsible for the majority (56.4%) of the total agricultural production in the EU-27. These holdings were primarily characterised as large agricultural enterprises. In 2020, Slovakia accounted for only 0.5% of the EU-27's total standard output, placing it 24th among member states, while the majority of production (60.2%) came from mixed farms in Italy (18.1%), France (17.2%), Germany (12.6%), and Spain (12.2%), and although Romania had about one-third of all EU-27 farms, it contributed only 3.3% of total production (Figure 4).

Figure 4: Standard output of agricultural holdings in the EU-27 in EUR (2020)



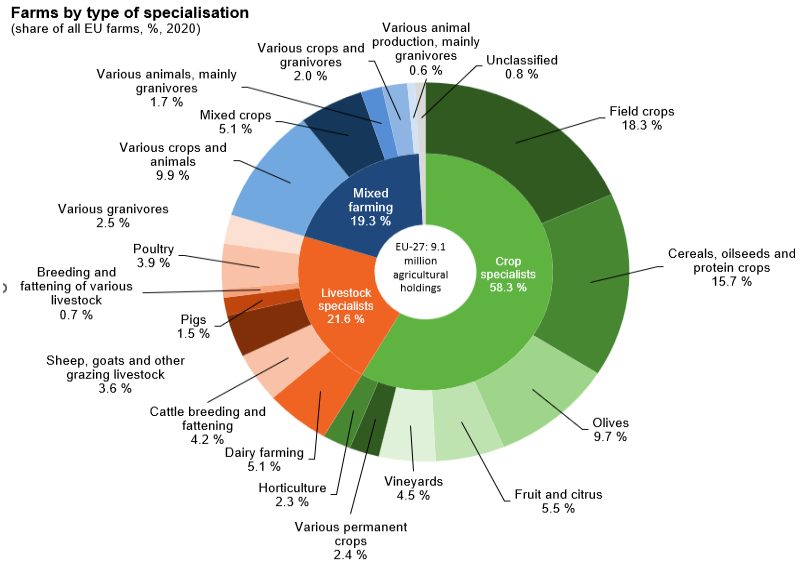
Source: own processing according to Eurostat, 2023

The distribution of standard output also reveals a high level of economic concentration. While 3.3 million holdings with standard output below EUR 2,000 per year accounted for only 1% of total standard output, 299,000 holdings, representing 3.3% of all agricultural holdings, generated 56.4% of total agricultural production. This indicates that structural concentration in the EU-27 agricultural sector is not limited to land use, but is also reflected in economic performance. Large agricultural holdings therefore play a dominant role not only

in the management of utilised agricultural area, but also in the generation of agricultural output.

Almost 6 out of 10 agricultural holdings in the EU-27 (58.3%) were specialized in crop production in 2020. Within this specialization group, farms focused on field crops were the most numerous (18.3% of all farms in the EU-27), followed by holdings specialized in cereals, oilseeds, and protein crops (15.7% of all farms). A total of 21.6% of agricultural holdings in the EU-27 were specialized in livestock production, with dairy farms (5.1% of all farms) and farms specialized in cattle breeding and fattening (4.2%) being the most common within this group. Mixed – combined farms accounted for 19.3% of agricultural holdings in the EU-27, while only a small percentage of farms could not be precisely classified. In Slovakia, 55.3% of agricultural holdings were specialized in crop production, 30.6% in livestock production (a share exceeding the EU-27 average), and 13.8% were mixed farms (Figure 5).

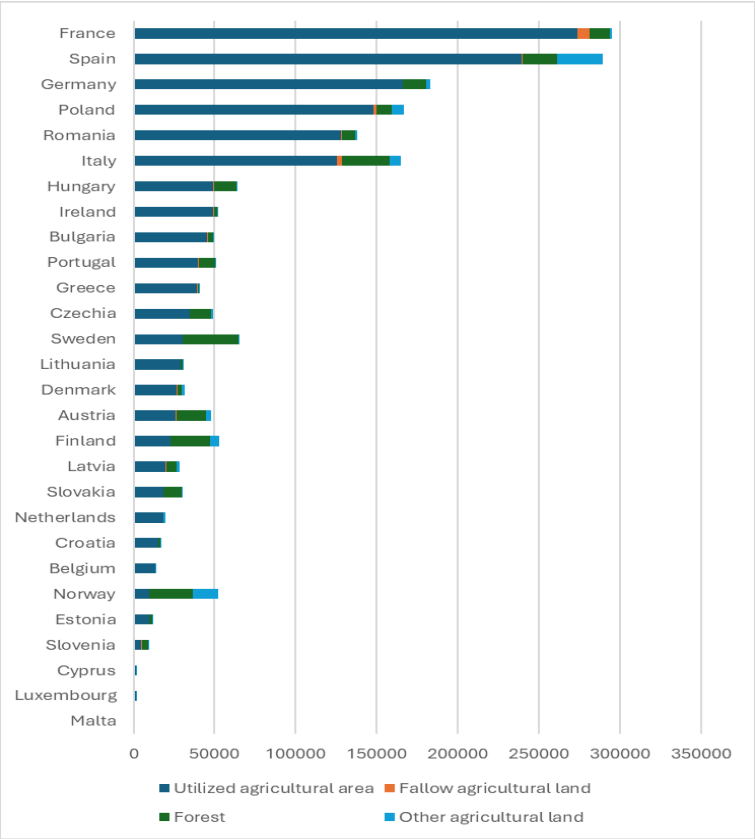
Figure 5: Agricultural holdings in the EU-27 classified by specialization in % (2020)



Source: own processing according to Eurostat, 2023

Agricultural holdings in the EU-27 managed 38.4% of the total agricultural area, 5.9% of forest land, and 2.2% of other agricultural land. The largest share of agricultural area (utilised agricultural area) was managed by countries such as France (15%), Spain (14.8%), Germany (9.4%), and Poland (8.5%). In 2020, agricultural holdings in Slovakia managed 1.54% of the EU-27's total agricultural area, of which 62% was utilised agricultural area, 37% forest land, and the remaining share consisted of other and non-utilised land (Figure 6).

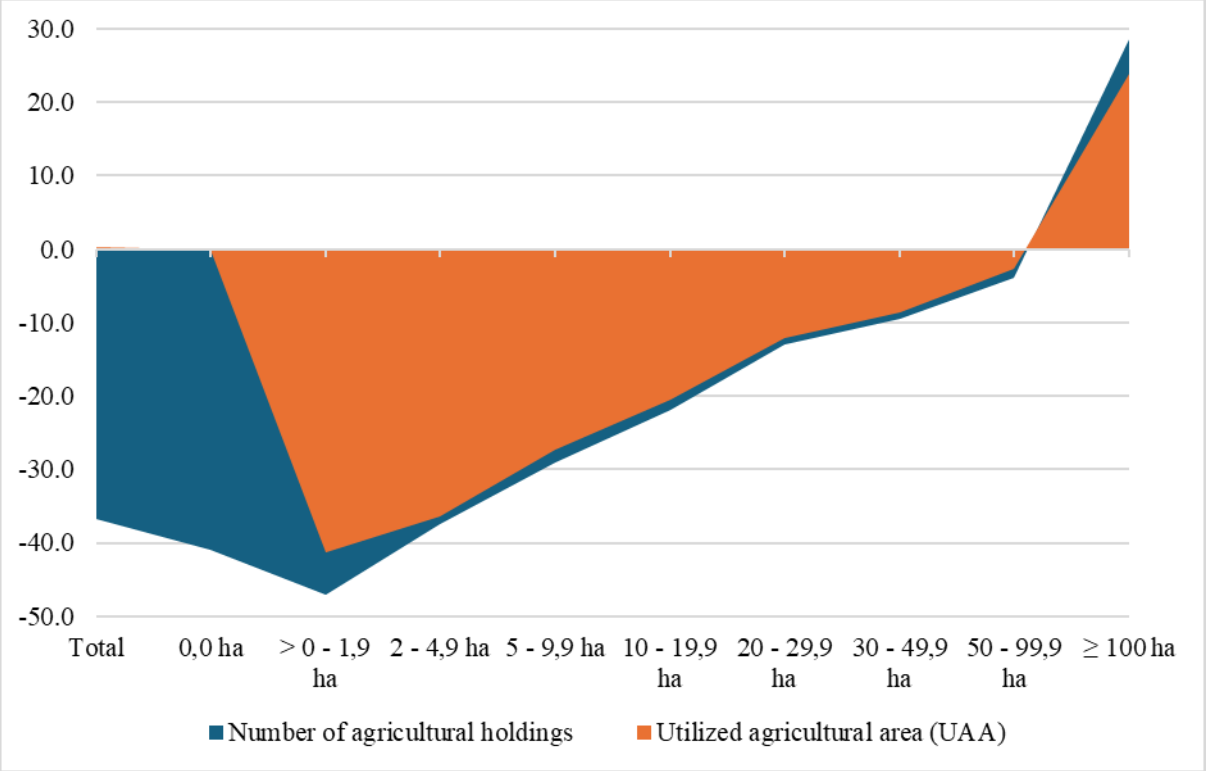
Figure 6: Total agricultural area held by agricultural holdings in the EU-27 by type of land in hectares (2020)



Source: own processing according to Eurostat, 2023

The number of agricultural holdings in the EU-27 has been declining in the long term. Taking this into account, the number of agricultural holdings in the EU-27 decreased by approximately 37% over the relatively short period between 2005 and 2020. This corresponded to a loss of 5.3 million holdings in the Member States, the vast majority of which—around 87%—were small farms with less than 5 hectares of land. The largest decreases in the number of agricultural holdings were recorded in Romania (an indicative loss of 1.4 million small farms, corresponding to a decline of 32%), Poland (an indicative loss of 1.2 million small farms, or –47%), Italy (an indicative loss of 0.6 million farms, or –34%), Hungary (an indicative loss of 0.5 million farms, or –68%), Bulgaria (an indicative loss of 0.4 million farms, or –75%), and Greece (an indicative loss of 0.3 million farms, or –36%). The agricultural area used for farming remained essentially unchanged between 2005 and 2020 (+0.3%), despite the sharp decline in the number of agricultural holdings. At the EU-27 level, this consolidation of agricultural land reflected an increase in the number of large agricultural holdings and in land used by these holdings for agricultural purposes. For example, in Bulgaria, there was an increase in the number of agricultural holdings managing more than 5 hectares of land, despite an overall loss of almost 400 thousand farms in the country. In Slovakia, the number of small farms with less than 2 hectares of land decreased dramatically between 2005 and 2020, falling from 53.8 thousand to fewer than 2.7 thousand (–95%) (Figure 7).

Figure 7: Change in the number of agricultural holdings and utilised agricultural area in the EU-27 by farm-size category in % (2005–2020)



Source: own processing according to Eurostat, 2023

4. Conclusion

The analysis of selected indicators of the agricultural sector in the EU-27 confirms significant structural differences between Member States and highlights a clear trend towards consolidation. While the number of farms fell sharply between 2005 and 2020 – due to a decline among small holdings – the total agricultural area remained stable, indicating an increasing concentration of land in larger farms. This addresses the first research question, confirming that the EU-27 agricultural structure is highly heterogeneous, with a strong dominance of small farms in terms of numbers but large farms in terms of land use. This finding is further supported by the grouped Gini coefficient of approximately 0.81, which confirms a high degree of concentration of utilised agricultural area among agricultural holdings in the EU-27. This structural imbalance is also reflected in the distribution of agricultural production, thereby answering the second research question. A relatively small share of large and economically strong farms generates the majority of agricultural output, while a large proportion of small holdings contributes only marginally to total production. Although Romania, Poland, Italy and Spain account for the majority of agricultural holdings, their contribution to production is relatively low compared to countries with more consolidated farm structures. This confirms that concentration in EU agriculture is not limited to land use, but is also visible in the economic performance of agricultural holdings. In the case of countries such as Romania and Bulgaria, the share of farms smaller than 10 ha is significantly higher than the EU-27 average, supporting the findings of Božić and Munćan (2015) on regional diversity and the predominance of small family farms. Finally, the third

research question is addressed through the observed long-term structural changes in farm numbers and utilised agricultural area between 2005 and 2020. The results confirm a strong process of consolidation, with a substantial decline in small farms and a simultaneous increase in the relative importance of larger agricultural holdings, while total utilised agricultural area remained largely stable. This indicates that agricultural land is increasingly concentrated among fewer, larger farms, particularly in Central and Eastern European countries. The observed consolidation can be explained by several mutually reinforcing mechanisms, including technological progress, economies of scale, access to capital and investment support, demographic ageing of farm managers, and limited generational renewal in rural areas. Larger farms are generally better positioned to adopt modern technologies, spread fixed costs over a larger land base, and participate in more demanding supply chains. At the same time, small and semi-subsistence farms often face weaker access to finance, labour shortages, and succession problems, which may contribute to their gradual decline. This is also related to Cartwright (2017) and Andrei et al. (2023), who point to the high prevalence of small and low-performing farms managed by older farmers in Romania. A small share of the largest farms generates the majority of agricultural production, which highlights differences in productivity and economic performance. This is consistent with the findings of studies in Greece (Koutouzidou et al., 2022) and Bulgaria (Kostadinova, 2017), where CAP-supported farm intensification and consolidation leads to higher efficiency but also puts pressure on small farms. Similar findings are reported in the case of Slovakia and the Czech Republic, where CAP subsidies have improved farm incomes, while most small farms would have generated losses without subsidies (Chrastinová & Burianová, 2009; Střeleček et al., 2009). However, the results should be interpreted with caution. The analysis identifies strong structural associations between farm size, land concentration, and economic performance, but it does not establish direct causal relationships. The consolidation process may be influenced by several interrelated factors, including CAP design, national land structures, market access, technological capacity, demographic change, and institutional conditions. Therefore, CAP should be understood as one of the factors shaping farm structure rather than as the sole cause of consolidation. These findings highlight the need to further adapt the Common Agricultural Policy to regional conditions, promote sustainable farm structures, and strengthen the resilience and competitiveness of the EU agricultural sector. The position of Member States at the EU level is strongly influenced by the structure of their agriculture, including farm size, the degree of market liberalisation, and dependence on subsidies. It also shows that semi-subsistence farms remain dominant even after the accession of Central and Eastern European countries to the EU (Hubbard et al., 2014; Swain, 2013). The results of the studies by Andrei et al. (2023) confirm the high polarization of the agricultural structure in Romania – next to large professional farms, there is also a large number of small and low-performing family farms, which corresponds to our findings on the concentration of production in larger farms. From a policy perspective, these results suggest that future CAP design should better balance competitiveness objectives with the need to support smaller and medium-sized farms. Relevant policy levers include better targeting of redistributive payments, accessible eco-schemes for smaller holdings, investment support for technological modernisation, risk management tools, and measures supporting generational renewal. From a managerial and supply-chain perspective, the growing role of large farms

may increase efficiency and market integration, but it may also deepen the vulnerability of rural areas where small farms contribute to employment, landscape management, and local food systems. Managerial implications follow from the dual structure of EU agriculture. For small and semi-subsistence farms, the high concentration of utilised agricultural area and standard output among larger holdings indicates a weaker position in supply chains, lower bargaining power, and limited ability to meet the volume, quality, and continuity requirements of processors and retailers. Small and medium-sized farms may therefore improve their position through producer organisations, cooperatives, short supply chains, local branding, collective purchasing of inputs, shared machinery services, joint marketing initiatives, and contractual arrangements that reduce market and price uncertainty. Such cooperation can improve their access to supply chains, reduce transaction costs, and strengthen their ability to participate in more stable contractual relationships. For larger farms, the results indicate stronger market integration and a greater capacity to participate in formal supply chains and long-term contracts with processors, wholesalers, and retailers. However, their dependence on larger volumes, specialized production, and market-oriented strategies also increases exposure to price volatility, input-cost shocks, climate risks, and changes in policy support. Large farms should therefore focus on contract diversification, risk-sharing arrangements with processors and buyers, forward contracts, insurance instruments, liquidity reserves, investment in precision technologies, diversification of sales channels, and improved financial and production planning. For farm managers, the results suggest that competitiveness should not be understood only as farm expansion, but also as better coordination, stronger bargaining power, improved financial planning, and differentiated risk-management strategies according to farm size. Risk management should therefore combine farm-level strategies with institutional support. For small farms, accessible advisory services, simplified administrative procedures, and targeted CAP measures are particularly important, while for large farms, risk management should focus on technological innovation, market diversification, environmental compliance, and long-term investment planning. The main limitation of the study is the use of aggregated Eurostat data, which does not fully capture heterogeneity within individual Member States or within farm-size categories. The grouped Gini coefficient should therefore be interpreted as an approximate measure of land concentration rather than an exact farm-level indicator. Despite these limitations, the results provide clear evidence of structural imbalance in EU agriculture and underline the need to consider both efficiency and inclusiveness in future agricultural policy.

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