

ECONOMIC AND SOCIAL DIMENSIONS OF AGRI-FOOD SECTOR IN THE SLOVAK REPUBLIC

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Abstract

The aim of the paper is to analyse selected economic and social aspects of the agri-food sector in the Slovak Republic. The source of data was the Statistical Office of the Slovak Republic as well as the National Agricultural and Food Centre Branch: Research Institute of Agriculture and Food Economics. A typical feature of Slovakia is that its territory is mainly dominated by rural areas, of which agriculture is an integral part, fulfilling not only an economic but also a social role. According to the latest Structural Farm Survey, there are 25658 farms in Slovakia, owned by legal and natural persons, which manage 1,889,819 ha of utilised agricultural land. The largest group is made up of registered and unregistered natural persons (87.8 %) and the smallest group is made up of legal persons (12.2 %). The situation is reversed in terms of the size of the land farmed, with legal persons farming 80.0 % of the agricultural land and natural persons farming only about 20 %. The number of persons employed in agriculture is 46.46 thousand and the remuneration of employees is lower than in other sectors of the national economy. In terms of status, employees account for 87.4% and entrepreneurs 12.6%.

Key words: agriculture, food industry, utilised agricultural land, rural areas, employment

INTRODUCTION

According to a study on income situation in the agricultural sector [4], which examined the differences in income per worker between the new EU-12 and the former EU-15 countries and considered the costs of land (rent), labour and capital as factors driving income differentials, the labour force declined by up to 25% between 2000 and 2009.

[7] and [9] state that “labour force transference is a pivotal strategy for enhancing farmers' income. Cross-regional labour mobility contributes to increasing farmers' income levels and reducing the income disparity between urban and rural populations to a notable extent”.

Important factor that impacts farmers' income is the value of commodities. Increases in the prices of agricultural and side-line products bolster farmers' earnings [2] and [13]. Additionally, state subsidies are also crucial factors influencing farmers' income [8]. Several scholars argue that “various factors, including farmers' educational level, health status, physical capital, labour force quantity

and quality, cultivable land area, geographic location, access to bank loans, and willingness to transfer land, significantly influence farmers' income. Additionally, social capital has garnered increasing scholarly attention as a crucial determinant” [6].

The social aspect of agriculture and food production is understood, according to [1, 11], as employment, wage level, labour reproduction, and educational level. Agriculture plays a less important role in job creation than other sectors of the national economy. The development of agricultural population has undergone a degressive trend over the last decades and is heading towards potential complications for the reproductive base of the agricultural labour force. Another persistent obstacle is ensuring the stabilization of a sufficiently educated workforce, which is one of the prerequisites for economic growth and innovative development of this sector.

The modernization of agricultural enterprises ensures an increase in work efficiency and at the same time replaces live labour and reduces labour costs, which is reflected in their efficiency and competitiveness. The competitive success of the agrarian sector is

also influenced by the technical and technological equipment of production and the efficiency of the use and annual renewal of fixed assets of agricultural enterprises [5].

Production efficiency and support policies are crucial factors influencing the income situation and economic stability of agriculture [12]. Other determinants include the optimal structure of production, cost-effectiveness with an impact on employment, renewal of fixed capital and assured marketing of production. Recent years have been characterised by a preference for crop production over livestock production, with a different development in the scale and intensity of production (lagging behind neighbouring countries) and a loss of the status and production potential of livestock production (a decline in the number of animals, especially cattle). In the business structure, the share of commercial companies is growing, and the share of agricultural cooperatives and self-employed farmers is decreasing [3].

[10] annually produce a publication called "Panorama of the food industry", which states that in terms of the macroeconomic position, the production of food, beverages and tobacco products in the Czech Republic in 2020 contributed 2.19% to the gross value added in current prices and 2.59% to employment. Nevertheless, this sector is one of the major employers, as in the whole EU. In terms of the number of employees (including the amount of personnel costs), the strongest group was "Manufacture of bakery, confectionery and other flour products", which is related to the need to supply fresh bakery products to the market network on a daily basis throughout the territory of the Czech Republic. This group employed 34.4% of the employees in the food industry. The production of flour products, including the production of meat products (24.4%) and dairy products (9.6%), employs a total of 68.4% of the food industry's workforce.

MATERIALS AND METHODS

The analyses were carried out using data from the Statistical Office of the Slovak Republic,

in particular the Structural Farm Survey (formerly called the "Agricultural Census of Farms"), which uses the same methodological procedure for all EU Member States to ensure compatibility and possible comparison within EU countries. The latest data from the 2020 Farm Structural Survey were published in 2022. The survey included all agricultural enterprises - farms engaged in crop or livestock production, regardless of the scale of production, as well as households that reached one of the threshold values set for farms in the Slovak Republic.

Monitoring employment in agriculture is quite complex due to the existence of multiple sources, namely the "enterprise method", the Labour Force Sample Survey and the Structural Farm Census. The volume of work, expressed in terms of the number of workers, is considerably underestimated in agriculture because seasonal fluctuations in labour consumption are considered in enterprise reporting under the heading "services to agriculture - contract work for agriculture" (i.e., contracted labour) and are not reflected in labour costs.

Data for the food industry were used from the Statistical Office of the Slovak Republic. The macroeconomic situation of agriculture and food industry in terms of socio-economic aspects was expressed by the participation of these sectors in the national economy during the period 2013-2020. This concerned the development of the share of agricultural and food industry indicators in indicators of the national economy of Slovakia, gross value added and employment.

The data were processed using common standard research methods such as analysis and synthesis, comparisons, sorting of enterprise sets and graphical representation of the development of selected indicators over a period of time.

RESULTS AND DISCUSSIONS

Characteristics of Slovakia's territory and social aspect of the countryside

The territory of the Slovak Republic covers an area of 4 903 434 ha. Of this, non-agricultural land accounts for 51.4% and agricultural land

for 48.6% (Table 1). The largest share of the area of non-agricultural land is forest land (41.3%). Agricultural land occupies almost

half of the total area (48.6%) and arable land accounts for 28.8% of the territory of the Slovak Republic.

Table 1. Structure of Slovak republic land area in 2020 (in ha)

Land area in the SR	ha	%	Share of the area	ha	%
Agricultural land	2 385 328.1	48.6	Arable land	1,409,777.9	28.75
			Hop plants	510.5	0.01
			Vineyards	26,266.5	0.54
			Gardens	76,205.7	1.55
			Orchards	16,685.2	0.34
			Permanent grass lands	855,882.2	17.45
Non-agricultural area	2 518 106.5	51.4	Forest lands	2,022,522.3	41.25
			Water areas	95,257.1	1.94
			Built-up areas and courtyards	236,281.1	4.82
			Other area	164,046.0	3.35
Total	4 903 434.6	100.0		4,903,434.6	100.00

Source: Statistical office of the Slovak republic; National Agricultural and Food Centre Branch: Research Institute of Agriculture and Food Economics.

Since Slovakia's accession to the EU, the term subsidized utilized agricultural land (1 910 654 ha) has been used, which is 20% less than the total agricultural land of the Slovak Republic (Fig. 1). Trends in the development of agricultural land document that since 2007

there has been a slight decrease in utilised agricultural land and a gradual slight increase in forest land. Arable land has maintained the same level, except for small fluctuations in 2009 and 2010.

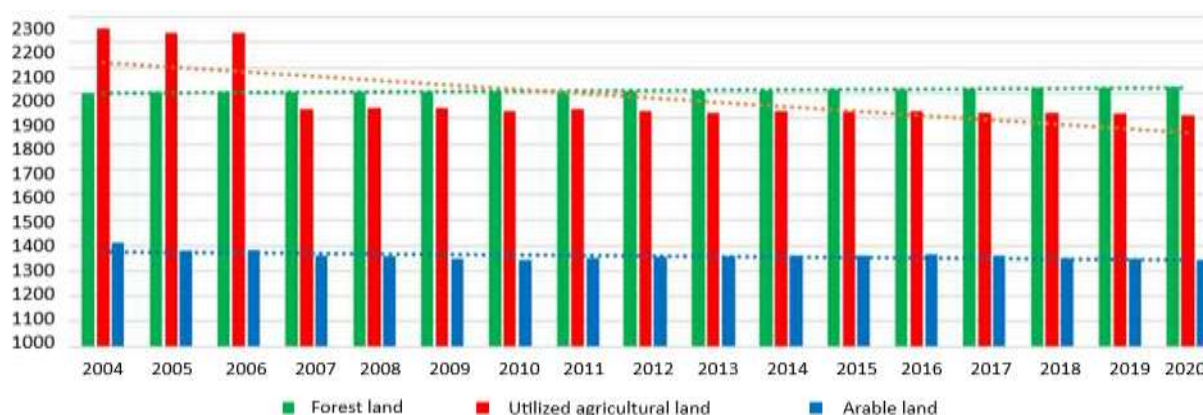


Fig. 1. Development of utilized agricultural land (in thousands of ha)

Legend: BA – Bratislava region, TT – Trnava region, TN – Trenčín region, NR – Nitra region, ZA – Žilina region,
Source: Statistical office of the Slovak republic.

Rural areas

Slovakia is dominated by rural areas, an integral part of which is agriculture and its associated productive efficiency, which as one of the key elements influences the economic and social level of its inhabitants. Despite the application of the Common Agricultural Policy to reduce regional disparities after EU accession, significant regional disparities

persist in Slovakia. Rural areas, which are characterised by their agriculturally disposable land, represent an untapped potential for at least partially solving the unemployment problem and developing the rural settlement structure.

Slovakia has a total population of 5.5 million inhabitants with an average population density of 110.5 inhabitants per 1 km². The degree of

rurality of a territory, determined on the basis of the Eurostat methodology, is expressed as the proportion of the population living in rural municipalities. In terms of the share of total area of Slovakia, rural regions predominate, together with the transition regions, which together cover almost the entire territory of the Slovak Republic (95.8%). Predominantly urban regions make up a small part of the Slovak Republic, accounting for 4.2% of the

country's total area (Table 2). People with permanent residence in municipalities classified as "transition regions" make up half (50.9%) of the total population of the Slovak Republic. Together with people from "predominantly rural regions" (37.5%), they make up 88.4%. The smallest share of permanently living people is in predominantly urban areas, namely 11.7%.

Table 2. Structure of Slovak Republic land area in 2020 (in ha)

Region	Area in km ²	Share on the SR area in %	Population of the region	Populationshares in the SR in %
Mostly urban regions	2,053	4.2	633,288	11.7
Transitional regions	24,409	49.8	2,759,546	50.9
Predominantly rural regions	22,573	46.0	2,033,418	37.5
SR in total	49,035	100.0	5,426,252	100.0

Source: Statistical office of the Slovak republic; National Agricultural and Food Centre Branch: Research Institute of Agriculture and Food Economics.

Farm Structural Survey and labour force development in agriculture

The business structure in Slovakia consists of commercial farms (based on the principle of trading companies and agricultural cooperatives) and farms of natural persons. According to the 2020 Farm Structure Survey, there were 25,658 farms owned by legal

entities and natural persons in Slovakia, managing 1,889,819 ha of agricultural land. In terms of numbers, the majority group consisted of natural persons' enterprises, both registered and unregistered, with a share of 87.8 %, and the minority group consisted of legal persons' enterprises with a share of 12.2 % (Table 3).

Table 3. Structure of Slovak Republic land area in 2020 (in ha)

Agricultural enterprises	2013				2016				2020			
	Number	Share in number (%)	Area (ha)	Share in area (%)	Number	Share in number (%)	Area (ha)	Share in area (%)	Number	Share in number (%)	Area (ha)	Share in area (%)
Legal persons	2,276	9.3	1,529,083	80.7	2,666	11.3	1,531,331	80.5	3,139	12.23	1,511,949	80.0
Trade companies					2,094		826,139		2,465		836,586	
Agricultural cooperatives. State estates. State enterprises					572		705,192		674		675,363	
Natural persons	22,187	90.7	366,417	19.3	20,900	88.7	370,283	19.5	22,519	87.77	377,870	20.0
Registered	6,008		316,370		5,469		311,580		5,996		307,551	
Unregistered	16,179		50,047		15,431		58,703		16,523		70,319	
Legal and natural persons in total	24,463	100.0	1,895,500	100.0	23,566	100.0	1,901,614	100.0	25,658	100.0	1,889,819	100.0

Source: Ministry of Agriculture and Rural Development of the Slovak Republic; National Agricultural and Food Centre Branch: Research Institute of Agriculture and Food Economics.

In terms of size of the cultivated land, the situation is reversed, with 80.0% of

agricultural land being cultivated by legal entities and approximately 20% by natural

persons. Compared to 2013, there has been a decrease in the area of legal entities (1.1%, 17 thousand ha) and an increase in the area of natural persons (3.1%, 12 thousand ha). A large number of small farms cultivate a small share of the total agricultural area, while a relatively small number of large farms have a predominant share of the total agricultural area. The size structure of farms was

significantly differentiated (Table 4). Most farms (47.3%) operated on an area of less than 5 ha. 9.6 % of the total number of farms operated on an area of more than 100 ha, which is crucial for production and for maintaining the rural agricultural landscape in good condition. Of these, only 2.2 % of farms were operating on more than 1,000 ha.

Table 4. Structure of farms of legal and natural persons in Slovakia according to intervals of agricultural land size in 2020

Groups of enterprises according to farmed land (ha)	Enterprises in total				Enterprises of legal persons - trade companies				Enterprises of legal persons - agricultural cooperatives, state estates, state enterprises				Enterprises of natural persons				Unregistered enterprises of natural persons			
	Number		Area		Number		Area		Number		Area		Number		Area		Number		Area	
	abs.	%	ha	%	abs.	%	ha	%	abs.	%	ha	%	abs.	%	ha	%	abs.	%	ha	%
0	2,286	8.9	22	0.0	93	3.8	0	0.0	5	0.7	0	0.0	144	2.4	0	0.0	2,044	12.4	22	0.0
0 - 5	12,124	47.3	29,448	1.6	224	9.1	635	0.1	12	1.8	25	0.0	1,283	21.4	3,564	1.2	10,605	64.2	25,224	35.9
5 - 10	3,537	13.8	25,448	1.3	219	8.9	1,679	0.2	21	3.1	153	0.0	957	16.0	7,159	2.3	2,340	14.2	16,458	23.4
10 - 50	4,370	17.0	94,365	5.0	571	23.2	14,761	1.8	65	9.6	1,575	0.2	2,236	37.3	52,434	17.0	1,498	9.1	25,595	36.4
50 - 100	941	3.7	66,920	3.5	261	10.6	18,871	2.3	31	4.6	2,231	0.3	619	10.3	43,852	14.3	30	0.2	1,966	2.8
100 - 500	1,399	5.5	331,061	17.5	603	24.5	158,501	18.9	103	15.3	30,972	4.6	688	11.5	140,533	45.7	5	0.0	1,054	1.5
500 - 1,000	446	1.7	325,303	17.2	234	9.5	171,020	20.4	163	24.2	122,631	18.2	49	0.8	31,653	10.3	0	0.0	0	0.0
1,000 - 1,500	256	1.0	310,938	16.5	127	5.2	151,487	18.1	112	16.6	138,919	20.6	17	0.3	20,532	6.7	0	0.0	0	0.0
1,500 - 2,000	135	0.5	233,239	12.3	58	2.4	100,047	12.0	76	11.3	131,311	19.4	1	0.0	1,881	0.6	0	0.0	0	0.0
2,000 - 2,500	69	0.3	151,868	8.0	30	1.2	67,005	8.0	38	5.6	82,839	12.3	1	0.0	2,024	0.7	0	0.0	0	0.0
2,500 - 3,000	33	0.1	88,306	4.7	14	0.6	37,483	4.5	19	2.8	50,822	7.5	0	0.0	0	0.0	0	0.0	0	0.0
3,000 - 3,500	26	0.1	84,569	4.5	14	0.6	45,882	5.5	12	1.8	38,687	5.7	0	0.0	0	0.0	0	0.0	0	0.0
3,500 - 4,000	16	0.1	59,307	3.1	8	0.3	29,566	3.5	7	1.0	25,824	3.8	1	0.0	3,917	1.3	0	0.0	0	0.0
over 4,000	19	0.1	89,024	4.7	9	0.4	39,649	4.7	10	1.5	49,375	7.3	0	0.0	0	0.0	0	0.0	0	0.0
Total	25,658	100.0	1,889,819	100.0	2,465	100.0	836,586	100.0	674	100.0	675,363	100.0	5,996	100.0	307,551	100.0	16,523	100.0	70,319	100.0

Source: Statistical office of the Slovak republic; National Agricultural and Food Centre Branch: Research Institute of Agriculture and Food Economics.

In terms of production importance and rural employment, corporate enterprises are crucial. Out of a total of 3,139, a significant share is represented by trading companies (78.5%), which manage 55.3% of the agricultural land of legal entities. Agricultural cooperatives and state-owned enterprises accounted for 21.5 % of total and managed 44.6 % of the legal entities' land. The periods between the two structural censuses document the growing importance of small family farms, especially in less productive areas of Slovakia, where there are less job opportunities in other sectors. While the numbers of registered natural persons have remained stable, except for small fluctuations, the number of unregistered natural persons has increased. These are mostly small backyard farms with production for own consumption, only in

specific cases production intended for the market.

The average farm size in Slovakia differs significantly from the average farm size in most EU Member States. For legal entities, the average area is approximately 1,287 ha. For all entities, including unregistered ones, the average farm area was 73.65 ha, of which the average area of cultivated land per farm was 79.03 ha. There are almost 16,523 unregistered individuals in Slovakia with very small land area, but their total land size is not significant in terms of production. The average area of legal entities' farms is decreasing and the average area of registered natural persons - self-employed farmers is increasing. This process also has a significant impact on the social structure of the countryside.

Structural survey of farms by region

Between 2016 and 2020, the number of farms increased by 8.9%, both legal (16.5%) and natural (7.9%) persons, to a total of 2,092, which was reflected in most regions, except the Žilina region. However, the highest number was in the Nitra region (an increase of 623 farms).

Significant changes compared to the Structural Census of Farms between 2013 and 2016 also occurred in employment per 100 ha

of agricultural land, especially of legal entities, which decreased on average from 5.6 to 4.7 employees, i.e., by almost 1 employee (Table 5). This can be explained by the decline in agricultural land for other purposes, cost-saving measures, the onset of mechanisation of work activities, but also by lower interest in working in agriculture, given the remuneration and job opportunities in other sectors.

Table 5. Agricultural enterprises according to numbers. area of agricultural land and employment in regions in 2020

Indicator / Region	BA	TT	TN	NR	ZA	BB	PO	KE	SR
1. Legal persons in total									
Number	148	427	236	548	313	608	474	446	3200
Area in ha	63,849	225,397	115,049	327,910	134,095	224,810	217,925	202,913	1,511,949
Number of employees per 100 ha	4.3	5.3	4.9	6.0	4.3	3.7	4.6	4.5	4.7
2. Natural persons in total									
Number	735	2,387	1,400	3,915	3,809	4,238	3,041	2,933	22,458
Area in ha	13,055	40,993	18,738	85,856	29,393	69,678	49,091	71,066	377,870
2.1. Registered natural persons									
Number	186	577	341	871	973	1,268	975	744	5,996
Area in ha	10,386	31,826	13,592	72,214	21,321	56,599	41,046	60,568	307,551
Number of employees per 100 ha	0.6	0.6	0.4	0.8	0.2	0.4	0.4	0.8	0.5
2.2. Unregistered natural persons									
Number	549	1,810	1,059	3,044	2,836	2,970	2,066	2,189	16,523
Area in ha	2,669	9,167	5,147	13,642	8,072	13,079	8,045	10,499	70,319
Legal and natural persons in total									
Number	883	2,814	1,636	4,463	4,122	4,846	3,515	3,379	25,658
Area in ha	76,904	266,390	133,788	413,766	163,488	294,488	267,016	273,979	1,889,819

Legend: BA – Bratislava region, TT – Trnava region, TN – Trenčín region, NR – Nitra region, ZA – Žilina region, BB – Banská Bystrica region, PO – Prešov region, KE – Košice region, SR – Slovak republic

Source: Statistical office of the Slovak republic; National Agricultural and Food Centre Branch: Research Institute of Agriculture and Food Economics.

Agricultural land decreased by 0.62%, a total of 11,795 ha, most in the Bratislava region (20,491 ha) and less in the Košice (11,753 ha) and Žilina (7,069 ha) regions. On the other hand, the area of agricultural land increased most in the Prešov region (11,482 ha), less in the Banská Bystrica region (5,313 ha), the Trenčín region (5,287 ha) and the Nitra Region (5,107 ha). However, the total gain did not compensate for the total loss of land in the Slovak Republic.

Regionally, the western Slovak regions experienced the largest decrease in number of workers, especially legal entities, which can be explained by better job opportunities in

other sectors in this region, as well as accessibility of the Slovak capital. The situation was similar in Žilina region, where the decrease in agricultural land was mainly due to changes related to the establishment of non-agricultural enterprises (automotive industry). In the Bratislava and Košice regions, the decrease in agricultural land was caused by interest in individual construction.

Legal entities

From the results of the Structural Farm Survey of Legal Persons between 2013 and 2020, it can be deduced that in 2020:

-legal persons are the decisive group of producers of agricultural products for the food

industry in Slovakia, they are predominant in terms of production, area of cultivated agricultural land and employment,

-in terms of the breakdown of legal entities, commercial companies (Ltd, JSC) managed 836,586 ha of agricultural land, which was 23.8% more than cooperatives (675,363 ha of agricultural land),

-the number of agricultural enterprises increased by 40.6% (924 enterprises) in almost all regions, with the highest number in the Banská Bystrica (221) and Košice (154) regions, mainly due to the increase in commercial companies,

-the total area of agricultural land in Slovakia decreased by 17,134 ha. The largest decrease was in the Bratislava region (17,006 ha), less in the Žilina (8,702 ha) and Košice (8,222 ha) regions.

This is documented by the significant dispersion of business entities and the segmentation of farms of legal entities was more evident in less productive agricultural areas of Slovakia.

-The decrease in cultivated land of legal entities, especially in the north-eastern regions of Slovakia, was compensated by high increases in cultivated land of registered natural persons in these areas. The decrease in area of large business entities (legal entities) was thus compensated by an increase in cultivated areas of registered natural persons.

-The increase in agricultural land of legal entities occurred in the Nitra region (12,633 ha) and less in the Trnava region (3,739 ha), but this was not sufficient to compensate for the overall decrease:

-significant changes also occurred in employment. The number of employees in relative terms, i.e., per 100 ha of land, decreased from 6.7 in 2010 to 4.7 in 2016.

Natural persons

Registered natural persons

-According to the structural survey, in 2020 up to 5,996 farms were registered as natural persons, their number increased by 11.3% compared to 2013, except for the Bratislava region in all regions, most of them in northern parts of Slovakia, i.e., in the Trenčín, Žilina, Prešov and Banská Bystrica regions, in most of which the cultivated land also increased,

i.e., these are the less productive areas of Slovakia. The average area of cultivated land per farm of registered natural persons was 17.96 ha.

-In productive agricultural areas, the number of registered farms of natural persons almost stagnated. These areas are dominated by legal entities - large farms in terms of area. In all regions of western Slovakia, the area of agricultural land of this group of farms has decreased. In relative terms, i.e., per 100 ha of agricultural land, employment has not changed significantly, with an average decrease of only 0.1 worker.

Unregistered natural persons

In 2020, there were 16,523 farms of unregistered natural persons managing 70,319 ha of agricultural land. The number of unregistered farms has increased by 7.1% since 2016 and agricultural land by 19.8%. These are more or less self-sufficient farms, (households), which are a complementary activity of the rural population, and also represent a certain rural lifestyle in almost all regions of Slovakia, but their significant increase is not expected in the future.

Employment in agriculture and food industry

Agriculture in Slovakia has undergone many changes over the past decades, and this has been reflected in employment. Crop and livestock production have declined, and the number of cooperatives has gradually decreased. During the transition process, many cooperatives have disappeared or have been transformed into trading companies. The restructuring of enterprises and the gradual optimization of cost factors and work procedures have led to considerable unemployment in agriculture. With Slovakia's accession to the EU in 2004 and the adoption of conditions of the single European market, the possibilities of obtaining financial support from EU funds have expanded and the situation has partially stabilised.

Macroeconomic aspects of the socio-economic situation of agriculture and food industry

After 2011, the share of agriculture in the economic performance of Slovakia has had a fluctuating development in individual years.

While in 2011 the share of gross value added of agriculture in the gross value added of the national economy reached 3.20%, in 2020 it was only 2.43%. It peaked in 2017 at 3.38%,

when it also exceeded the level of the base year 2011. This development was also reflected in the social sphere - employment (Table 6).

Table 6. Development of the participation of agri-food sector indicators on the economy (in %)

Indicator/sector	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Agriculture										
on gross value added (current prices)	3.20	2.53	2.07	2.55	2.69	2.99	3.38	2.67	2.69	2.43
on employment	2.47	2.34	2.24	2.18	2.12	2.25	2.15	2.10	2.01	1.96
on average wage	75.92	75.58	75.55	77.86	78.26	75.97	76.11	74.18	76.97	76.42
Production of food, beverages and tobacco products										
on gross value added (current prices)	1.83	1.68	1.61	1.55	1.55	1.41	1.51	1.41	1.40	1.43
on employment	2.24	2.20	2.11	2.05	2.02	1.95	1.89	1.91	1.93	1.96
on average wage	91.04	91.45	90.77	89.19	90.09	88.93	89.83	89.01	89.64	88.08

Source: Statistical office of the Slovak republic; National Agricultural and Food Centre Branch: Research Institute of Agriculture and Food Economics.

In addition to its national importance, agriculture in the Slovak countryside has in the past fulfilled an important social function, especially in terms of employment. It was the main employer and often the only one in rural areas. A significant decline in the workforce occurred in the early years of the agricultural transformation and later because of technological progress under subsidy support from the Rural Development Plan 2007-2013. Although the rate of reduction in employment has slowed down in recent years, the share of average number of registered employees in agriculture in the total number of employees in the national economy has decreased from 12.00 % in 1990 to 1.96 % in 2020. Since 2011, the share of agricultural employment in

total employment in the country has ranged from 1.96% to 2.47%. The development of employment in agriculture since 2011 has been variable, with a gradual slight decrease from 55.6 thousand in 2011 to 46.6 thousand in 2020 (16.2%). There has been a slight stabilization of employment in the last two years (Table 7).

Compared to other sectors of the national economy, the remuneration of employees in agriculture is still lower. According to average monthly wages, agricultural workers are among the most socially disadvantaged group of employees, with a tendency towards a significant deterioration in their income status. Average wages in agriculture have been at 74 % of the national average for a long time.

Table 7. Development of employment in agriculture and food industry (in thousands of persons)

Sector	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Agriculture, forestry and fisheries	81.8	77.6	73.1	73.0	70.6	73.9	72.4	73.4	72.5	72.3
- out of which agriculture	55.6	51.5	48.6	48.1	46.8	49.2	47.7	47.7	46.7	46.6
Production of food, beverages and tobacco products	43.6	41.9	39.9	39.8	38.6	37.1	36.9	38.2	39.7	41.0

Source: Statistical office of the Slovak Republic.

The contribution of the food industry to the gross value added of the national economy is lower than that of agriculture. The macroeconomic situation in the food sector has been more stable after 2008, although its

trend in value added as a share of the national economy has been degressive, from 1.83% in 2008 to 1.43% in 2017. The decline in the share has been continuous and has taken place gradually every year since 2011. This trend

has continued until now, due to the liberalization of trade, the pressure exerted by retail chains on their suppliers and the high import of food products that can be produced in Slovakia. This resulted in a decrease in food production in individual sectors and an increase in imports of finished foreign products. On the other hand, the low competitiveness of Slovak products on the domestic and foreign markets is reflected in the high negative balance of foreign trade in food products.

This trend subsequently also affected employment, as the share of employment in the food industry in the national economy fell from 2.24% in 2011 to 1.96% in 2020. Although the number of employees decreased between 2011 and 2020 (6.0%), employment

in the food industry had a more moderate decline than in agriculture, from 43.6 thousand in 2011 to 43.6 thousand in 2020. The remuneration of workers in the food industry was higher than in agriculture by about 15-20% and the share of the average wage in this sector reached almost 90% of the average wage in the national economy.

Development of the structure of agricultural workers in terms of status

In terms of status of persons in agriculture, employees accounted for a decisive share of the total number of workers in agriculture (Table 8). The steady to slightly increasing share of entrepreneurs, except for 2015 and 2016, confirms the established trend, with an annual increase of 5.8% in 2017.

Table 8. Development of agricultural workers structure in terms of status (in %)

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Employees	91.9	89.8	88.1	86.4	92.4	93.5	87.7	86.6	88.8	87.4
Entrepreneurs	8.1	10.2	11.9	13.6	7.6	6.5	12.3	13.4	11.2	12.6

Source: Statistical office of the Slovak Republic.

Educational structure of agricultural workers

The educational level in agriculture has improved since 2011 and is currently characterised by two equal groups (Table 9),

i.e., secondary education, with the share of workers falling from 55.8% (2011) to 41% (2020, vocational education), and complete secondary education, with the share rising from 23.4% (2011) to 42% (2020).

Table 9. Development of educational level of agricultural workers (in thousands of persons)

Education/year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Index 2020/2011	Index 2020/Ø2011-2019
Primary education	10.4	9.6	6.5	5.2	5.3	4.6	4.7	4.8	2.8	2.3	22.1	38.4
Secondary education (vocational)	39.6	35.6	28.8	25.8	28.8	24.8	25.5	26.1	25.8	19.9	50.3	68.7
Complete secondary education	16.6	15.4	16.5	14.9	17.3	18.6	22.9	21.8	20.4	20.4	122.9	111.7
University education	4.4	4.9	4.5	5.4	3.9	4.9	5.6	5.3	3.6	5.9	134.1	124.9
Total	71.0	65.5	56.3	51.3	55.3	52.9	58.7	58.0	52.6	48.5	68.3	83.7

Source: Statistical office of the Slovak republic; National Agricultural and Food Centre Branch: Research Institute of Agriculture and Food Economics.

Low-skilled and marginalised groups of workers have found employment mainly in specialized production areas. The increasing efficiency of the production process results from the growing pressure of the market environment and has also been carried out through the minimisation of manual labour using of modern, innovative technologies. This trend places higher demands on the

technical skills required to operate the equipment in production as well as on the managerial skills of managers of individual farm managers.

Evolution of the structure of workers in the food industry in terms of status, age and education

In terms of employment status, employees account for a decisive share of the total

number of workers in the food industry (Table 10), accounting for 96.2% in 2020. The share of entrepreneurs ranged from 2.7%-7.6% between 2011-2020 and reached 3.6% in 2020. The development of the share of

entrepreneurs varied significantly, while the share in the number of employees was more stable. The share of entrepreneurs fluctuated significantly in 4-5-year intervals. The highest decline occurred in 2016 and 2020.

Table 10. Development of food production workers structure in terms of status (in %)

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Employees	97.5	96.2	95.8	92.2	93.8	96.7	96.0	93.3	92.5	96.2
Entrepreneurs	2.7	3.8	4.2	7.6	5.6	2.8	4.2	6.5	7.4	3.6

Source: Statistical office of the Slovak Republic.

Development of the educational structure in the food industry

In terms of educational level in the food industry in 2020, the largest share of workers in 2020 had a complete secondary vocational education (36.4%) and a secondary vocational education without graduation exam (34.3%). These two educational groups dominate the

shares of long-term workers, but education without graduation exam was predominant (Table 11).

The share of workers with primary education reached 5.1% in 2020 and the share of those with a university degree reached 10.3%, both groups with continuous growth over the last three years.

Table 11. Development of educational level of food production workers (in %)

Education/year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Primary education	6.6	4.7	5.1	5.8	5.1	6.4	2.4	2.8	3.1	5.1
Secondary vocational education without graduation exam	46.5	47.9	47.0	45.4	46.8	39.5	45.8	45.4	41.0	34.3
Complete secondary education - vocational education with graduation exam	7.5	6.0	7.3	4.2	3.7	5.7	7.0	5.6	6.8	7.3
Complete general secondary education	3.0	2.3	2.8	5.3	5.8	2.9	2.8	3.2	4.8	3.6
Complete secondary vocational education	30.9	33.1	31.1	29.0	30.3	36.4	31.7	34.8	33.1	36.4
Higher vocational education	0.2	0.3	0.8	0.2	-	0.2	0.4	-	-	0.6
University education – bachelor's degree	0.2	0.7	0.2	0.7	1.0	0.7	1.4	0.7	1.3	2.2
University education – master's degree	5.2	5.0	5.7	9.4	7.3	8.2	8.6	7.5	9.2	10.3
Total	6.6	4.7	5.1	5.8	5.1	6.4	2.4	2.8	3.1	5.1

Source: Statistical office of the Slovak republic; National Agricultural and Food Centre Branch: Research Institute of Agriculture and Food Economics.

CONCLUSIONS

The sustainability of economic life in rural areas is largely influenced by the presence of agriculture and its productive performance. There are significant regional differences in this field. In the most agriculturally productive regions, agricultural activity generates a significant share of employment and the rural economy. In other areas, particularly in heavily industrialised areas, agriculture is a complementary element in the

use of available productive resources, especially labour. Future employment prospects in agriculture will thus depend on an increase in the productive efficiency of agriculture, the intensity of modernisation of the sector, the improvement of the quality of the workforce and the diversified use of the internal development potential of the rural economy.

Slovakia is dominated by rural areas, an integral part of which is agriculture and its associated productive efficiency, which as one

of the key elements influences the economic and social level of its inhabitants. Agricultural land occupies almost half of the entire territory (48.6 %), arable land accounts for 28.8 % of the territory.

In Slovakia, there were 25,658 farms of legal and natural persons managing 1,889,819 ha of agricultural land in 2020. In terms of numbers, the majority group consisted of natural persons' enterprises, both registered and unregistered, with a share of 87.8 %, and the minority group consisted of legal persons' enterprises with a share of 12.2 %

In terms of size of the cultivated land, the situation was reversed, with 80.0% of agricultural land being cultivated by legal entities and approximately 20% by natural persons.

The average area of farms in Slovakia for all entities, including unregistered ones, is 73.65 ha. In the case of legal entities, it is 1,287 ha. The economically and productively decisive part of the enterprises is made up of legal entities with a large-scale production character, with a predominance of rented land and with a low degree of diversification of activities beyond agriculture. There were 16,523 unregistered individuals with a very small area of land, but their total land size is not significant in terms of production.

Regionally, the western Slovak regions experienced the largest decrease in number of workers, especially legal entities, which can be explained by better job opportunities in other sectors in this region, as well as accessibility of the Slovak capital. The situation was similar in Žilina region, where the decrease in agricultural land was mainly due to changes related to the establishment of non-agricultural enterprises (automotive industry). In the Bratislava and Košice regions, the decrease in agricultural land was caused by interest in individual construction. The number of persons employed in agriculture was 46.46 thousand and the remuneration of employees was lower than in other sectors of the national economy. In terms of status, employees account for 87.4% and entrepreneurs 12.6%.

REFERENCES

- [1]Buchta, S., 2016, Problémy dátových zdrojov pri analýzach pracovných síl v poľnohospodárstve. *Ekonomika poľnohospodárstva* (Data source problems in agricultural labour force analyses. *Agricultural Economics*), Vol. 16, (4), 35-44.
- [2]Cai, C.Z., Zhang, R.D., 2010. Empirical analysis on the main influencing factors of increasing farmers' income in Guizhou, *Journal of Guizhou University of Finance and Economics*, Vol. 3, 104–109.
- [3]Chrastinová, Z., 2019, Dopad podporných nástrojov SPP EÚ na ekonomickú efektívnosť poľnohospodárstva a potravinárstva SR a synergia dopadov agrárnych politík v komplexe ekonomických, sociálnych a environmentálnych funkcií poľnohospodárstva. Štúdia č. 202/2019 (The impact of EU CAP support instruments on the economic efficiency of agriculture and food production in the Slovak Republic and the synergy of the impacts of agricultural policies in the complex of economic, social and environmental functions of agriculture. Study No. 202/2019). <https://www.mpsr.sk/dopad-podpornych-nastrojov-spp-eu-na-ekonomicku-efektivnost-polnohospodarstva-a-potravinarstva-sr-a-synergia-dopadov-agrarnych-politik-v-komplexe-ekonomickych-socialnych-a-environmentalnych-funkcii-po/1585-242-1585-17936/>, Accessed on 11 December 2024.
- [4]Developments in the income situation of the EU agricultural sector. (2010), Brussels: European Commission, DGAGRI, 60 pp. https://commission.europa.eu/index_en, Accessed on 11 December 2024.
- [5]Grznár, M., 2013, Investičné procesy a konkurenčná schopnosť poľnohospodárskych podnikov. *Ekonomika poľnohospodárstva* (Investment processes and competitiveness of agricultural enterprises. *Agricultural economics*), Vol. 13, (1), 23-35.
- [6]Li, X.L., Zheng, W., 2016, Review on the theory, empirical and countermeasures of farmers' income influence factors, *China Journal of Agricultural Resources and Regional Planning*, Vol. 5, 90–95.
- [7]Liu, H.K., He, C., Cui, H.T., 2017, Mechanism analysis and empirical testing of rural labour force transfer to reduce poverty, *Rural economy*, Vol. 11 (1) 57–62.
- [8]Luo, D., Jiao, J., 2014. An empirical study on the impact of national financial support for agriculture funds on farmers' income, *Issues in Agricultural Economy*, Vol. 35 (6), 48–53.

- [9]Mei, X.X., Liu, Y. L., 2016, Labor Mobility, rural Per Capital Wage Income and Urban-Rural Income Gap, *Journal of Chongqing University (Social Science Edition)*, Vol. 17 (1). 42–53.
- [10]Mezera, J., Plášil, M., Náglová, Z., 2021, Panorama potravinárského průmyslu 2020 (Food industry panorama 2020). <https://mze.gov.cz/public/portal/mze/potravinny/publikace-a-dokumenty/publikace/panorama-potravinarskeho-prumyslu>, Accessed on 11 December 2024.
- [11]Valach, M., 2018, Social function of agriculture sector in the Slovak Republic. *Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development"*, Vol. 18(3), 475-482. https://managementjournal.usamv.ro/pdf/vol.18_3/Art60.pdf, Accessed on 6 January 2025.
- [12]Valach, M., 2021, Support of agricultural sector in the Slovak Republic. *Scientific Papers. Series "Management, Economic Engineering in Agriculture and rural development"*, Vol. 21(1), 793-804. https://managementjournal.usamv.ro/pdf/vol.21_1/Art90.pdf, Accessed on 11 December 2024.
- [13]Zhang, D.P., Liu, D.P., 2002. Quantitative analysis of the impact of agricultural product market fluctuations on farmers' income, *Issues in Agricultural Economy*, Vol. 6, 34–37.