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ANALYSIS OF THE AGRICULTURAL LABOUR FORCE IN TERMS OF THE AREA CULTIVATED WITH THE MAIN CROPS IN ROMANIA, DURING THE PERIOD 2018-2022

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Abstract

At a time when expert analysts states that one of the main reasons why Romanian agriculture has been going through a major crisis for more than a decade is the labor crisis in agriculture, this article will examine the evolution of the areas cultivated with major crops and of the agricultural labor force from 2018 to 2022. The study will cover the entire country, the 8 development regions, and the 7 counties within the South-Muntenia development region, also indicating the total area under main crops per person employed in agriculture during the reference period. To create this article, statistical data have been analyzed using the data from the National Institute of Statistics of Romania, TEMPO Online database, and using both descriptive and inferential statistics. In the year 2022, the area cultivated with the main crops in Romania slightly exceeded 8 million hectares. In the same year, out of 7.8 million people with an income-generating occupation, only about 11% of these people had an occupation in agriculture, thus a person employed in agriculture had a little over 9 ha of the total cultivated area with the main cultures.

Key words**:** *labor force, cultivated area, evolution, ha/person.*

INTRODUCTION

The historical beginnings of agriculture date back to about 8,500 BC, when the inhabitants of the Middle East set a historical precedent when, instead of gathering from the wild, they began to grow grains for their own consumption. The early development of agriculture played a particularly important role in the development of close-knit local communities, villages, towns and countries as we know them today due to the fact that about 1500 years after humans began to cultivate grains at the expense of gathering them from wilderness, they began to put aside the nomadic lifestyle they had, starting to domesticate animals and therefore being forced to continue their existence established in one place, thus putting an end to a stage of long and arduous journeys aimed at finding wild animals and grains to provide them with the minimum food required for survival, thus giving the start to civilization as we know it today [23].

Ever since humans began to grow plants and raise animals for food, they have dedicated themselves to these activities and with the development of the agricultural sector human labor has become indispensable for its development. The reviving of rural communities can be done by practicing efficient agriculture, which means, equally, a better life for farmers and the village world, food security for all citizens, more legitimacy and competitiveness between the states of the European Union [7].

However, although for previous generations working the land and raising animals were daily occupations without which humans could not imagine their existence, with the emergence of intensive agriculture and the development of large industries, for ordinary

people agriculture has taken a back seat, their interest regarding physical labor involved in working in agriculture decreasing, being more interested in intellectual work and working with their minds, reason for which the number of persons working in agriculture has been in decline for the last decades and which, according to the exports in the field, will continue to drop at the European union level with about 28% until 2030 [12]. Since 2020, Romania has been ranked seventh among European Union members in terms of the state's contribution to its agricultural industry's total production. This metric encompasses both agricultural output and related non-agricultural activities. Despite this ranking, Romania's extensive cultivated land and high yields continue to establish it as a significant player in agriculture within the European Union [24]. Although from a statistical point of view Romania has some of the best statistics in the European Union, 57% of the total area of the country being represented by the area used for agriculture, 23% of the workforce being employed in agriculture [6], the agricultural workforce in Romania follows the same downward trend present in the whole European Union, mainly due to the lack of interest of young people in agriculture and their migration from rural to urban areas or to other countries in search of a better living, as well as the ageing of the population employed in agriculture, over 44% of all farmers aged over 65 years in the European Union being active in Romania [6]. Echoing the previous point, many Romanians, in their ongoing search for a better life and higher-paying jobs, frequently migrate abroad, often bringing their entire families with them [5]. Given that agriculture has always been a fundamental element essential for human survival and significantly contributing to the development of civilization, it is crucial to analyze the agricultural workforce in relation to the area cultivated with major crops. This paper will undertake such an analysis. As a vital component of the global food chain, agriculture faces significant challenges due to climate change and the growing demand for food. In this evolving landscape, the concept of sustainability is increasingly important, representing not only a goal but also a collective responsibility for everyone involved in agricultural activities. [2]. To provide a cleaner understanding, this analysis will cover the period from 2018 to 2022 and it will begin with an overview of national statistical data, followed by an analysis of the 8 development regions, and conclude with a detailed examination of the 7 counties in the South-Muntenia development region.

MATERIALS AND METHODS

Building on the premise that probability forms the foundation of statistics, Sheldon M. Ross, a distinguished professor at the USC Viterbi School of Engineering and an author of numerous books on probability, asserts that *"statistics is the art of learning from data."* According to Ross, statistics involves drawing conclusions based on the description and analysis of collected data [11], this paper will analyze statistical data downloaded from the official website of the National Institute of Statistics of Romania, from the Tempo Online database, using both descriptive and inferential statistics [15]. Basically, the descriptive statistics part, being the component of statistics that deals with the description and synthesis of data [19], thus with the collection and synthesis of data, is downloaded from the NSI Romania website and inferential statistics, being the part of statistics that is responsible for formulating conclusions based on the analyzed data [19] will contribute to this work because through this branch of it, statistical data will be analysed, identifying the general trend that the reviewed data know in the analysed time period, by identifying the means, medians, standard deviation and coefficient of variation. Forecasting of the analysed data after the end of the analysis period will also be carried out using the method whereby a continuous function is determined for values outside a range of known values [16].

RESULTS AND DISCUSSIONS

The pronounced decline of the population due to its aging, the decrease in fertility and the

presence of migration are demographic phenomen registered in all developed countries [22].

After 1970, the presumption of regional development in stages emerged in Romania, according to which the organization of the national economy evolves in stages, and a progressive evolution is necessary to obtain a balanced spatial structure, first national development would be polarized then integrated, then development would be concentrated in development centers then diffused to the periphery, and finally to the advantage of the peripheries there should be a progressive decentralization within urban units [1]. Subsequently, in 1998, the institutional framework, objectives, competencies, and specific instruments for regional development policy in Romania were established [13]. The promulgation of this law followed the initiation of a regional development program between the European Union and the Romanian Government in the framework of PHARE, a program whose main purpose was to prepare a set of fundamental principles for the development of regional policy in Romania, a program aimed at demonstrating that a properly designed and implemented regional policy will not only help the less developed regions but will also represent an advantage for Romania's overall socio-economic development, project presented through the Green Paper [3]. The objectives of the regional development policy proposed by the Interministerial Working Group included in the Green Paper were primarily to prepare the Romanian state for EU integration and to make Romania eligible for aid from the EU Structural Funds, secondly, to reduce regional disparities between different regions in Romania, and last but not least in order to achieve a higher level of development of the regions, the integration of public sector activities [3].

The administrative structure in Romania at that time, which consisted of 42 counties (including their towns and municipalities), was not suitable for developing an effective rural development policy, so the Green Paper proposed an administrative structuring of Romania into smaller administrative territorial units, while maintaining the existing number of counties, but grouping them into eight macro-regions of development taking into account economic and social profiles, functional relations, specific problems, etc [3].

Following the implementation of Regulation (EC) No 1059/2003 of the European Parliament and of the Council, which established a common classification of territorial units for statistics (NUTS) and was published in May 2003 which aimed to establish a common classification of territorial units in order to facilitate the collection, compilation and dissemination of harmonized regional statistics within the European Community [18], in 2004, a new law on regional development in Romania has been enacted to align with the objectives of the aforementioned Regulation, namely Law 315/2004.

In the annex of law 315/2004, the composition of the development regions in Romania was named and established, as it follows:

- North-East Development Region - comprising Bacău, Botoșani, Iași, Neamț, Suceava, and Vaslui counties.
- South-East Development Region - comprising the counties of Braila, Buzau, Constanta, Galati, Vrancea and Tulcea.
- South-Muntenia Development Region - comprising Argeș, Călărași, Dâmbovița, Giurgiu, Ialomița, Prahova and Teleorman counties.
- South-West Oltenia Development Region - comprising Dolj, Gorj, Mehedinți, Olt and Valcea counties.
- West Development Region - comprising the counties of Arad, Caras-Severin, Hunedoara and Timis.
- North-West Development Region - comprising Bihor, Bistrita-Nasaud, Cluj, Sălaj, Satu Mare and Maramureș counties.
- Centru Development Region - comprising Alba, Brasov, Covasna, Harghita, Mures and Sibiu counties.
- Bucharest-Ilfov Development Region, in which Bucharest municipality and Ilfov county are comprised [14].

The 8 development regions comprise the territories of the counties that make them up,

respectively the territory of Bucharest municipality, however they do not have legal personality and are not considered administrative-territorial units, being classified, according to the average size in terms of population, in the NUTS 2 class [21].
As mentioned earlier, 57% of Romania's total land area is used for agriculture, according to Romania's CAP strategic plan approved by the European Commission in December 2022 [6].
However, although the area used for agricultural purposes is one of the largest in the European Union, the polarized structure of Romania's agriculture, with the largest area of land divided into small plots [4], and land used for its own consumption [17], hinders the authorities' efforts to enhance the natural advantage Romania enjoys compared to other EU Member States.

Table 1. Trends in cultivated areas for major crops in Romania and its development regions (2018-2022)

	2022/2018 -%-	2022/2019 -%-	2022/2020 -%-	2022/2021 -%-	2030/2022 -%- forecast
ROMANIA	-5.44	-8.37	-3.12	-3.12	-12.32
NORTH-WEST Region	-2.89	-4.18	-2.55	-3.87	-4.35
CENTRE Region	-6.83	-5.39	-2.28	-2.81	-12.42
NORTH-EAST Region	5.70	0.07	1.61	-0.52	7.80
SOUTH-EAST Region	-8.79	-6.94	-5.11	-8.26	-12.28
SOUTH-MUNTENIA Region	-1.43	-2.52	-0.30	0.62	-4.32
BUCHAREST-ILFOV Region	-7.29	-2.53	-0.58	-16.16	0.62
SOUTH-WEST OLTENIA Region	-5.29	-8.60	-5.94	-4.31	-11.21
WEST Region	-22.16	-34.05	-9.74	-0.95	-87.50

Source: National Institute of Statistics- Tempo-Online [10]. Accessed on April 2, 2024.

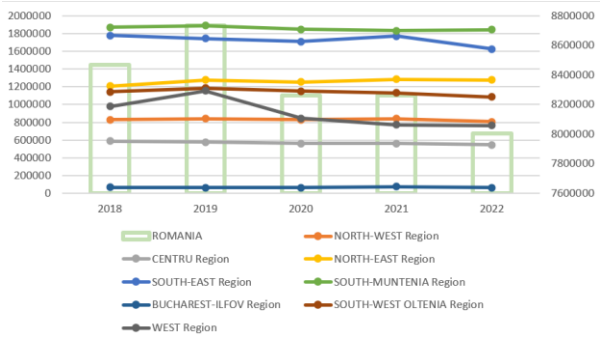
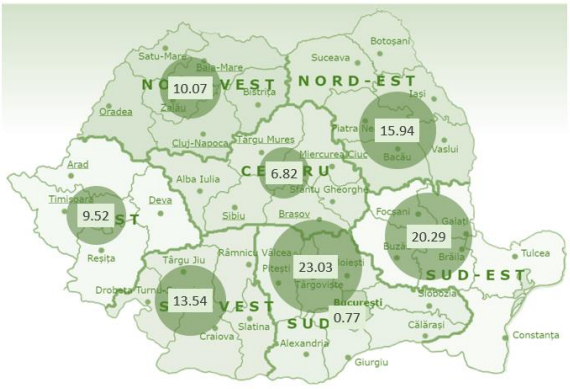


Fig. 1. The changes in the area under cultivation for major crops at both the national level and within Romania's development regions during the period 2018-2022
Source: National Institute of Statistics- Tempo-Online [10] Accessed on April 2, 2024.

An analysis of data from the National Institute of Statistics database reveals a consistent downward trend in the cultivation areas of major crops at the national level over the entire period studied. This trend persisted, resulting in the cultivation area of major crops in 2022 being lower than in any of the previous years analysed (Figure 1).
Although in 2019 compared to 2018 the value of the area increased by 3.19% and in 2021 compared to 2020 by only 155 hectares, an insignificant percentage increase, the decreases recorded in 2020 compared to 2019 of 5.4% and in 2022 compared to 2021 of 3.1% have led to the determination of a gloomy forecast, i.e. if in the next 8 years the values would know the same evolution, the cultivation area of major crops may experience a decrease of 12% compared to 2022 and nearly 18% compared to 2018 (Table 1).



Map 1. Proportion of land allocated to primary crop cultivation in Romania's development regions in 2022
Source: National Institute of Statistics- Tempo-Online [10], Accessed on April 2, 2024.

The projected outlook for 2030 regarding the cultivation area of primary crops across the 8 development regions is also concerning. Positive values have been determined for only two regions: North-East and Bucharest-Ilfov, which have recorded the lowest values of cultivated areas with the main crops throughout the entire reference period.
Over the five years analyzed, the regions whose area decreased the most at the end of the reference period compared to the beginning of it were the Bucharest-Ilfov region (decrease of 7.3%), the South-East region (decrease of 8.8%) and the West region, which recorded a record decrease of 22% in the area under main crops.

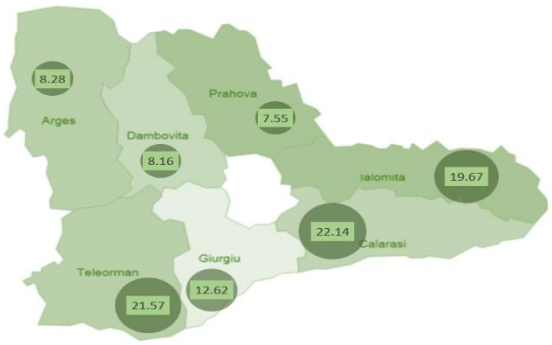
Except for the North-East region, where the cultivation area of main crops consistently increased over the reviewed period (rising by 5.7% in 2022 compared to 2018), the analysed indicator declined across all other regions. Specifically, the average annual decline in cultivated areas was 3.4% in the North-West region, 4.2% in the Centre region, 7.3% in the South-East region, nearly 1% in the South-Muntenia region, 6.6% in the Bucharest-Ilfov region, 6% in the South-West Oltenia region, and 16.7% in the West region.

Table 2. Shifts in Cultivation areas of primary crops in the South-Muntenia development region (2018-2022)

	2022/2018 -%-	2022/2019 -%-	2022/2020 -%-	2022/2021 -%-	2030/2022 -%- forecast
SOUTH-MUNTENIA Region	-1.43	-2.52	-0.3	0.62	-5.36
Arges	0.02	-3.96	-0.36	-0.16	-3
Calarasi	-0.35	-0.49	5.59	1.21	-3.52
Dambovita	-8.68	-8.75	-2.84	1.41	-25.86
Giurgiu	-3.26	-6.96	-8.91	-2.74	-6.7
Ialomita	4.18	4.09	5.34	-1	10.56
Prahova	-2.18	-2.56	-0.88	2.13	-8.45
Teleorman	-3.54	-4.36	-4.03	3.11	-13.03

Source: National Institute of Statistics- Tempo-Online [10], Accessed on April 2, 2024.

When examining the data for the South-Muntenia development region, a similar downward trend is evident, although the declines in the cultivated area for primary crops in this region are not particularly alarming (Map 2).



Map 2. Proportion of land allocated to primary crops cultivation in the counties within the South-Muntenia development region in 2022
Source: National Institute of Statistics- Tempo-Online [10], Accessed on April 4, 2024.

Over the initial four years analyzed, there was an average decrease of 0.7%, and in the fifth year, there was a marginal increase of less than 1% compared to the preceding year.
Projections for this region indicate a negative forecast, with an estimated reduction of slightly over 5% in the cultivated area for primary crops by 2030.
Analyzing the counties within the South-Muntenia development region and considering the cultivation area of primary crops over the same period reveals a fluctuating pattern.
The area values exhibit numerous instances of both increases and decreases in the analyzed indicator throughout the reference period.
By the end of the analyzed period, 5 out of the 7 counties in the South-Muntenia region experienced a decline in the cultivated area for major crops compared to the beginning of the period, the most affected being Dâmbovita county (decrease of 8.7%), Giurgiu, Prahova and Teleorman counties experienced decreases between 2.2% and 3.5%, Calarasi county recorded the smallest decrease in the area under main crops (0.35%), meanwhile Arges and Ialomita counties recorded increases of 24 hectares (not significant in percentage terms) in Arges county and just over 4% in Ialomița county.
Due to fluctuations in the values recorded over the 5 years analyzed, a decrease of 0.35%/year a change in the cultivated area for primary crops was documented in the South-Muntenia development region. The resulting averages within each county of the South-Muntenia region are decrease of 2.2%/year in Dâmbovița County, 0.82%/year in Teleorman county, 0.53%/year in Prahova County, 0.74%/year in Giurgiu county and 0.02%/year in Călărași county, and in Argeș and Ialomița counties increases of 0.04%/year and 1.08%/year respectively.

Table 3. Shifts in the agricultural workforce at the national level and within Romania's development regions from 2018 to 2022

	2019/2018	2020/2019	2021/2020	2022/2021	2022/2018
ROMANIA	-0.71	-3.77	-49.65	1.45	-51.19
NORTH-WEST Region	-0.72	-3.7	-50.4	1.44	-51.89
CENTRE Region	-0.56	-3.79	-48.5	1.49	-50
NORTH-EAST Region	-0.79	-3.92	-50.82	1.33	-52.5
SOUTH-EAST Region	-0.83	-3.88	-48.96	1.79	-50.48
SOUTH-MUNTENIA Region	-0.78	-3.67	-49.41	1.34	-50.99
BUCHAREST-ILFOV Region	-1.08	-2.91	-43.82	2.67	-44.6
SOUTH-WEST OLTENIA Region	-0.63	-3.63	-50.98	1.61	-52.31
WEST Region	-0.4	-3.91	-47.51	0.93	-49.3

Source: National Institute of Statistics- Tempo-Online [10], Accessed on April 2, 2024.

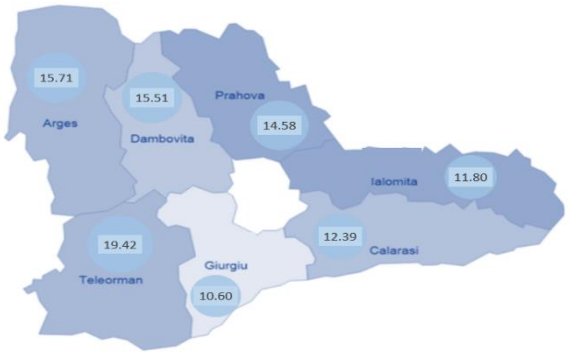
Map 3. The agricultural workforce in Romania's development regions in 2022
Source: National Institute of Statistics- Tempo-Online [10], Accessed on April 2, 2024.

The statistical data analysis sourced from the NSI platform validates analysts' assertions regarding the decline in the agricultural labor force [9]. The data scrutinized over the 5-year period indicate that by the end of the analysis, compared to the outset, the employment figures in agriculture nearly halved both nationally and across the 8 development regions. Although in the first three years analyzed the resulting trend is slightly descendent, from 2020 to 2021 there was a significant decrease in the indicator analyzed, the largest decrease being recorded in the South-West Oltenia region (50.98%) and the smallest in the Bucharest-Ilfov region (43.82%). Despite minor increases in the analyzed indicator during the final year of the period, ranging from 2.67% in the Bucharest-Ilfov region to 0.93% in the West region, these changes did not significantly affect the overall results from the beginning to the end of the period. The overall trend remained downward, with the Bucharest-Ilfov and West regions seeing declines of just under 50%, and the Centre, South-East, and South-Muntenia regions experiencing an exact 50% decrease, while the North-West, North-East, and South-West Oltenia regions saw declines just over 50%. At national level, the same downward trend has been identified, with the values of the analyzed indicator decreasing from 2018 to the end of 2022 by 51%.
In 2022, the North-East region had the highest share of agricultural labor force (19.5% of the national total) and the lowest in the Bucharest-Ilfov region (1.79%).

Table 4. Trends in the agricultural workforce in the South-Muntenia development region (2018-2022)

	2019/2018	2020/2019	2021/2020	2022/2021	2022/2018
SOUTH-MUNTENIA Region	-0.78	-3.67	-49.41	1.34	-50.99
Arges	-1	-3.85	-50.63	1.28	-52.41
Calarasi	-0.83	-3.63	-46.67	1.63	-48.2
Dambovita	-1.01	-3.46	-51.58	1.74	-52.92
Giurgiu	-0.6	-3.65	-49.84	0.63	-51.66
Ialomita	-0.6	-3.63	-45.14	1.71	-46.55
Prahova	-0.66	-3.56	-49.88	1.38	-51.33
Teleorman	-0.66	-3.81	-50	1.03	-51.73

Source: National Institute of Statistics- Tempo-Online [10], Accessed on April 2, 2024.



Map 4. The agricultural workforce in the counties of the South-Muntenia development region in 2022
Source: National Institute of Statistics- TEMPO-Online [10], Accessed on April 2, 2024.

In 2022, most individuals working in agriculture in the South-Muntenia region were in Teleorman county (19.42% of the region's total), while the fewest were in Ialomita county (11.8%). However, with the largest difference among the seven counties being just 7.6%, it can be concluded that the agricultural workforce is evenly distributed across the region. In the South-Muntenia development region and its constituent counties, a trend similar to that observed at the national level and across the eight development regions was noted over the analysed period, the same downward trend has resulted, following the same evolution in the 5 years analyzed, registering a significant decrease in the first years analyzed, followed by a drastic decrease from 2020 to 2021, with a slight increase in the last year analyzed. From the beginning to the end of the analyzed period, within the South-Muntenia region, the agricultural labor force decreased by almost 51%, as decreases of between 46.5% (Ialomița county) and 52.92% (Dâmbovița County) were recorded in each of the 7 component counties.

The decline in the agricultural workforce observed at the three levels examined in this article—national, across the eight development regions, and within the seven constituent counties of the South-Muntenia development region—is attributed to the advanced age of workers employed in the agricultural sector, the low level of professional training of agricultural workers [8] and the migration of romanian agricultural workers to other European countries that are offering more attractive salaries [25] [7]. Although for the first time after the Revolution of 1989 agricultural wages in Romania began to compete with wages in more developed countries, the level of the average wage in agriculture at national level is still half of the minimum wage in agriculture in the European Union. However, although more and more farmers are offering more than attractive salaries in relation to the national agricultural wage, they also require an appropriate level of professional training, which most workers employed in agriculture do not have, either because of a lack of education due to old age or because agriculture is not a top preference for young people [20].

Analyzing the data on the area under main crops and the agricultural labor force further helps us to determine the ratio between these two indicators to determine how many hectares of land under main crops a person employed in agriculture is entitled to, during the analysis period and how this ratio has evolved.

Table 5. Ratio of agricultural labor force to cultivated area of primary crops in Romania and its development regions (2018-2022) (ha/person)

	2018	2019	2020	2021	2022	Forecast 2027
ROMANIA	4.81	5.00	4.92	9.76	9.32	16.41
NORTH-WEST Region	3.14	3.21	3.27	6.69	6.34	11.45
CENTRE Region	3.30	3.27	3.29	6.42	6.15	10.68
NORTH-EAST Region	3.42	3.65	3.74	7.76	7.62	13.99
SOUTH-EAST Region	7.38	7.29	7.44	15.07	13.58	24.29
SOUTH-MUNTENIA Region	6.08	6.19	6.29	12.31	12.22	21.50
BUCHAREST-ILFOV Region	2.40	2.31	2.33	4.93	4.02	7.30
SOUTH-WEST OLTENIA Region	4.80	5.00	5.04	10.12	9.53	17.10
WEST Region	6.57	7.78	5.92	10.27	10.08	14.79

Source: National Institute of Statistics- TEMPO-Online [10], accessing and processing data-04.2024.

The analysis of data on the cultivation area of primary crops and the agricultural workforce shows that the ratio between these two indicators mirrors the overall downward trend observed during the analysed period. This trend is primarily driven by the decline in the agricultural workforce, which directly affects this ratio.

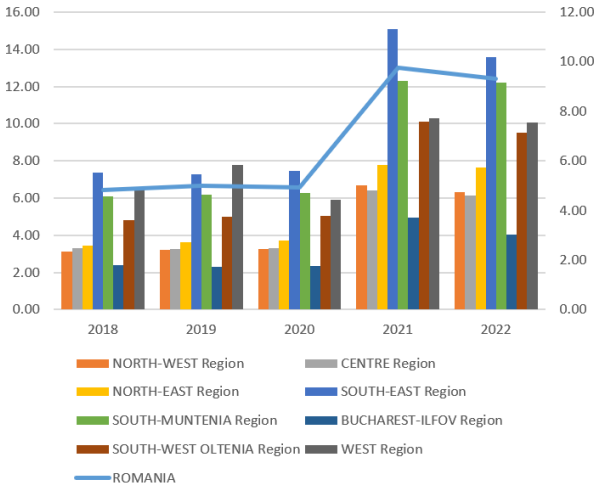


Fig. 2 The Ratio of Agricultural Labor Force to Cultivated Area of Primary Crops at the National Level and Across Romania's Development Regions (2018-2022) (ha/person)
Source: National Institute of Statistics- Tempo-Online [10], Accessed on April 2, 2024.

In both the national context and across Romania's 8 development regions, a pattern marked by fluctuations was observed over the 5-year analyzed period. In the initial years of the period, the resulting ratio exhibited minor fluctuations, averaging 4.64 ha/person in 2018, 4.84 ha/person in 2019, and 4.66 ha/person in 2020 across the 8 development regions, but in the last two years of the analyzed period the same average almost doubled in the penultimate year reaching a value equal to 9.2 ha/pers., and finally in the last year analyzed it decreased very little reaching an average equal to 8.69 ha/pers.

Each of the 8 development regions experienced downward slopes over the analysis period, with the values of the ratio being similar in the first three years analyzed, then roughly doubling in the fourth year and decreasing insignificantly in the last year analyzed. According to the data analyzed, the Bucharest-Ilfov region had the lowest ratio, with one person working in agriculture having the lowest number of hectares, the average over the analysis period being 3.2 ha/person, an intuitive result given that the same region

has the smallest area cultivated with the main crops, but also the smallest workforce in agriculture. Conversely, the South-West region stands out with the highest number of hectares per person employed in agriculture, averaging 10.15 ha per person over the reference period.

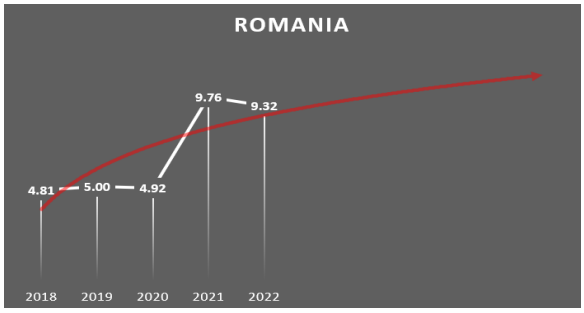


Fig. 3. Predictions for the agricultural labor force relative to the cultivated area of primary crops in Romania (ha/pers)
Source: National Institute of Statistics- TEMPO-Online [10], Accessed on April 2, 2024.

On a nationwide scale, at the start of the analyzed period, each agricultural worker was allocated nearly 5 hectares, while by the end of the period, this allocation had increased by almost 94%, the average for the total analyzed period being equal to 6.76 ha/pers., with a standard deviation of 2.27 ha/pers. and a coefficient of variation of 27%.
The forecast for both the national level and the 8 development regions suggests a grim outlook. By 2027, the ratio between the area cultivated with major crops and the agricultural labor force is expected to increase by 76% nationally and by an average of 75% across the development regions.

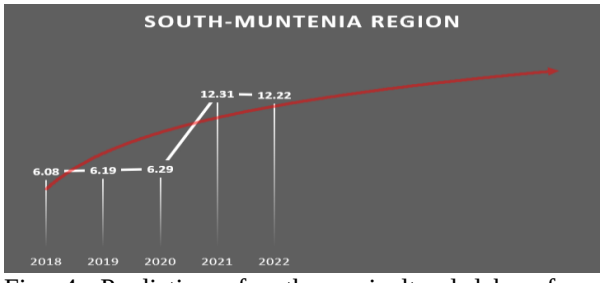


Fig. 4. Predictions for the agricultural labor force relative to the cultivated area of primary crops in the South-Muntenia region (ha/pers)
Source: National Institute of Statistics- Tempo-Online [10], Accessed on April 2, 2024.

At the level of the South-Muntenia development region, the analyzed ratio presents some of the highest values at national level, the resulting average over the analyzed period being equal to 8.62 ha/pers., with a standard deviation of 2.98 ha/pers. and a coefficient of variation equal to 34.6%.
Like the forecast determined at national level, in the case of the South-Muntenia region, it is predicted that in 5 years after the analysis period, an agricultural worker will receive 75% more hectares of the area cultivated with the main crops, reaching 21.5 ha in 2027 compared to 12.2 ha in 2022.

Table 6. Ratio of agricultural labor force to cultivated area of primary crops in the South-Muntenia development region (2018-2022) (ha/person)

	2018	2019	2020	2021	2022	Forecast 2027
SOUTH-MUNTENIA Region	6.08	6.19	6.29	12.31	12.22	21.50
Arges	3.07	3.23	3.23	6.54	6.45	11.55
Calarasi	11.35	11.46	11.21	21.92	21.83	37.56
Dambovita	3.32	3.35	3.26	6.45	6.43	11.09
Giurgiu	7.27	7.60	8.06	15.05	14.55	25.91
Ialomita	10.46	10.53	10.79	20.94	20.38	35.80
Prahova	3.15	3.18	3.25	6.28	6.33	11.06
Teleorman	6.79	6.90	7.15	13.30	13.58	23.53

Source: National Institute of Statistics- Tempo-Online [10], Accessed on April 2, 2024.

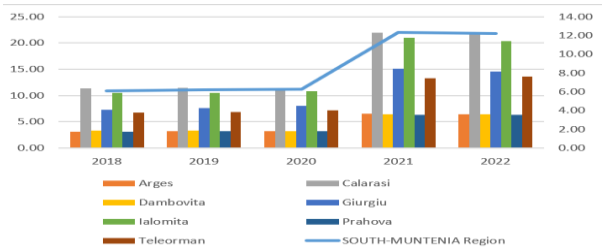


Fig. 5. The correlation between the agricultural workforce and the cultivated area of primary crops in the South-Muntenia development region from 2018 to 2022
Source: National Institute of Statistics- Tempo-Online [10], Accessed on April 2, 2024.

The counties within the South-Muntenia development region exhibit the same negative trend. Due to a significant reduction in the agricultural labor force, the analyzed ratio demonstrates a similar decline by the end of the period compared to the start. This results in an increase in the number of hectares per agricultural worker in each of the seven counties, with this ratio doubling in the final year of the analyzed period compared to the beginning.
On average, for the whole analyzed period, a person employed in agriculture is responsible for 9.10 ha, the highest value of this ratio being found in Calarasi County, where the

average is equal to 15.6 ha/pers., with a standard deviation of 5.16 ha/pers., and the lowest value being found in Prahova County, where the average is equal to 4.4%, with a standard deviation of 1.53 ha/pers. In the case of the 7 counties analyzed, the coefficient of variation is on average 34%, which indicates a large spread of data, precisely because of the very large difference between the data analysis, especially in the last two years analyzed compared to the first three.

CONCLUSIONS

By analysing and processing data from the NSI database using inferential statistics, trends, averages, standard deviations, and coefficients of variation were calculated for the area cultivated with main crops, the agricultural labor force, and the ratio between them. The primary finding is a consistent downward trend in the area cultivated with main crops, the agricultural labor force, and the resulting ratio between the two. This trend is evident at both the national level and across the 8 development regions in Romania, including the 7 counties of the South-Muntenia development region.

Regarding the area cultivated with the main crops, the main conclusion is that although the percentage of this indicator that decreases from year to year is not very high, the continuation of this trend over time may lead to a decrease in the amount of agricultural land with which Romania has been endowed, thus losing an enormous advantage that Romania has over other EU Member States.

Regarding the agricultural labor force, it should be noted that, unlike the area cultivated with the main crops, this indicator has experienced a drastic decrease in the last two years of the analyzed period. The shrinking workforce in agriculture is mostly due to an ageing workforce, a lack of skilled labor, but especially to the decreasing interest of young people to pursue a career in agriculture and especially a career in agriculture in Romania where the income they can earn is not enough to ensure a decent living, which is why they choose to leave the country in search of a better living.

The result of the analysis of the agricultural labor force in terms of the area cultivated with the main crops is also gloomy because the data analysis show that from year to year, a person working in agriculture is given an increasing number of hectares, which over time, if things do not improve, will lead to a negative influence on labor productivity and the yields obtained.

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