

Article

The Structural Evolution of the Agricultural Services Market in Poland

Wioleta Sobczak-Malitka ¹ and Nina Drejerska ^{2,*}

¹ Institute of Economics and Finance, Warsaw University of Life Sciences—SGGW, Nowoursynowska str. 166, 02-787 Warsaw, Poland; wioleta_sobczak@sggw.edu.pl

² Centre for Climate Research, Warsaw University of Life Sciences—SGGW, Nowoursynowska str. 166, 02-787 Warsaw, Poland

* Correspondence: nina_drejerska@sggw.edu.pl

Abstract

Agricultural services are an important component of the agricultural production system, as they may support farms in accessing machinery, labour, specialised knowledge, and selected technical inputs without fully internalising these resources. Despite their relevance, empirical evidence on the development of agricultural services remains limited in the Polish and broader Central and Eastern European context. The objective of this article is to assess the structural evolution of the agricultural and horticultural services market in Poland, with particular attention to the number and regional distribution of service providers, firm-size structure, farm-level use of selected services, and changes in service costs. The study is based on official statistical data from the Central Statistical Office of Poland for 2009–2024 and two survey waves conducted among farms in the Mazowieckie region in 2013 and 2024. The methodological approach combines descriptive and comparative analyses with exploratory logistic regression models. The results show that the agricultural services market in Poland has undergone clear structural changes, although the dynamics differed across service segments. Services supporting crop production expanded until 2015 and then stabilised or slightly declined, while post-harvest and live-stock-related services remained relatively stable. Landscaping services recorded continuous growth, especially after 2019. The market is strongly dominated by micro-enterprises. Survey results indicate changes in the declared use, structure, and costs of selected services. However, they should be treated as supplementary regional evidence rather than a basis for causal conclusions about rural development outcomes.

Keywords: agricultural services; rural development; agricultural competitiveness; agricultural modernisation; sustainable development

Academic Editor: Jacob Arie Jordaan

Received: 6 April 2026

Revised: 2 July 2026

Accepted: 4 July 2026

Published: 8 July 2026

Copyright: © 2026 by the authors.

Licensee MDPI, Basel, Switzerland.

This article is an open access article distributed under the terms and conditions of the [Creative Commons Attribution \(CC BY\)](https://creativecommons.org/licenses/by/4.0/) license.

1. Introduction

One of the most important issues facing the world in the 21st century is food security. It is becoming an increasingly important concern for both agriculture and policy-makers. In an era of market globalisation and production intensification aimed at ensuring access to safe food for all, it is also important to maintain a balance between production efficiency and sustainable agricultural practices. Therefore, it is important to conduct agricultural production in accordance with the principles of sustainable agriculture, which increase the economic well-being of agricultural entities by ensuring stable agricultural production

and rational land use, while ensuring food security and synergy between agriculture and the environment, where sustainable environmental management and agricultural production are achieved simultaneously [1]. Improving agricultural productivity and ensuring food security are key to meeting the challenges posed by the transformation of global agricultural development and growing market demand. Increasing production efficiency is crucial for the development of modern agriculture [2]. In this context, agricultural services are becoming an increasingly important element of the agricultural production system. They allow farms to access machinery, which is particularly relevant where farms are too small or financially constrained to invest in specialised equipment and technologies independently.

The remainder of the paper is structured as follows. Section 2 reviews the literature on agricultural services and identifies the research gap that guides the empirical analysis. Then, the materials and methods are presented, including the secondary statistical data, survey data, and analytical procedures used in the study. Section 4 reports the results concerning the development of agricultural service providers, farm-level service use, and changes in service costs. Section 5 discusses the findings in relation to previous studies and the broader role of agricultural services in agricultural and rural development. Finally, the Conclusion summarises the main findings and indicates the limitations of the study.

2. Literature Review

The literature shows that innovative changes in agriculture cannot be limited to production technologies, but must also include organisational solutions and support systems that improve the use of land, labour, capital, and knowledge [3,4]. Agricultural services are one such organisational solution. They can support productivity growth, reduce production constraints, improve the quality of production factors, and facilitate access to specialised knowledge and technology.

Agricultural services cover a wide range of activities and support mechanisms aimed at increasing productivity, efficiency, and sustainable development in agriculture. They include land preparation, sowing, transport, harvesting, threshing, advisory support, financial support, and other activities that are essential for agricultural production. As Yang and Zhang note, the use of services in the agricultural sector helps to alleviate financial, technical, and labour constraints, thereby facilitating the development of agricultural activity [5]. Agricultural services may also contribute to productivity growth through the integration of advanced technologies and the mechanisation of agricultural practices [6]. They play an important role in improving the efficiency of agricultural activities by reducing production costs and supporting sustainable agricultural development, including through improving the structure of expenditure and the quality of agricultural production factors [7].

The use of services is particularly important for small and medium-sized farms, which often face difficulties in carrying out labour-intensive tasks or purchasing specialised machinery. In addition, agricultural services may help address the consequences of an ageing rural population by partially replacing labour with mechanised services [8]. Agricultural services can therefore increase labour productivity by improving resource efficiency, supporting technology diffusion, and promoting more efficient agricultural practices [9,10]. They can also reduce the productivity gap between smaller and larger farms by improving access to resources that would otherwise remain unavailable to many producers [11].

However, the development and use of agricultural services depend not only on demand from farms, but also on the structure and availability of service providers. The number of entities offering agricultural services, their size structure, and their capacity to re-

spond to changing production needs are therefore important factors shaping the role of services in agriculture. For example, agricultural advisory services enable farmers to acquire knowledge and improve their skills [12,13], facilitating modern agricultural practices and the implementation of innovations [14]. Similarly, financial and technical services may help farmers manage risk, improve profitability, and stabilise their production [15].

Beyond their direct role in farm operations, service-related activities linked to crop and livestock production, processing, and marketing can expand local labour demand and create new income opportunities in rural areas [16]. This also suggests an important role for public policy: targeted instruments and investments can reduce structural barriers, strengthen productivity, and trigger job creation not only on farms but also in connected non-farm segments of the rural economy [17].

Nevertheless, while the international literature increasingly recognises the role of agricultural services in improving productivity and efficiency, less attention has been paid to how this sector develops in specific national and regional contexts against the broader structural conditions shaping agricultural development. This is especially relevant in Central and Eastern Europe, where farms continue to face interrelated economic, labour, technological, and organisational constraints. Economic constraints include, for example, chronic underinvestment after the socialist collapse and limited early access to capital [18,19], as well as strong dependence on subsidies, with smaller farms less informed and less able to influence policy [20]. Labour constraints concern differences in the speed/quality of labour transitions [21] or labour outflow, strongly shaped by initial conditions and reform intensity [22]. Technological constraints are associated with technology gaps [23] or historical dependence on centralised fossil-fuel infrastructures [24]. Organisational constraints refer, among others, to the survival of large corporate farms dependent on ownership format, finance, and country-level conditions [25]. As a result, improving agricultural productivity depends not only on farm-level resources but also on access to external support mechanisms, including specialised agricultural services.

Building on this argument, this paper examines agricultural services in Poland as an external support mechanism that may help farms address selected resource, labour, technological, and organisational constraints. The research gap addressed in this study concerns the limited empirical evidence on the development of the agricultural service sector in the Polish and broader Central and Eastern European context, especially with regard to its supply-side structure, farm-level use, and cost dynamics. Therefore, the study assesses the structure of service providers, the scale of service use by farms, and changes in agricultural service costs. The paper addresses the following research questions:

RQ1. How have the number, regional distribution, and size structure of agricultural service providers in Poland changed between 2009 and 2024?

RQ2. How did the use and structure of selected agricultural services change among the surveyed farms in the Mazowieckie region between 2013 and 2024?

RQ3. How did the declared costs of selected agricultural services change among the surveyed farms between 2013 and 2024?

By answering these questions, the paper contributes to the literature by providing empirical evidence from the Polish context and linking the development of agricultural service providers with farm-level service use and cost changes. In doing so, it narrows the broad discussion on sustainable and efficient agriculture to a concrete and testable issue: the role of agricultural services as an organisational mechanism supporting agricultural production.

3. Materials and Methods

The objective of this article is to assess the structural evolution of the agricultural and horticultural services market in Poland, with particular attention to the number and regional distribution of service providers, firm-size structure, farm-level use of selected services, and changes in service costs. The study was quantitative in nature, based on the triangulation of secondary and primary data. Four main segments of service activities were analysed:

1. crop production support services;
2. post-harvest services;
3. services supporting livestock breeding and rearing;
4. landscaping activities.

Phase I: Secondary data analysis

The first stage involved a critical review of the literature, which made it possible to identify research gaps and shape the analytical framework. This was followed by an analysis of statistical data from the Central Statistical Office (CSO), based on the Polish Classification of Activities (PKD). Data were collected for all regions on an annual basis for the years 2009–2024. Changes in the number of entities and the structure of employment in the analysed segments were evaluated. Changes in business dynamics were presented in percentage terms year-on-year, which made it possible to identify long-term trends and turning points.

Mathematical methods were used to assess the dynamics and spatial distribution of the analysed phenomena. The data were summarised spatially, which made it possible to distinguish permanent centres of concentration of service activities, areas of slowed activity, and emergent service markets.

Phase II: Primary research—farmers' survey

The second stage involved an analysis of changes in the level of farmers' interest in using the services, based on surveys. Before participation, all respondents were informed about the purpose and nature of the study, as well as the conditions of their participation. Participation was voluntary, and respondents were free to withdraw from the study at any time without any consequences. The surveys were comparative in nature and were conducted in two cycles: in 2013 and 2024, in Mazowieckie—a region selected based on previous analysis of CSO data as one of the key centres for the provision of the analysed services.

In both analysed years, 100 interviews were conducted with owners of agricultural and horticultural farms. The sample was selected to reflect diversity among respondents in terms of farm size, length of farm ownership, age, and level of education. Therefore, the sampling procedure should be understood as purposive rather than strictly random. In 2013, only face-to-face interviews using a standardised survey questionnaire were used. In 2024, 80% of the interviews were conducted using the same method, while the remaining 20% were completed online using an identical questionnaire. As a result, differences in data collection mode in 2024 and the regional character of the sample limit the possibility of generalising the results to all farms in Poland. Therefore, the survey results are used to complement the analysis based on official statistical data, rather than to draw nationwide conclusions about changes in farmers' behaviour.

Phase III: Econometric analysis—logistic regression

Logistic regression models were used to identify factors influencing service use. Two model configurations were adopted in the analysis:

1. Model 1—the dependent variable was the fact of service use (dichotomous variable: yes/no), and the independent variables were:
 - farm size;

- owner's age;
 - the length of ownership of the farm.
2. Model 2—the effect of farm size (continuous variable) on the intensity of service use was evaluated. Unlike Model 1, in which the dependent variable was dichotomous (service use: yes/no), Model 2 used ordinal logistic regression. The dependent variable was defined as an ordered categorical variable with five levels, corresponding to increasing frequency of service use: 1 = once a year, 2 = 2–4 times a year, 3 = 5–8 times a year, 4 = more than 8 times a year, and 5 = permanent use. These categories have a natural order from lowest to highest service use intensity, but the distances between them are not equal. Therefore, the use of classical linear regression would be inappropriate, whereas ordinal logistic regression is an appropriate method for ordered dependent variables. In the model, the only explanatory variable was farm size (ha), treated as a continuous variable. The model estimates the effect of an increase in farm area on the cumulative probability of a farm being classified in a higher service use intensity category. Odds ratio (OR) coefficients are interpreted as the change in cumulative odds of moving to a higher service intensity category with an increase in farm area by 1 ha.

The models were estimated separately for the 2013 and 2024 data, which made it possible to analyse whether the direction and strength of the observed relationships differed between the two survey waves. The estimation results should be interpreted as exploratory evidence on associations between selected farm characteristics and service use, rather than as a basis for identifying population-level determinants or long-term causal changes.

4. Results

4.1. Changes in the Market for Services in the Agricultural and Horticultural Sector

As indicated by the results of the analyses, there was clear variation in the dynamics of change across the various categories of agricultural and peri-agricultural services in Poland. While the segments directly related to crop and livestock production showed a stabilising or even declining trend, the area of landscape management recorded a systematically increasing trend (Figure 1).

In the case of services supporting crop production, there was a clear upward trend from 2009 to 2015, reaching its peak in 2015 with an increase of as much as 31.75% over the previous year. The acceleration of development may have been stimulated by increased investment in modern technologies, EU support under the CAP, and growing demand for external agrotechnical services. However, after 2015, the data show a long-term slowdown and a systematic decline in the growth of the number of entities providing this type of service. Between 2020 and 2024, the trend of a slight decline, at an average of −0.4% per year, continued, which may indicate market saturation or increased self-sufficiency of farms.

In the case of post-harvest service activities, the segment was characterised by a much lower scale of activity, in terms of the number of entities engaged, but with a relatively stable growth rate from 2009 to 2015. In 2012, the maximum annual growth was recorded at 33.21%. Since 2016, the dynamics slowed down—annual values fluctuated within ±2%, with virtually zero change between 2022 and 2024. This may indicate that the segment reached a relatively stable balance between supply and demand.

In contrast to the above-mentioned segments, animal husbandry services showed the greatest stability throughout the analysed period. Annual changes mainly oscillated between −2% and +4%, which may indicate the maturity of the market and an even distribution of service needs.

In the case of landscaping services, it should be noted that this segment stands out from the rest because of its uninterrupted growth trend throughout the analysis period. Growth of +15.83% in 2010 marked the beginning of a period of expansion that continued uninterrupted until 2024, with a marked acceleration after 2019 (average growth of +7.7% per year). The highest growth was recorded between 2020 and 2024.

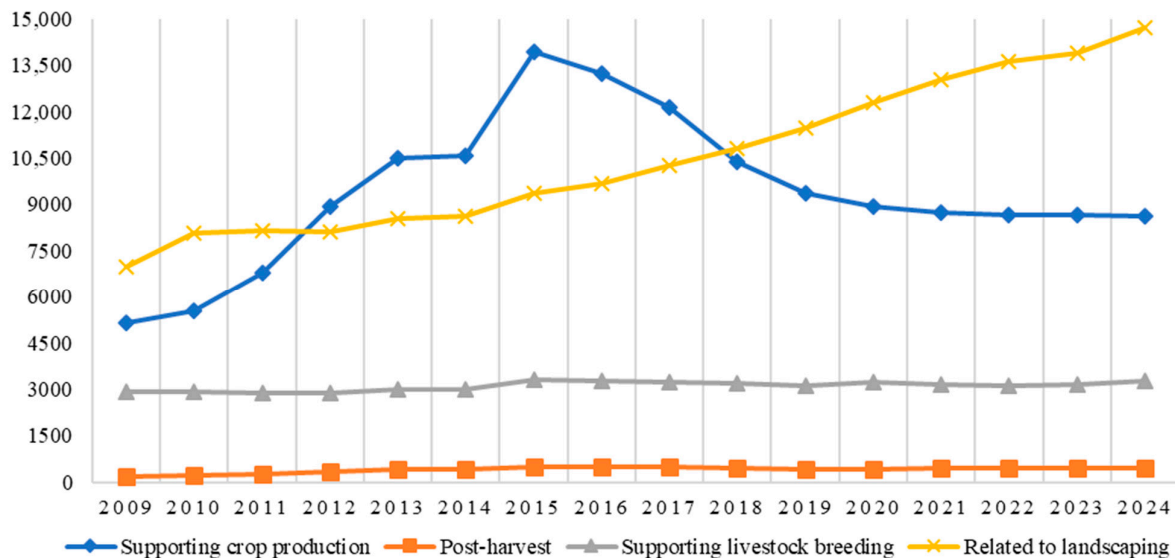


Figure 1. Change in the number of entities providing different types of services in the agro-horticultural sector. Source: own elaboration based on CSO Data.

Analysis of data on regional variation in the number of entities engaged in service activities in the aforementioned areas showed that, in the case of service activities supporting crop production, the largest and most stable number of entities was recorded during the period under study in the Wielkopolskie, Mazowieckie, Lubelskie, and Kujawsko-Pomorskie regions. It should be noted that these regions were characterised by strongly developed commodity agriculture and high production intensity, which stimulates demand for external agricultural services (agrotechnical, plant protection, consulting). In the case of activities supporting livestock breeding, the highest activity in this category was recorded in Wielkopolskie, Mazowieckie, and Podlaskie, i.e., regions with significant importance of livestock production in the structure of agriculture. For example, Podlaskie stands out as the main centre of dairy production in the country, which generates demand for specialised services in this area, while Wielkopolska is characterised by a high concentration of pig and poultry farms. In the case of post-harvest services, the Mazowieckie, Lubelskie, Wielkopolskie, and Kujawsko-Pomorskie regions played a dominant role, i.e., areas of high importance in the cultivation of vegetables, fruits, and herbs. Data on regional diversification of landscaping service activities indicated that this segment was characterised by the most even regional development, with the following regions leading in terms of the number of entities: Mazowieckie, Śląskie, and Wielkopolskie.

An analysis of changes in the number of entities across regions indicated that, in the case of activities supporting crop production in 2009, the dominant regions in terms of the number of entities were Wielkopolskie, Mazowieckie, and Kujawsko-Pomorskie (Figure 2). By 2024, these regions maintained their leadership position, with simultaneous growth in the Lubelskie, Łódzkie, and Podkarpackie regions.

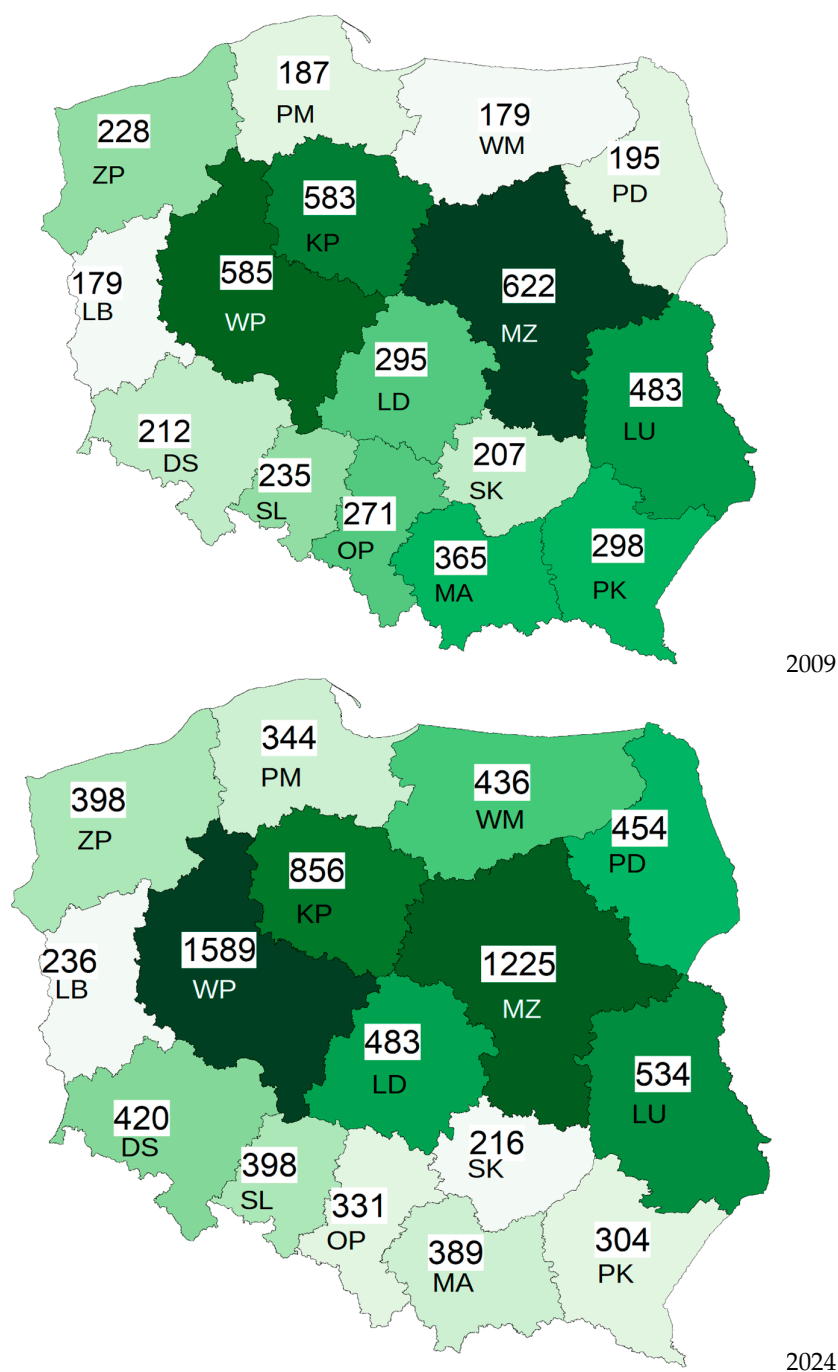


Figure 2. Number of entities engaged in activities supporting crop production in 2009 and 2024. Darker colours indicate a higher number of entities. For map readability, the following two-letter abbreviations are used: Dolnośląskie—DS; Kujawsko-pomorskie—KP; Lubelskie—LU; Lubuskie—LB; Łódzkie—LD; Małopolskie—MA; Mazowieckie—MZ; Opolskie—OP; Podkarpackie—PK; Podlaskie—PD; Pomorskie—PM; Śląskie—SL; Świętokrzyskie—SK; Warmińsko-mazurskie—WM; Wielkopolskie—WP; Zachodniopomorskie—ZP. Source: own compilation based on CSO Data.

In the case of animal husbandry support services in 2009, these activities were mainly concentrated in the Mazowieckie, Podlaskie, and Wielkopolskie regions (Figure 3). Also in 2024, the Mazowieckie and Wielkopolskie regions played a dominant role. In 2024, Zachodniopomorskie ranked third.

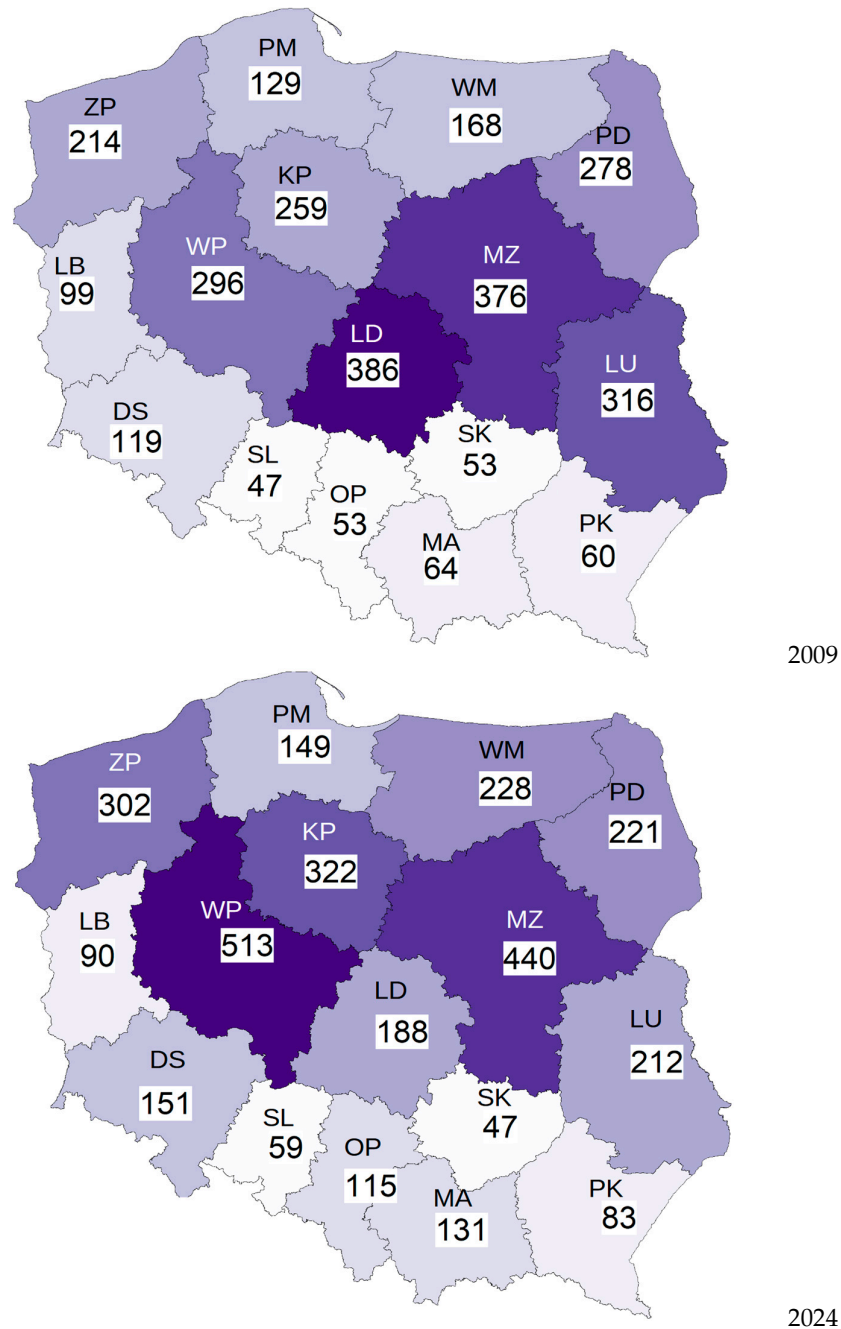


Figure 3. Number of entities engaged in service activities supporting animal husbandry in 2009 and 2024. Darker colours indicate a higher number of entities. For map readability, the following two-letter abbreviations are used: Dolnośląskie—DS; Kujawsko-pomorskie—KP; Lubelskie—LU; Lubuskie—LB; Łódzkie—LD; Małopolskie—MA; Mazowieckie—MZ; Opolskie—OP; Podkarpackie—PK; Podlaskie—PD; Pomorskie—PM; Śląskie—SL; Świętokrzyskie—SK; Warmińsko-mazurskie—WM; Wielkopolskie—WP; Zachodniopomorskie—ZP. Source: own elaboration based on CSO Data.

Post-harvest service activities—in 2009, this was the smallest sector in all regions (Figure 4). Among the leaders were the Mazowieckie, Wielkopolskie, and Lubelskie regions, while in 2024, the leading regions were Wielkopolskie, Kujawsko-Pomorskie, and Opolskie.

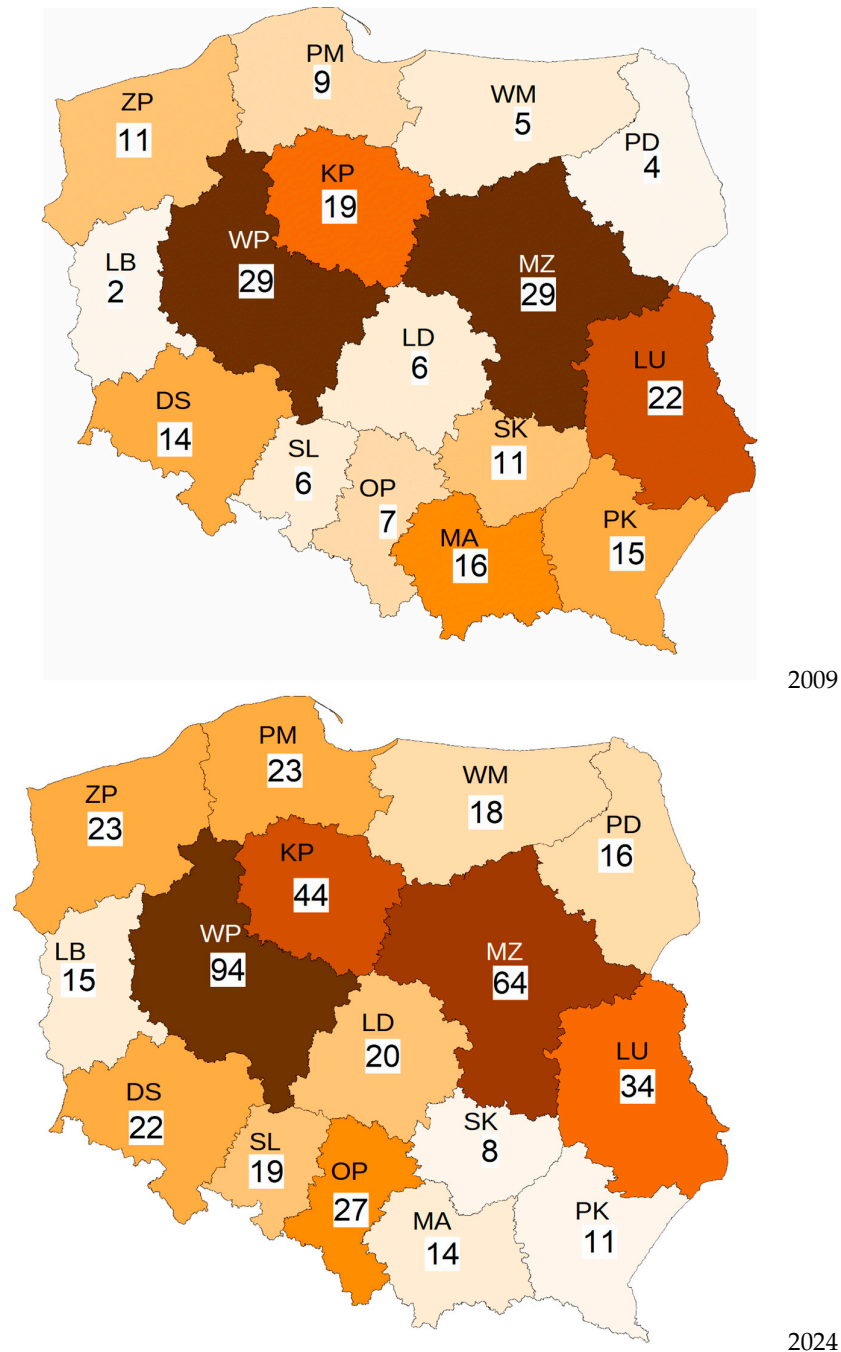


Figure 4. Number of entities engaged in post-harvest service activities in 2009 and 2024. Darker colours indicate a higher number of entities. For map readability, the following two-letter abbreviations are used: Dolnośląskie—DS; Kujawsko-pomorskie—KP; Lubelskie—LU; Lubuskie—LB; Łódzkie—LD; Małopolskie—MA; Mazowieckie—MZ; Opolskie—OP; Podkarpackie—PK; Podlaskie—PD; Pomorskie—PM; Śląskie—SL; Świętokrzyskie—SK; Warmińsko-mazurskie—WM; Wielkopolskie—WP; Zachodniopomorskie—ZP. Source: own elaboration based on CSO Data.

For landscaping activities in 2009, Mazowieckie, Wielkopolskie and Śląskie were the leaders, respectively (Figure 5). By 2024, this activity had significantly increased in all regions, with the same regions remaining the leaders.

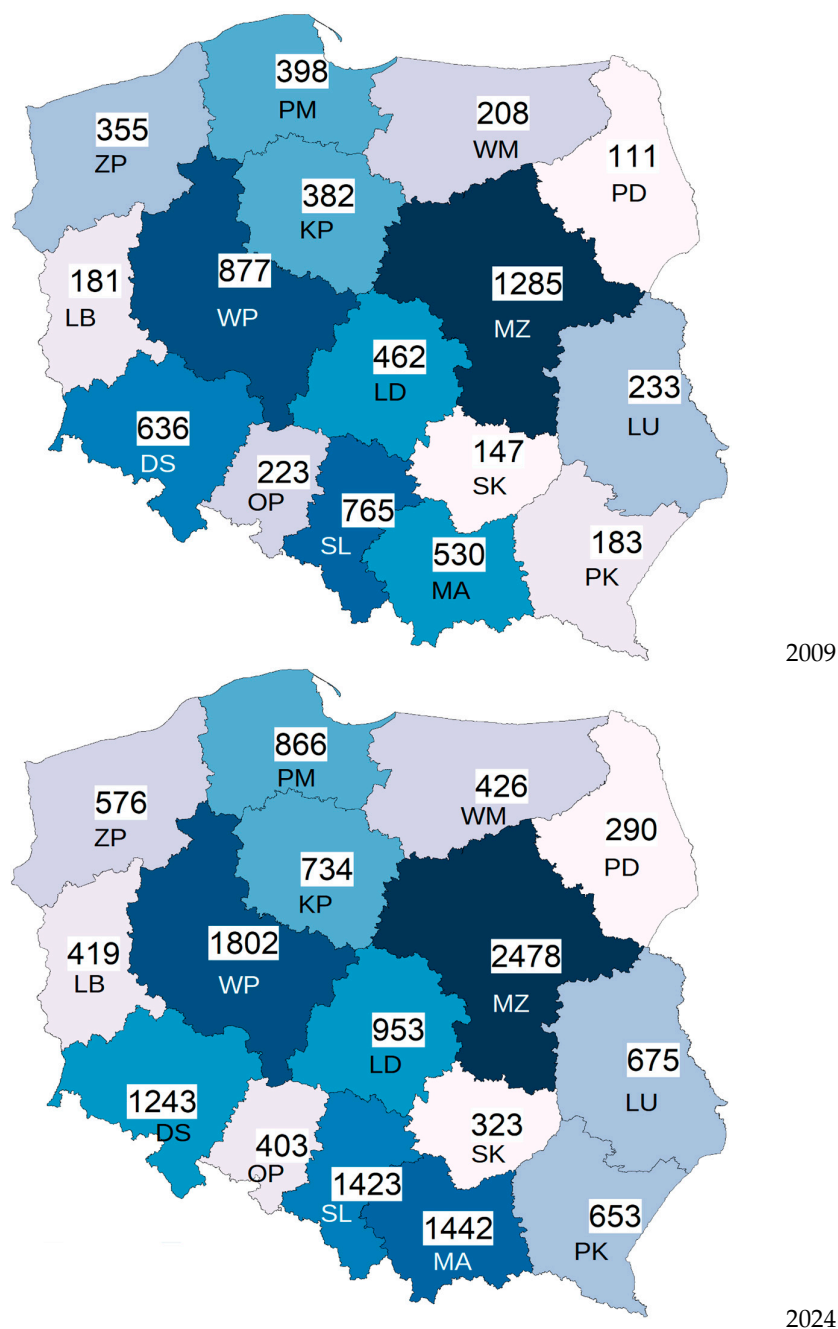


Figure 5. Number of entities providing landscaping services in 2009 and 2024. Darker colours indicate a higher number of entities. For map readability, the following two-letter abbreviations are used: Dolnośląskie—DS; Kujawsko-pomorskie—KP; Lubelskie—LU; Lubuskie—LB; Łódzkie—LD; Małopolskie—MA; Mazowieckie—MZ; Opolskie—OP; Podkarpackie—PK; Podlaskie—PD; Pomorskie—PM; Śląskie—SL; Świętokrzyskie—SK; Warmińsko-mazurskie—WM; Wielkopolskie—WP; Zachodniopomorskie—ZP. Source: own elaboration based on CSO Data.

Analysis of the size structure of enterprises in the categories studied indicated that, in all analysed categories, the vast majority were microenterprises, whose share often exceeded 95% of the total. This is particularly true of the following activities: services supporting crop production and post-harvest activities. Entities with 10–49 employees generally accounted for about 2% to about 8% of the total, while larger enterprises (50–249) were isolated cases. Businesses with more than 250 employees were marginal or non-existent,

confirming the strong atomisation of the market. The landscaping business had a slightly more diverse employment structure; in this case, the share of companies with 10–49 employees reached almost 4%, and there were also sporadic occurrences of units in the 50–249 group (mainly after 2015) (Table 1).

Table 1. Structure of companies in the categories studied (%).

Service Activity	Number of Employees	2009–2012	2013–2016	2017–2020	2021–2024
Supporting crop production	0–9	93.99	97.00	97.23	97.48
	10–49	5.57	2.80	2.61	2.39
	50–249	0.42	0.20	0.15	0.12
	249≥	0.01	0.00	0.00	0.00
Post-harvest activity	0–9	91.78	94.83	95.70	96.40
	10–49	7.27	4.52	3.86	3.49
	50–249	0.94	0.65	0.44	0.11
	249≥	0.00	0.00	0.00	0.00
Supporting live-stock breeding and rearing	0–9	98.65	98.90	98.61	98.47
	10–49	1.18	0.95	1.28	1.42
	50–249	0.07	0.10	0.09	0.08
	249≥	0.10	0.06	0.03	0.03
Related to the landscaping	0–9	96.03	96.62	97.24	97.81
	10–49	3.47	2.97	2.42	1.89
	50–249	0.46	0.41	0.33	0.27
	249≥	0.03	0.01	0.01	0.03

Source: own elaboration based on CSO Data.

4.2. Interest in Using Services Among Farmers—Survey Results

Surveys conducted showed that there was a significant change in the use of third-party services by farmers between 2013 and 2024. The share of farms declaring the use of such services fell from 57% to 45%, while the percentage of farms carrying out work on their own increased from 43% to 55%. This change may reflect growing technical and organisational self-sufficiency of farmers, resulting, among other things, from investments in their own machinery, the rising cost of external services, and the limited availability of service companies in some regions (Figure 6).

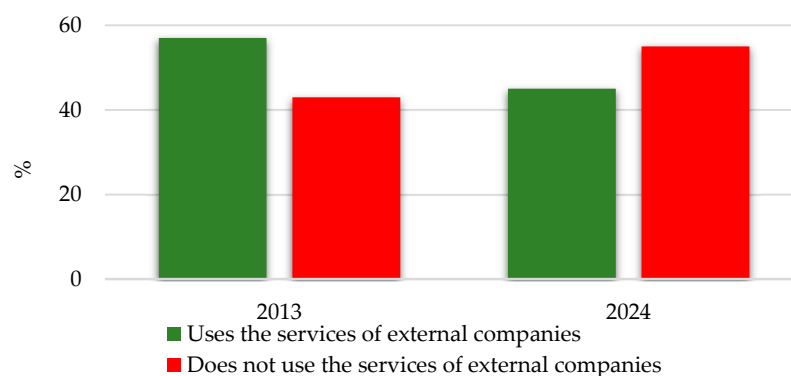


Figure 6. Use of services in surveyed households in 2013 and 2024. Source: own elaboration based on survey data.

Logistic regression's results applying variables such as farm ownership period, farm size, owner age, and service use suggest that, for 2013, none of these variables was statis-

tically significant in the model. Therefore, it should not be concluded that these farm characteristics had no relationship with service use; rather, no statistically significant association was identified in this exploratory model. A similar situation occurred in 2024, where none of the examined factors was statistically significantly associated with service use (Table 2). At the same time, it should be noted that in 2013, the results suggest a slight trend indicating that larger farms used services less frequently. Perhaps this was a result of greater self-sufficiency. In 2024, on the other hand, a slight blurring of differences is noticeable, suggesting that farms, regardless of the owner's age or size, recorded a similar level of use. Of course, limitations resulting from the size of the research sample should be taken into account.

Table 2. Factors affecting the use of services by farmers *.

Parameter	Factor 2013	<i>p</i> -Value 2013	Factor 2024	<i>p</i> -Value 2024
Const.	+5.86	0.31	+1.64	0.80
Period of ownership of the farm	+0.27	0.22	−0.06	0.81
Farm size	−2.59	0.17	+0.80	0.67
Owner's age	−0.07	0.59	−0.07	0.59

* Logistic regression results. Source: own elaboration based on survey data.

In order to determine the association between farm size and the intensity of service use, an ordinal logistic regression model was applied (Table 3). The dependent variable was the intensity of agricultural and horticultural service use, measured as an ordered categorical variable. It comprised five categories reflecting increasing frequency of service use: 1 = once a year, 2 = 2–4 times a year, 3 = 5–8 times a year, 4 = more than 8 times a year, and 5 = permanent use. The explanatory variable was farm size expressed in hectares, which was treated as a continuous variable in the analysis. In 2013, the estimated regression coefficient for farm size amounted to $\beta = 0.061$. The positive value of the coefficient suggests that, as the area of the farm increased, the probability of more intensive use of services increased. This may mean that larger farms were more likely to use services several times a year or even constantly. The odds ratio of 1.063 suggests that an increase in farm size by 1 hectare was associated with an increase in the cumulative odds of reporting a higher level of service use intensity by approximately 6.3%. In practice, this may mean that larger farms used services more often than smaller farms. This relationship may be explained by the larger scale of production, greater demand for specialised services, and better financial capacity, enabling the purchase of such services. Larger farms typically conduct more intensive agricultural production, which requires more frequent use of services related to mechanisation, transportation, advisory support, and technological operations. The analysis of the 2024 model results indicates that the strength of the relationship was slightly lower than in 2013; however, the difference was not substantial. This suggests that, despite ongoing changes in agriculture, the relationship between farm scale and the frequency of service use remained relatively stable over time. This may indicate that, with technological development and increasing production specialisation, services continue to play an important role in the functioning of larger farms. Larger farms may use services more frequently due to the need to optimise labour costs, gain access to modern equipment, and respond to the growing specialisation of agricultural production.

Table 3. Farm size and frequency of service use *.

Year	Factor β	Standard Error	<i>p</i> -Value	OR = e^β
2013	0.061	0.017	<0.001	1.063
2024	0.054	0.019	0.005	1.056

* Ordinal logistic regression results; Source: own elaboration based on survey data.

The obtained results suggest that significant changes occurred in the structure of use of agricultural services in the periods studied. The largest increases were recorded for fruit tree and shrub pruning services, i.e., by 5 pp, and soil analysis by 3 pp (Table 4). Demand for equipment repair services was at a similar level in 2024. However, there was a decline in interest in renting machinery and in using additional insurance and financial advice (−4 pp each), which is a worrying development and may reflect limited confidence in financial services or the difficult economic situation of farmers.

Table 4. Structure of the type of services the surveyed farmers used.

Service	2013	2024	Change
Equipment repair services	27%	28%	+1 pp
Rental of harvesting equipment	20%	18%	−2 pp
Pruning of fruit trees and shrubs	14%	19%	+5 pp
Analysis of soil and plant material	22%	25%	+3 pp
Additional insurances	9%	5%	−4 pp
Economic and financial consulting	9%	5%	−4 pp

Red indicates a decline; green indicates an increase. Source: own elaboration based on survey data.

As can be seen from the data presented above, over the 2013–2024 period, the market for services in the agro-horticultural sector in Poland has changed. This is also visible in the costs of key service categories. Average costs of services have increased in almost all segments, although the rate of this increase and its structure differ significantly between categories. It should be noted that these changes were probably influenced by many factors, such as inflation, technological developments, professionalisation of services, and the changing regulatory and market environment. The greatest relative changes in costs incurred can be seen in services with a high degree of specialisation, and those involving labour-intensive work, including those that have undergone technological transformation. An example is the cutting of fruit trees and bushes, where the average price increased by 442.2% and the minimum price by 300% (Table 5). This change may suggest a shortage of skilled seasonal labour, which translates into higher prices for these services. An even more dynamic increase in the average costs incurred by farms, of 552.7%, occurred in the case of soil and plant material analysis, despite a 16.7% decrease in the maximum price. On the other hand, in the case of rental of agricultural equipment, there was a significant increase in the maximum cost, i.e., +130%, and the minimum cost, +328.6%, with a moderate increase in the average value of +34.9%. Equipment repair services recorded a 48.5% increase in average cost, while minimum costs increased by as much as 133.3%. Meanwhile, the economic and financial consulting segment saw an 88.3% increase in average costs, with a decrease in maximum costs (−18.8%) and a strong increase in minimum costs (+233.3%). Additional insurances show the opposite trend, i.e., despite an increase in minimums by 100%, average costs increased by only 17.3%, and maximums fell by 30%. Cross-sectionally, the data from 2013–2024 show not only an increase in costs for farmers but also changes in the structure of the agricultural services market in Poland.

Table 5. Costs of the most commonly purchased services.

Type of Service	2013—Min (PLN)	2013—Max (PLN)	2013—Av- erage (PLN)	2024—Min (PLN)	2024—Max (PLN)	2024—Av- erage (PLN)	Change %—Min	Change %—Max	Change %—Aver- age
Equipment re- pair services	300.00	30,000.00	5181.82	700.00	35,000.00	7694.00	133.33	16.67	48.48
Harvesting equipment rental	350.00	40,000.00	4006.25	1500.00	92,000.00	5405.00	328.57	130.00	34.91
Pruning of fruit trees and shrubs	2000.00	20,000.00	8411.76	8000.00	56,000.00	45,605.00	300.00	180.00	442.16
Analysis of soil and plant ma- terial	50.00	6000.00	550.00	150.00	5000.00	3590.00	200.00	−16.67	552.73
Additional in- surances	500.00	50,000.00	12,409.09	1000.00	35,000.00	14,560.00	100.00	−30.00	17.33
Economic and financial con- sulting	150.00	8000.00	1304.55	500.00	6500.00	2456.00	233.33	−18.75	88.26

An increase in colour intensity indicates a higher cost. Source: own elaboration based on survey data.

5. Discussion

By substituting service use for ownership of expensive machinery and specialised inputs, farms may be able to ease capital constraints and improve allocative efficiency. This is in line with [26], which shows that the use of agricultural services varies across EU regions according to farm structure and resource endowment, while contributing to the optimisation of production costs and inputs. At the same time, the strong regional variation observed suggests that service availability and its economic effects depend on local agrarian structures, production profiles, and institutional and infrastructural conditions. This pattern aligns with studies indicating that Poland's EU accession in 2004 was a key trigger for service-market development through higher farm incomes and investment capacity enabled by CAP support [27,28]. CAP instruments also accelerated structural change: land concentration, specialisation, and scaling-up [29], which typically increases demand for specialised contracting and related services. However, the pace of transformation has also been described as too slow relative to competitiveness needs [30], which makes services an important “accelerator” of modernisation, allowing farms to adopt new solutions without fully internalising fixed-capital costs. The growing relevance of digital and precision technologies adds to this interpretation: although uptake remains limited and constrained by R&D and investment gaps [31], service providers can lower entry barriers by offering technology bundled with expertise. Finally, the expansion of equipment rental markets, strengthened in the post-COVID-19 period and projected to continue growing strongly [32], reinforces the role of services in reducing financial burdens and improving productivity, while highlighting persistent territorial disparities that matter for rural development outcomes.

6. Conclusions

The study assessed the development and use of agricultural services in Poland, with particular attention to changes in the number, regional distribution, and size structure of service providers, the use of selected services by farms, and changes in service costs.

Concerning RQ1, the results based on official statistical data show that the agricultural and horticultural services market in Poland changed substantially between 2009 and 2024. The dynamics differed across service segments. Services supporting crop production expanded strongly until 2015 and then stabilised or slightly declined. Post-harvest services remained a relatively small and stable segment, while services supporting livestock breeding and rearing showed the greatest stability. Landscaping services followed a different path, recording continuous growth, especially after 2019. The regional distribution of service providers reflected agricultural and horticultural specialisation, with high concentrations in regions such as Mazowieckie, Wielkopolskie, Lubelskie, Kujawsko-Pomorskie, and Podlaskie. The sector was strongly dominated by micro-enterprises, while medium-sized and large firms played only a marginal role. These conclusions are supported by official statistical data.

Concerning RQ2, the survey results indicate that the declared use of external services by farms decreased from 57% in 2013 to 45% in 2024. The structure of service use also changed: demand increased for fruit tree and shrub pruning and soil and plant material analysis, while the use of additional insurance and economic and financial consulting declined. The logistic regression results showed no statistically significant effect of farm size, owner age, or length of farm ownership on whether services were used. Therefore, these findings should be interpreted cautiously: they indicate only that no significant relationship was detected in the analysed sample and model specification.

For RQ3, the survey data show that the costs of most selected agricultural services increased between 2013 and 2024, especially for soil and plant material analysis and fruit tree and shrub pruning. More moderate increases were observed for equipment repair, harvesting equipment rental, economic and financial consulting, and additional insurance. These results suggest changes in the cost structure of agricultural services, particularly in more specialised and labour-intensive categories. However, as they are based on survey data, they should be treated as indicative rather than fully representative of the entire market.

The findings point to several cautious practical implications. Support for the agricultural and horticultural services market should take into account the strong dominance of micro-enterprises, as their development conditions may differ from those of larger firms. Measures aimed at this sector should therefore consider the needs of small service providers, especially in relation to access to information, advisory support, and investment capacity. Second, the regional concentration of service providers also indicates that support measures should reflect regional differences in agricultural and horticultural specialisation. The market for services is not evenly distributed across Poland, and its development appears to be linked to the structure of agricultural production in particular regions. Finally, an increase in the costs of selected services suggests that service affordability may require further monitoring, particularly in the case of specialised and labour-intensive services. However, these results should be treated as indicative, as they are based on survey data.

Overall, the study shows that the agricultural services market in Poland has undergone clear structural changes on the supply side. The most robust evidence concerns the long-term development, regional distribution, and size structure of service providers. The survey-based results concerning farm-level service use and service costs provide useful insight into changes between 2013 and 2024, but they are subject to limitations related to sample size and survey design. For this reason, conclusions regarding farmers' behaviour,

determinants of service use, and cost changes should be treated as indicative rather than definitive. The findings indicate a need for further research based on larger and more representative samples. This would make it possible to verify whether the patterns observed in the survey are also present in the wider population of farms and to assess more precisely the determinants of service use and changes in service costs.

Author Contributions: Conceptualization, W.S.-M. and N.D.; methodology, W.S.-M. and N.D.; software, W.S.-M. and N.D.; validation, W.S.-M. and N.D.; formal analysis, W.S.-M. and N.D.; investigation, W.S.-M. and N.D.; resources, W.S.-M. and N.D.; data curation, W.S.-M. and N.D.; writing—original draft preparation, W.S.-M. and N.D.; writing—review and editing, W.S.-M. and N.D.; visualization, W.S.-M. and N.D.; supervision, W.S.-M. and N.D.; project administration, W.S.-M. funding acquisition, N.D. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Ethical review and approval were waived for this study. This study was conducted in accordance with the Declaration of Helsinki. Respondents were assured of anonymity. They took part in the survey voluntarily. They could resign from the survey at any time. They were not asked for personal or sensitive data.

Informed Consent Statement: Informed consent for participation was obtained from all subjects involved in the study.

Data Availability Statement: The data used in this study were obtained partly from official statistical sources, which are cited in the relevant sections of the manuscript. Survey-based data are reported in aggregated form in the article. Additional information may be obtained from the corresponding author upon reasonable request.

Conflicts of Interest: The authors declare no conflicts of interest.

References

1. Tengberg, A.; Torheim, S.I.B. The role of land degradation in the agriculture and environment nexus. In *Climate and Land Degradation*; Sivakumar, M.V.K., Ndiang'ui, N., Eds.; Springer: Berlin, Germany, 2007; Chapter 14. https://doi.org/10.1007/978-3-540-72438-4_14.
2. Giller, K.E. The food security conundrum of Sub-Saharan Africa. *Glob. Food Secur.* **2020**, *26*, 100431. <https://doi.org/10.1016/j.gfs.2020.100431>.
3. Komorowski, Ł.; Stanny, M. Smart villages: Where can they happen? *Land* **2020**, *9*, 151.
4. Norton, R.D. Policy frameworks for international agricultural and rural development. In *Encyclopedia of Agriculture and Food Systems*; Elsevier: Amsterdam, The Netherlands, 2014. <https://doi.org/10.1016/B978-0-444-52512-3.00123-6>.
5. Yang, S.; Zhang, F. The impact of agricultural machinery socialization services on the scale of land operation: Evidence from rural China. *Agriculture* **2023**, *13*, 1594.
6. Bai, Y.; Wei, Y.; Liao, R.; Liu, J. The role of agricultural socialized services in unlocking agricultural productivity in China: A spatial and threshold analysis. *Agriculture* **2025**, *15*, 957. <https://doi.org/10.3390/agriculture15090957>.
7. Na, H.; Yan, X.; Xing, R.; Liu, Y.; Zhang, H. The empirical effect of agricultural social services on pesticide inputs. *Sci. Rep.* **2024**, *14*, 15907. <https://doi.org/10.1038/s41598-024-67016-7>.
8. Zhang, C.; Zhang, J.; Fu, Z.; Tian, M. A study on the impact of population aging on the agricultural socialized services. *Agriculture* **2025**, *15*, 577.
9. Zhou, Z.; Zhang, K.; Wu, H.; Liu, C.; Yu, Z. Land transfer or trusteeship: Can agricultural production socialization services promote grain scale management? *Land* **2023**, *12*, 797.
10. Turner, B.L.; Fuhrer, J.; Wuellner, M.; Menendez, H.M.; Dunn, B.H.; Gates, R. Scientific case studies in land-use driven soil erosion in the Central United States. *Int. Soil Water Conserv. Res.* **2018**, *6*, 63–78.
11. Lowder, S.K.; Sánchez, M.V.; Bertini, R. Which farms feed the world, and has farmland become more concentrated? *World Dev.* **2021**, *142*, 105455.

12. Labarthe, P.; Laurent, C.; Prager, K.; Kania, J.; Madureira, L.; Ndah, T.H. Privatization of agricultural extension services in the EU: Towards a lack of adequate knowledge for small-scale farms? *Food Policy* **2013**, *38*, 240–252.
13. Prager, K.; Creaney, R.; Lorenzo-Arribas, A. Criteria for a system level evaluation of farm advisory services. *Land Use Policy* **2017**, *61*, 86–98. <https://doi.org/10.1016/j.landusepol.2016.11.003>.
14. Knierim, A.; Labarthe, P.; Laurent, C.; Prager, K.; Kania, J.; Madureira, L.; Ndah, T.H. Pluralism of agricultural advisory service providers: Facts and insights from Europe. *J. Rural Stud.* **2017**, *55*, 45–58. <https://doi.org/10.1016/j.jrurstud.2017.07.018>.
15. Du, J.; Li, Y. The impact and spatial difference of agricultural producer services industry on agricultural development: An empirical analysis based on provincial panel data. *Int. J. Serv. Technol. Manag.* **2018**, *24*, 173–194.
16. Wilson, P.N. Nontraditional agriculture: An economic development alternative. In *Economic Adaptation: Alternatives for Nonmetropolitan Areas*; Routledge: London, UK, 2019; pp. 185–204. <https://doi.org/10.4324/9780429041082-11>.
17. Matthews, A. How can the CAP promote rural jobs? *EuroChoices* **2017**, *16*, 18–21. <https://doi.org/10.1111/1746-692x.12176>.
18. Pawłowski, K.P.; Czubak, W.; Zmysłona, J.; Sadowski, A. Overinvestment in selected Central and Eastern European countries: Production and economic effects. *PLoS ONE* **2021**, *16*, e0251394. <https://doi.org/10.1371/journal.pone.0251394>.
19. Masek, J.; Novak, P. Overview of combine harvester and tractor structure on farms in the Czech Republic. In *Engineering for Rural Development*; Latvia University of Agriculture: Jelgava, Latvia, 2018; Volume 17, pp. 240–245. <https://doi.org/10.22616/ER-Dev2018.17.N282>.
20. Mazancová, K.; Martinát, S.; Pícha, K.; Navrátil, J. Perceived and “real” importance of subsidies for agricultural enterprise management: The case of the Czech Republic. *SAGE Open* **2025**, *15*, 21582440251324756. <https://doi.org/10.1177/21582440251324756>.
21. Symeonaki, M.; Stamatopoulou, G. On the measurement of positive labor market mobility. *SAGE Open* **2020**, *10*, 2158244020934489. <https://doi.org/10.1177/2158244020934489>.
22. Drejerska, N. *Przemiany Sektorowej Struktury Zatrudnienia Ludności Wiejskiej*; Wydawnictwo SGGW: Warszawa, Poland, 2018.
23. Vanschoenwinkel, J.; Mendelsohn, R.; Van Passel, S. Do Western and Eastern Europe have the same agricultural climate response? Taking adaptive capacity into account. *Glob. Environ. Change* **2016**, *41*, 74–87. <https://doi.org/10.1016/j.gloenvcha.2016.09.003>.
24. Rabbi, M.F. Unlocking sustainability in the EU food system: A regional analysis of sectoral carbon emission drivers and SDG-12 performance. *Sustain. Horiz.* **2025**, *15*, 100144. <https://doi.org/10.1016/j.horiz.2025.100144>.
25. Fertő, I.; Bojnc, Š.; Iwasaki, I.; Shida, Y. Why do corporate farms survive in Central and Eastern Europe? *Agric. Syst.* **2024**, *218*, 103965. <https://doi.org/10.1016/j.agsy.2024.103965>.
26. Kołodziejczak, M. The use of agricultural services in European Union regions differing in selected agricultural characteristics. *Agriculture* **2024**, *14*, 2346. <https://doi.org/10.3390/agriculture14122346>.
27. Pawlak, K.; Poczta, W. Twenty years of Poland’s EU membership: What is progress in the Agri-Food sector? *Agriculture* **2024**, *15*, 49. <https://doi.org/10.3390/agriculture15010049>.
28. Jeżyńska, B. Polskie struktury agrarne w perspektywie 20 lat Wspólnej Polityki Rolnej. *Prz. Prawa Rol.* **2024**, *2*, 51–65. <https://doi.org/10.14746/ppr.2024.35.2.4>.
29. Kołodziejczak, A. Changes in ownership and production structure of agriculture. In *Economic Geography*; Springer: Cham, Switzerland, 2022; pp. 171–196. https://doi.org/10.1007/978-3-031-06108-0_8.
30. Radlińska, K. Structural changes in agriculture: Size, technical efficiency and specialization of Polish farms. *Ann. Pol. Assoc. Agric. Agribus. Econ.* **2025**, *27*, 174–187. <https://doi.org/10.5604/01.3001.0055.0758>.
31. Kosior, K. Research and development projects for digital agriculture in Poland. *Ann. Pol. Assoc. Agric. Agribus. Econ.* **2023**, *25*, 124–139. <https://doi.org/10.5604/01.3001.0016.2309>.
32. Juściński, S. The market for renting tractors and agricultural machinery as an element of sustainable agriculture. In *Farm Machinery and Processes Management in Sustainable Agriculture*; Lecture Notes in Civil Engineering; Springer: Cham, Switzerland, 2024; pp. 190–202. https://doi.org/10.1007/978-3-031-70955-5_21.

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.