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DISPARITIES IN ROMANIA'S AGRICULTURE AMONG THE REGIONS OF DEVELOPMENT

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Abstract

The research aimed to assess the discrepancies exiting among Romania's NUTS-2 microregions of development using a large number of indicators reflecting the status of agriculture in the year 2020, 2022 and 2023, using as information source Eurostat database for which the data were available in March 2025. The research methods utilized in this study refer to: structural index, showing the share of each region in the total level or value of the studied indicator, rank-order method to identify the hierarchy of the regions, comparison method, Herfindahl-Hirschman Index(HHI) to evaluate the competitiveness/concentration among regions for each indicator. The results confirmed that in Romania there are still discrepancies among regions in the development of agriculture. The hierarchy of the regions based on the number of points accumulated for 14 main indicators is the following: Rank 1-63 points, South Muntenia, Rank 2-66 points, North East region, Rank 3-85 points South East region, Rank 4-93 points North West region, Rank 5-117 points South West Oltenia, Rank 6-118 points Central region, Rank 7-139 points West region and Rank 8-165 points Bucharest Ilfov. HHI below 0.15 reflected a competition or lack of concentration among regions for population, labour force, intermediary consumption, factor income, entrepreneurial income; HHI between 0.15-0.25 showed a moderate competition/concentration among regions for area in organic farming, number of farms, crop and animal output, gross value added and gross capital formation. HHI greater than 0.25 reflected a high competition for GDP. Therefore, the disparities among regions still exist and leave "an empty box" for looking for solutions to create a balanced and convergent economic and social development in Romania.

Key words**:** *agriculture, development, NUTS 2 regions, discrepancies, Romania*

INTRODUCTION

The large inequalities among the regions of a country are not beneficial for a harmonious economic, social and environment development.
That is why scientific research is called to offer viable solutions to diminish these disparities and enhance a sustainable development of each region and of the country as a whole.
Regional development is affected by transmission channels which creates an unbalanced economic growth sustaining the rich regions and cities to become more prosperous [13].
In the EU, the territorial disparities are still commonly seen because of the inequalities between rural and urban areas [11, 12].
A balanced economic growth and cohesion among the EU territories imposes the reduction of the gaps between urban and rural areas [34].
For attaining this goal, new strategies and models of sustainable development adapted to the actual situation are necessary for assuring the cohesion [11].
Romania plays an important role in the EU and especially in agriculture and for this

reason the harmonisation of the territorial units is a factor of sustainable development in the future [7, 8].

Among the NUTS-2 microregions of Romania there are still large discrepancies as shown by various specific economic and social indicators, which do not reflect a required convergence [33].

A specific situation has Bucharest Ilfov microregion which is hilly development compared to the rest of 7 microregions [36].

For enhancing a good regional development, Romania must use the structural and cohesion funds for monitoring spatial planning, strengthening administrative capacity, developing modern techniques and tools [2].

Agriculture is must assure food security and be involved in the bioharmonized development of the Romanian regions [9, 10].

A large range of indicators, especially from the economic field must be used to characterize the development of territorial units. GDP is one of these indicators reflecting the development of a country and also of the regions and of the living standard in terms of GDPPPS/inhabitant. It also should be studied in relationship with other economic and social indicators like fixed assets, employment, unemployment, productivity [16, 26].

Romania has not yet a convergent and harmonious economic development as long as the disparities among the microregions still exist [18, 27].

An unbalanced food system with a negative impact on food security is supported by the regional disparities reflected by agriculture contribution to GDP and also by the non corresponding ratio between internal food production, export and import [23].

The territorial disparities are confirmed by the evolution of GDP by region and especially in agriculture in Romania [28].

A more detailed analysis at the county level, that is in the NUTS-3 territorial units could offer a more comprehensive and realistic image of the economic and social development [35].

Also, the gaps of development between rural and urban areas are more suggestive when the convergence is analyzed in Romania [32].

In Romania's agriculture is still working a high share of the population which also reflect the level of development of agricultural production, productivity and rural areas [21, 29, 31].

This fact is also attested the existence of large differences in labour productivity in agriculture among the EU member states and by NUTS-2 regions [21, 22].

Looking for new models to assess territorial inequalities, a synthetic index was created taking into consideration GDP/capita, labor productivity and life expectancy [6].

Another model named PEESH is a multidimensional and compositional index which takes into account: population, economy, education, social, and health). It could be successfully used for assessing the EU territorial development [37].

In this context, this research aimed to present a comprehensive image of the present situation regarding the regional development in Romania and its NUTS-2 microregions, based on a large variety of indicators for which Eurostat Database was able to provide data.

The conception of this paper is an original one and highlights the role of agriculture in the territorial development and also reflect the existing discrepancies among the microregions of the country.

MATERIALS AND METHODS

To set up this research work on the development of agriculture in Romania's eight regions NUTS-2, the data provided by various sites Eurostat have been collected for the list of main indicators selected to characterize the territorial units [3, 4, 5]

For shortening the repeated expressions text, the names of the microregions of development were symbolized as: North West (NW), Center (C), North East (NE), South East (SE), South Muntenia (S Munt), Bucharest Ilfov (B IF), South West Oltenia (SW Olt), and West (W).

For this analysis, *a number of 14 main indicators* has been taken into consideration at the level of Romania and by each NUTS-2 region as follows:

-Territorial area
-Population: total and population density
-Urban-rural typology
-GDP (nominal, PPS) and GDP PPS/inhabitant
-Utilized agricultural area (UAA) and surface converted to organic farming
-Number of agricultural holdings- total and by standard output: less than Euro 8,000/farm and Euro 8,000 and over
-Labour force in agriculture (AWU)
-Number of farm managers - total and by age (less than 35 years old, between35-54 years adn 54 and over)
-Agricultural output- total, crop output and animal output, output of agricultural industry
-Total intermediate consumption
-Gross Value Added (GVA)
-Factor income
-Entrepreneurial income
-Gross fixed capital (Investment).

The data have been collected from Eurostat, various sites, especially for the year 2020, 2022 and 2023 for which the data have been available both for Romania and by each NUTS-2 region and even for NUTS-3 regions where it was the case.

The territorial absolute figures for each region have been transformed into the structural index in order to establish the hierarchy of each microregion for each indicator taken into account.

The rank-order method for each indicator was applied for each region taking into consideration the rule:

-rank 1 is allotted for the highest performance
-rank 8 is allotted for the lowest performance.

The sum of the points received by each region for all the indicators was finally established.

Then, the rank of each region was allotted considering that the region which registered the smallest number of points comes on the top position.

In the decreasing order of the total number of points, it was allotted the rank for all the other 7 regions.

Hefindahl-Hirschman Index, HHI, was calculated for the 14 indicators to assess the competitiveness degree among the 8 microregions of development. For this purpose, it was used the formula:

$$HHI_j = \sum_{i=1}^{n} g_i^2 \quad \text{.....(1)}$$

HHI value was determined by summing the squared share of the regions "*g*" for each indicator in the total level or value of each indicator taken into consideration.

The graphical method was utilized to help the readers to better understand the obtained results looking at the illustrations.

Also, a part of the results were tabled.

The comparison method was utilized to explain the differences among regions for each analyzed indicator.

Suitable comments and interpretations accompanied the results and finally the conclusion highlighted the main results.

RESULTS AND DISCUSSIONS

Territorial area

Romania has a surface of 238,398 km^2, of which 15.5% is in NE, 15% is in SE, 14.4% is in S Munt, 14.3% is in NV and also 14.3% is in the Center, 13.4% is in the W, 12.3% is in SW Olt and 0.8% is in BIF (Fig. 1).

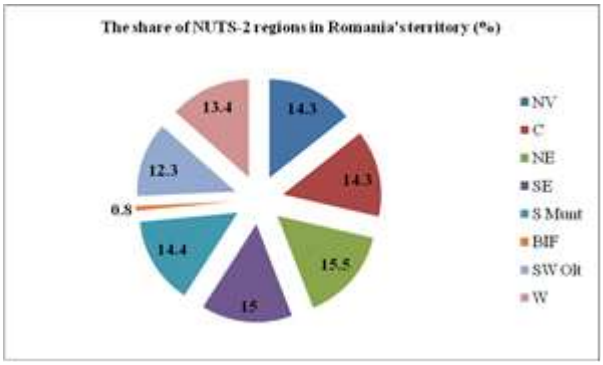

Fig. 1. Distribution of the microregions on Romania's territory based on their area (%).
Source: Own calculation and design based on the data from Eurostat.

Population by region

In 2024, Romania had 19,068,376 inhabitants, whose distribution by microregions was the following: NW 13.3%, Centre 12%, NE 16.9%, SE 12.3%, S Munt 14.9%, BIF 12.1%, SW Olt 9.7%, W 8.8%. This reflects inequalities in the territory regarding human resources (Fig. 2).

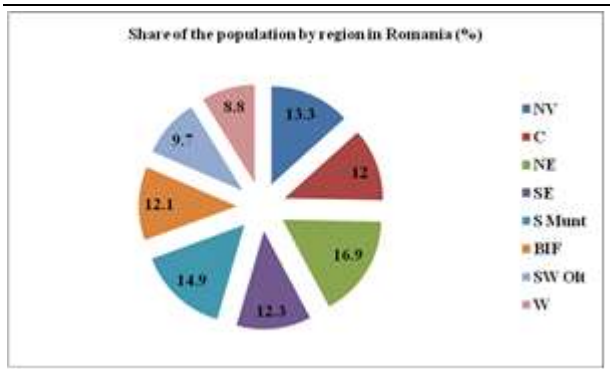

Fig. 2. The distribution of Romania's population by microregion
Source: Own calculation and design based on the data from Eurostat.

A relatively equal percentage of about 12% was found in 3 regions: Centre, South East and Bucharest Ilfov.
The variations from a region to another are determined by demographic, economic, social factors like: births, deaths, economic growth, jobs availability, income sources, migration, living standard etc.
The population density is much more different. Bucharest Ilfov region has 1,278 inhabitants/km^2, becuase of the attraction of the capital of Romania. It is followed by NE with 87.5 inhabitants per km^2, S Munt (82.2), NW (74.3), Center (67.1), SE (65.5), SW Olt (63.5) and W (52.2) (Fig. 3).

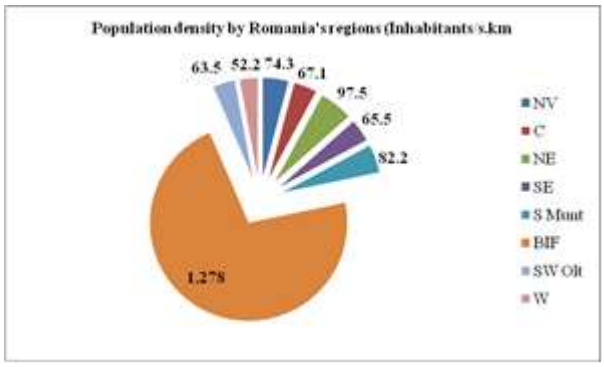

Fig. 3. Population density by region (Inhabitants/km^2)
Source: Own calculation and design based on Eurostat data.

Romania - a rural country

Taking into consideration the "Urban-Rural Typology" which regards the NUTS level 3 regions, that is "counties" in case of Romania, it was established their classification [5].
From this point of view, Romania's regions could be divided into 3 categories:

-*Predominantly Urban Region (PUR),* where in urban clusters live more than 80% of the population. A typical example for Romania is Ilfov County and Bucharest, the capital of the country.
-*Intermediate Region (IR),* where in urban clusters live between 50% and 80% of the population. In this case, there are 12 counties which could be considered as IR: Arad, Timis, Dolj, Constanta, Braila, Prahova, Hunedoara, Cluj, Iasi, Galati, Brasov and Sibiu.
-*Predominantly Rural Regions (PRR),* where more than 50% of the population live in "rural grid cells". In this category, tehre are included the remaining 28 counties: Bihor, Caras Severin, Mehedinti, Gorj, Olt, Teleorman, Giurgiu, Calarasi, Tulcea, Buzau, Dambovita, Arges, Valcea, Alba, Satu Mare, Maramures, Bistrita-Nasaud, Suceava, Botosani, Neamt, Vaslui, Bacau, Vrancea, Covasna, Harghita, Mures, Ialomita si Salaj).
Therefore, we could easily affirm that Romania is a rural country.
However, rural population in Romania is characterized by similar heatures like in many EU countries in terms of aging, lower education level, dealing especially with agriculture in family farms, young people looking for jobs in the cities [14]

Economic development of the regions in terms of GDP

Contribution of the microregions to GDP
In 2023, Romania carried out a nominal GDP accounting for 324,158.45 Euro Million and in terms of PPS it achieved 565,717.34 Euro Million.
The contribution of the regions to the economic development is different from a territorial unit to another.
The contribution of the regions to GDP is the following: 29.5% BIF, 12.1% NW, 11.4% SMunt, 10.7% Center, 10.1% NE, 9.7% SE, 8.8% W, and 7.7% SW Olt. Therefore, from an economic point of view, BIF region comes on the top position, its contribution to GDP being 2.43 times higher than in NW region which comes on the 2nd position. This is justified by the fact that in this part of the country various economic branches are very well developed.

The SW Oltenia is at the oposite pole with only 7.7% contribution (Fig. 4).

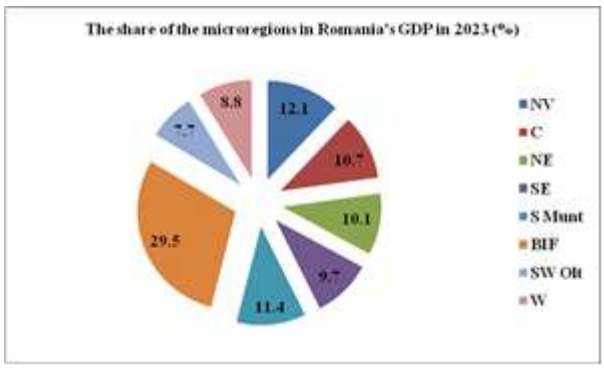

Fig. 4. The contribution of the microregions to Romania's GDP in 2023
Source: Own calculation and design based on the data from Eurostat.

GDP per inhabitant

As an indicator reflecting the living standard, GDP PPS per inhabitant reached Euro 30,388.75 in Romania in the year 2023.

Bucharest Ilfov occupies a special place becuase it includes the capital and for this reason, it is situated in the top of the list with 72,600 Euro/capita, which is 4.1 times higher than only 17,700 Euro/capita achieved in the NE Romania.

On the 2nd position comes the West region, being followed by NW, Center, SW Olt, and SE which carried out each between 27,000 Euro/capita and 23,310 Euro/capita.

Below 23,300 Euro/inhabitant, it was registered in S munt and NE, teh last region recording the lowest GDP of only 17,700 Euro/capita (Fig. 5).

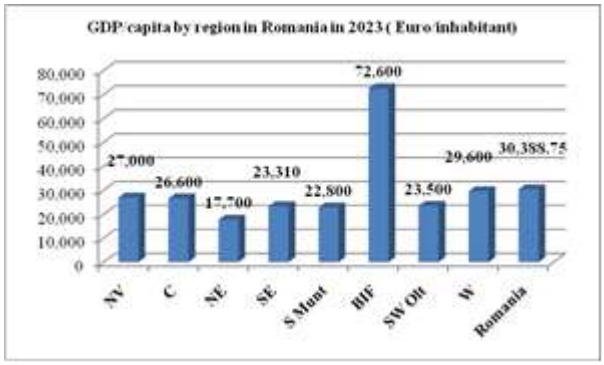

Fig. 5. GDP per inhabitant by microregion of Romania in 2023 (Euro/capita).
Source: Own design based on the data from Eurostat.

Utilized Agricultural Area (UAA)

In Romania, *the utilized agricultural area* represents 12,093,620.81 ha.

Romania's UAA represents 7.68% of the EU-27 UAA, accounting for 157,414,160 ha.

Important variations exist between the microregions from this point of view.

On the top position comes S Munt with a share in total UAA of 17.8%, followed by SE (16.8%), NE (15.5%), NV (13.7%), W Olt (12.1%), Center (11.9%), W (11.6%) and BIF with the smallest weight of only 0.6% (Fig. 6).

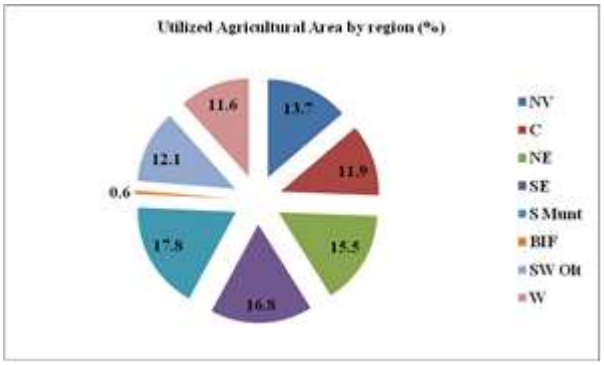

Fig. 6. Distribution of UAA by region in Romania
Source: Own calculation and design based on the data from Eurostat.

Arable land

Also, from the EU-27 arable land of 98,093,810 ha, Romania keeps 8,570, 730 ha, meaning 8.73%.

Agricultural surface converted to organic farming

A high importance in producing a healthier food and more suitable for human metabolism in close connection to environment protection and preservation plays the area which is fully converted to organic farming.

According to the EU and Romania's legislation, in the organic farming the use of genetic modified organisms is forbidden, also the synthetic fertilizers and pesticides as well as the growth stimulators, hormones and antibiotics are interdicted.

Organic agriculture supposes not only production, but also processing, labelling, trade, import, inspection and certification.

At the EU-27 level, the surface used in organic farming system represented 13,076,530 ha, meaning 9.1% of UAA in the year 2020.

In 2024, in the EU, four countries France, Spain, Italy and Germany work all together about 60 % of the surface in organic farming.
In Romania, there are only about 600,000 ha destined for achieving organic production, meaning 5.1% the total UAA .
The share of the regions in organic farming are: SE having the largest cultivated areas (33.6%), W (19%), NW (14.6%), C (13%). In the other regions, the share is below 9% (Fig. 7).

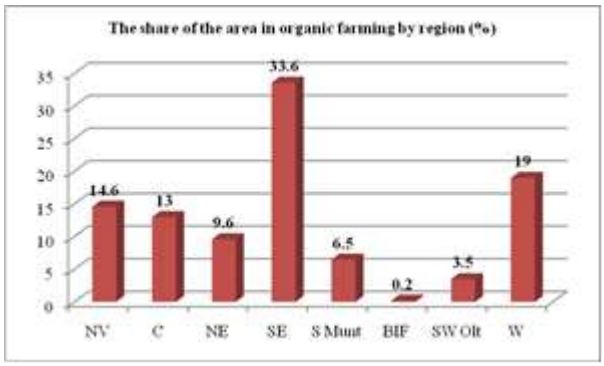

Fig. 7. The share of the surface in organic farming by region (%)
Source: Own calculation and design based on Eurostat.

Number of agricultural holdings

In 2020, the EU-27 had 9,067,300 holdings, while in Romania there were 2,887,078 farms, accounting for 31.8%.
The distribution of farms by microregions is shown in Fig. 8.
In the year 2020, their physical size is small in Romania being in average about 4.3 ha/farm while at the EU level the average size is 17.4 ha/holding. However, only 18% of farms were this size and over. About 64% of these farms are smaller than 5 ha.

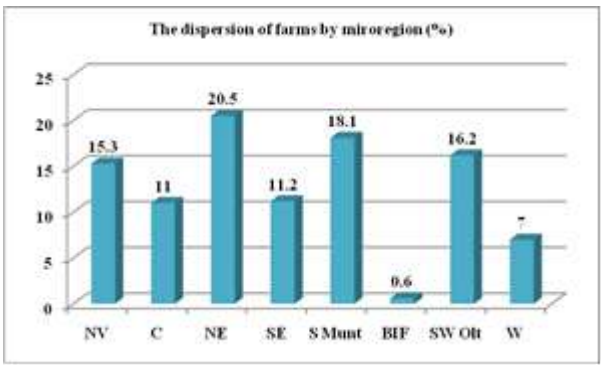

Fig. 8. Distribution of farms by region in Romania
Source: Own calculation and design based on the data from Eurostat.

Regarding the economic size, of the total number of holdings in the EU, 65.6% that is 5,946,618 farms have a standard output smaller than Euro 8,000 and 34.4%, that is 3,120,698 farms have a standard output of Euro 8,000 and over.
In Romania, the economic farm size is the smallest in the EU.
Of the total 2,887,078 farms, 93.7%, meaning 2,794,180 farms are small farms with a standard output below Euro 8,000 and only 6.3% farms, that is 182,880 holdings are able to produce a standard output of over Euro 8,000.
The situation by microregion reflects a large variation of the number of farms and their standard output in the territory of Romania (Table 1).

Table 1. Number of agricultural holdings in Romania by standard output and region of development

	NV	C	NE	SE	SMunt	BIF	SWOlt	W	Romania
Total holdings	493,060	318,480	593,000	324,060	521,960	17,230	466,510	202,770	2,887,078
Less than Euro 8,000	92.2	91.2	95.3	91.8	95.1	96.0	95.7	89.9	93.6
Euro 8,000 and over	7.8	8.8	4.7	8.2	4.9	4.0	4.3	10.1	6.4

Source: Own calculation based on the data from Eurostat.

The West region has 20,530 farms, that is 10.1% farms, which are able to produce more standard output than Euro 8,000. Also, in the Center region 28,100 farms and in the South East 26,650 farms, meaning 8.8%, and, respectively, 8.2% are also powerful holdings from an economic point of view.

In BIF region, 690 holdings, representing 4% carry out over Euro 8,000.

This situation is explained by the high share of the family farms which in the EU-27 accounts for 93.1%, of which less than 50% represent 5.3% and 50% and over is represented by 87.5%.

In Romania, agriculture is dominated by family farms which account for 97.5%, of which below 59% represent 4.1% and over 50% account for 93.5%.

Labour force in agriculture

In the EU-27, labour force accounted for 7,174,690 AWU (Annual Working Unit). In Romania, the level of this indicator is 629,220 AWU, meaning 8.76% of the EU-27 labour force.

Fig. 8 shows the distribution of work force by microregion in Romania.

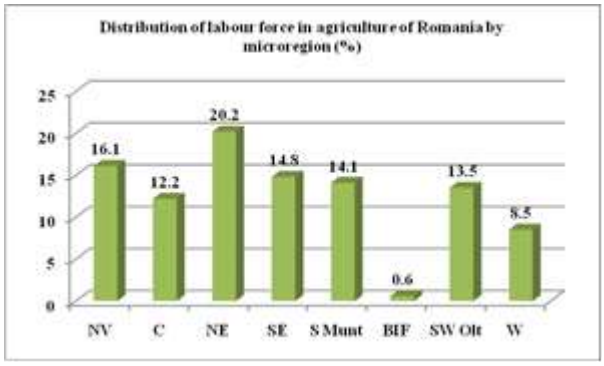

Fig. 8. Dispersion of work force by region
Source: Own calculation and design based on the data from Eurostat.

The regions with the most numerous labour force working in agriculture are NE, NV, SE, S Munt, while BIF has only 0.6% of the total AWU.

Labour productivity in agriculture is enough smaller compared to productivity level in other economic sectors of Romania.

Also, it is smaller than in other EU countries. This is because of the low technical endowment in the small-sized farms which in average have just 4.7 ha/holding [17, 30]

Managers of agricultural holdings

Among other factors, the success in agribusiness depends on the farm manager in terms of training level and experience in the field.

The majority of managers have a practical training, a small percentage has a basic training level and just a few managers have a full training.

Training level, translated into knowledge and skills, is a factor with a deep impact on labour productivity.

Also, the age of the farmers is dominated by the ones over 57 years. Just a few managers are younger than 40 and in general, in Romania, like at the EU level, it is needed to have younger farm managers.

For this reason, the EU adopted special measures to financially support young people to open an agribusiness.

Table 2 presents the situation of the number of holdings managed by farmers classified into three categories in close relationship to their age: younger than 35 years, between 35-54 years old and over 55 years in Romania's microregions in 2020.

Table 2. Number of holdings by region and manager's age in Romania in 2020

Age	NV	C	NE	SE	SMunt	BIF	SW Olt	W	Romania
-	443,060	318,480	593,000	324,060	521,960	17,230	466,518	202, 770	2,887,078
Less than 35 years	15.9	9.5	21.9	12.3	16.2	0.3	16.5	7.4	166,580
35-54 years	15.8	10.4	21.4	11.3	17.8	0.6	15.5	7.1	1,003,600
55 and over	68.3	80.1	56.7	76.4	66	91.1	68.0	85.5	1,716,998

Source: Own calculations based on the data from Eurostat.

The youngest farmers, whose age is below 35 years, manage 166,580 farms, that is 5.76% of holdings in Romania.

Another category of farmers, whose age is ranging between 35 and 54 years, manage 1,003,600 holdings, representing 34.75% of the total farms.

Finally, the farmers older than 54 years manage 1,716,998 farms accounting for 59.47%.

Analyzing the situation by region, it is easily to notice from Table 2 that the farmers younger than 35 years manage 21.9% farms in NE, 16.5% farms in SW Olt, 16.2% in S Munt, and 15.9% farms in NW. Only 0.3% farms in BIF are managed by young farmers.

The farmers whose age is between 35-54 years manage 21.4% farms in NE, 17.8% farms in S Munt, 15.8% in NW and 15.5 % in SW Olt.

The oldest farmers manage 91.1% farms in BIF, 85.5% farms in West region, 80.1% in Center region, 76.4% farms in SE.

In the EU-27, in 2020, 9,867,300 farms had young managers, of which 588,780 farms (6%) have managers younger than 35 years and 3,258,330 farms (33%) have managers between 35-54 years old.

Agricultural output

Total agricultural output

In the year 2022, Romania's agricultural output accounted for 20,368.45 Euro Million, of which 14,583.47 Euro Million crop output and 5,219.41 Euro Million animal output, representing 71.5% and, respectively, 25.6%. The difference of 2.9% is represented by agricultural services.

The output of agricultural industry accounted for 22,218.82 Euro Million.

The highest agricultural output was carried out in S Munt (23%), SE (15.8%), NE (15%), NV (11.3%) and the lowest level in BIF (1.9%) (Fig. 9).

The crop output registered the top level of 26% in S Munt, followed by SE (16.5%), SW Olt (13.8%), NE (13.4%) and the lowest level of 1.1% in BIF region (Fig. 10).

Most of the farmers develop business in cereals and oil seed plants cropping. Maize, wheat and barley are the main cereals cultivated in Romania, the country being recognized as a top cereal producer and exporter in the EU. Also, the country is also considered an important producer of sunflower and rape seeds for oil and producing renewable energy [20, 24].

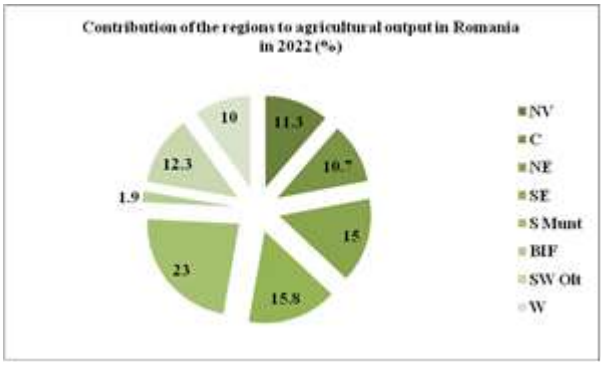

Fig. 9. Share of agricultural output by region (%)
Source: Own calculation and design based on the data from Eurostat.

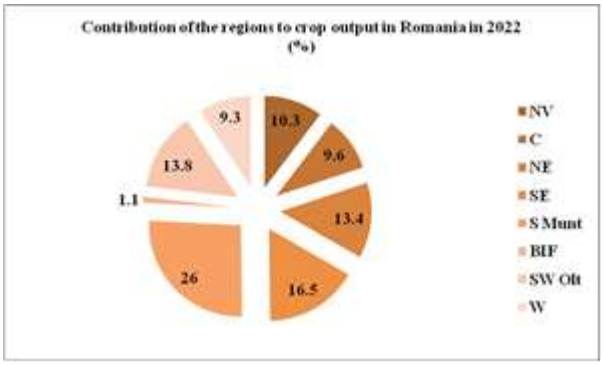

Fig. 10. Share of crop output by region (%)
Source: Own calculation and design based on the data from Eurostat.

Most of the farmers develop business in cereals and oil seed plants cropping. Maize, wheat and barley are the main cereals cultivated in Romania, the country being recognized as a top cereal producer and exporter in the EU. Also, the country is also considered an important producer of sunflower and rape seeds for oil and producing renewable energy [20, 24].

The animal output represents 25.6% of the agricultural output because many farmers have been much more oriented to crop production which is easier and more convenient to be practiced and brings income in shorter period of time. Other reasons of the decline in livestock and animal production are: the lower forage production determined by the severe droughts, various diseases affecting pigs, poultry and sheep, the low acquisition price for milk and live animals [15, 25, 19]

The top animal output was registered in NE (19.9%), S Munt (15.7%), NV (15.1%), Center (14.3%) and the lowest level of only 0.3% in BIF region (Fig. 11).

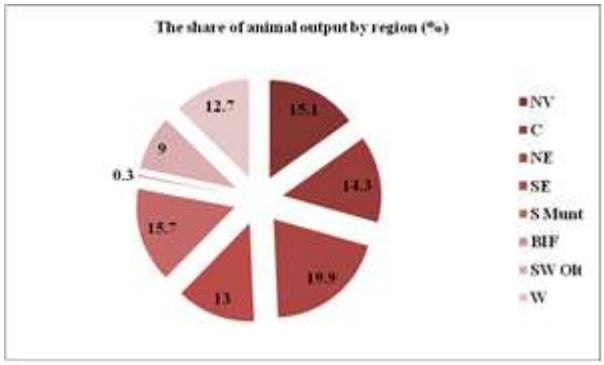

Fig.11. Share of animal output by region (%)
Source: Own calculation and design based on the data from Eurostat.

The highest weight of output in agricultural industry was noticed in S Munt (22.15%), followed by SE (15.5%0 and NE (15.4%) and the smallest level of 1.8% in BIF region (Fig. 12).

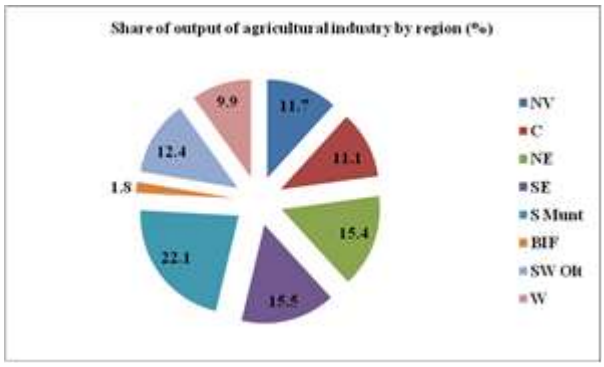

Fig.12. Share of output of agricultural industry by region (%)
Source: Own calculation and design based on the data from Eurostat.

Total intermediate consumption in agriculture

For running the production process, agriculture requires a large variety of inputs such as: seeds, planting material, fertilizers, herbicides, pesticides, animals, forages, medicines, fuel, energy, agricultural services etc. All these translated in money represent the total intermediate consumption in this field.

Romania registered 12,289.28 Euro Million intermediate consumption in agriculture in the year 2022.

By region, the situation is as follows: S Munt 21.72%, followed by NE 15.9%, SE 15.8% and NV 12.1%. The lowest intermediate consumption was registered in BIF, only 0.8% (Fig. 13).

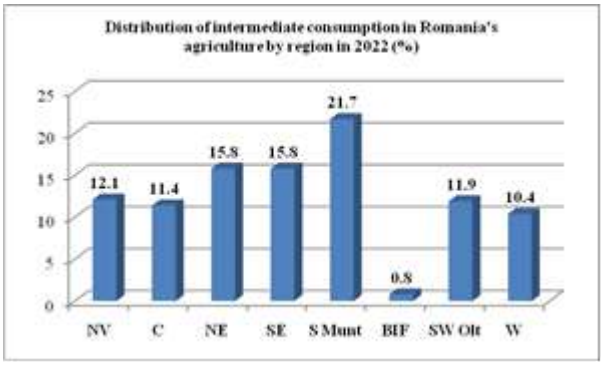

Fig. 13. Dispersion of intermediate consumption in agriculture in 2022 (%)
Source: Own calculation and design based on the data from Eurostat.

Gross Value Added -GVA produced in agriculture

In 2022, Romania carried out 9,929.62 Euro Million at basic price GVA in agriculture.

S Munt is the region producing the highest level of GVA, accounting for 21.7% of the total in the country. Other regions produced: SE 15.9%, NE also 15.9% and NW 12.8%.

The smallest GVA is achieved in BIF, only.0.8 % (Fig. 14).

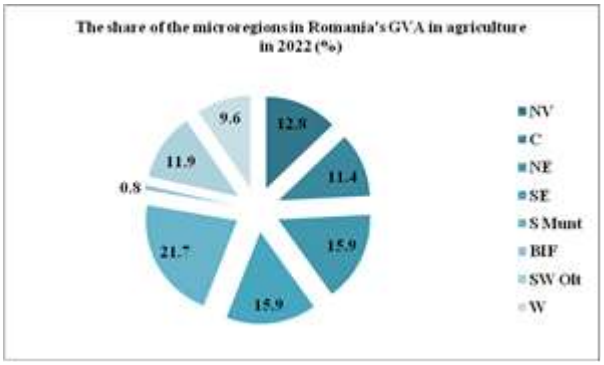

Fig. 14. The contribution of the regions to GVA in Romani's agriculture in 2022 (%)
Source: Own calculation and design based on the data from Eurostat.

Compared to 2015=100, in 2023, the real growth rate of GVA at basic price was the following by region: 188.5% BIF, 150.5% NW, 145.9% W, 125% Center, 105.2@ SE, 102.2% NE. But, other two regions achieved only 96.9% SW Olt and 91.2% SMunt.

Factor income

Production factors could generate income flows. In agriculture, factor income comes from the use of land (rent), capital (profit) and labour force (wages). Therefore, it

measures the remuneration of all the production factors mentioned above.
It corresponds to "the net value added at factor cost. Agricultural factor income is a sum of the value of variable input costs, depreciation, taxes on products and production, and subsidies [1] In 2022, Romania carried out 7,534.90 Euro Million factor income from agriculture. The top level was achieved by S Munt accounting for 22.5% of the total. Then, SE has a share of 16.6%, NE 14.7%. The lowest factor income was got in BIF, only 2.7% (Fig. 15).

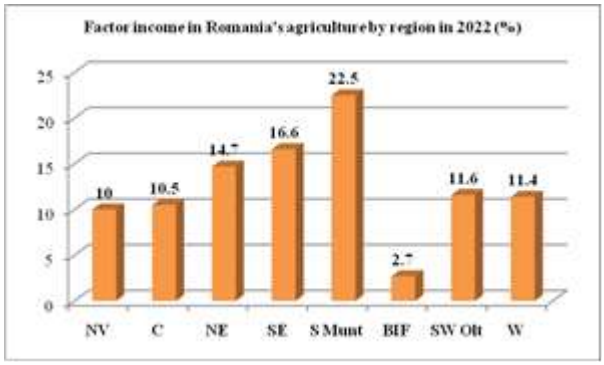

Fig. 15. Factor income by region in Romania's agriculture
Source: Own calculation and design based on the data from Eurostat.

Entrepreneurial income in agriculture

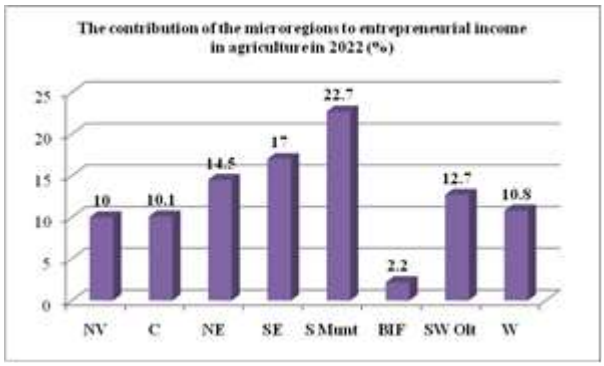

Fig. 16. The contribution of the microregions to Romania's entrepreneurial income in agriculture
Source: Own calculation and design based on the data from Eurostat.

The income resulting from economic activities in agriculture is named "entrepreneurial income" and could be used for the remuneration of own production factors (family labour, farm land, own capital). In the year 2022, Romania obtained 5,821,67 Euro Million entrepreneurial income in agriculture and the contribution of the microregion to this figure was the following: SMunt 22.7%, the top share, SE 17%, NE 14,5%, SW Olt 12.7. The smallest contribution was given by BIK, only 2.2% (Fig. 16).

Gross fixed capital formation - Investment in agriculture

The development of a modern agriculture requires investment in various fixed assets: new machinery, installations, sheds etc.
In Romania, in 2022, the value of investment (excluding VAT) in agriculture accounted for 2,058.88 Euro Million. By region, the situation was as follows: SE kept the highest share in gross capital formation 23.2%, followed by S Munt 17.7%, Center 16.4% and NE 14.6%. The lowest weight in total investment belonged to BIF, only 0.5% (Fig. 17).

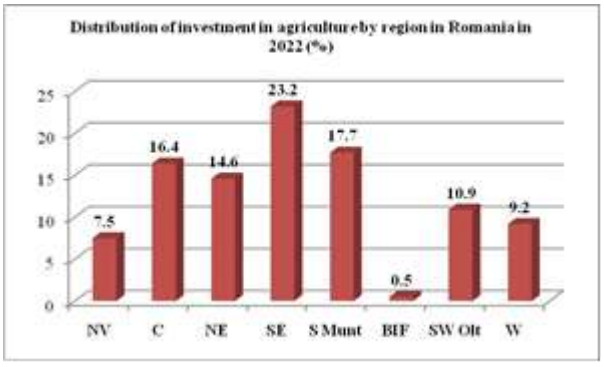

Fig. 17. The distribution of investment by microregion in Romania's agriculture in 2022 (%)
Source: Own calculation and design based on the data from Eurostat.

The regions hierarchy based on the final points

Taking into account the points received by each microregion for each criterion, it was established the rank of each region of Romania as shown in Table 3.
Therefore, as shown in Table 3, the hierarchy of the microregions based on their performance achieved for the indicators used as criteria for comparison is the following one in the decreasing order: South Muntenia, North East, South East, North West, South West Oltenia, Center, West and Bucharest Ilfov.

Table 3. Total number of points and the rank of each microregion in Romania based on the whole assessment based on the level of all indicators used as reference term

	NV	C	NE	SE	S Munt	BIF	SW Olt	W
Total points	93	118	66	85	63	165	117	139
Rank	4	6	2	3	1	8	5	7

Source: Own calculations.

The competitiveness among the development regions NUTS-2 in Romania

The results for Herfindahl-Hirschman Index determined for 14 indicators are shown in Table 4.

Table 4. The competitiveness among regions of development in Romania

Indicator	HHI	Interpretation
Population-total	0.1299	Competitiveness, lack of concentration
GDP-total	0.2985	High concentration degree
Utilized agricultural area (UAA)	0.1446	Competitiveness, lack of concentration
Area in Organic farming	0.2017	Moderate competitiveness or concentration degree
Number of farms	0.1534	Moderate competitiveness or concentration degree
Labour force	0.1439	Competitiveness, lack of concentration
Agricultural output	0.1500	Moderate concentration or competitiveness
Crop output	0.1603	Moderate competitiveness or concentration degree
Animal output	0.1614	Moderate competitiveness or concentration degree
Intermediary consumption	0.1497	Competitiveness, lack of concentration
Gross Value Added (GVA)	0.1505	Moderate competitiveness or concentration degree
Factor income	0.1409	Competitiveness, lack of concentration
Entrepreneurial income	0.1415	Competitiveness, lack of concentration
Gross capital formation (Investment)	0.1593	Moderate competitiveness or concentration degree

Source: Own calculations.

To remind how the valued of HHI must be interpreted:

-HHI equal to zero or 0.01 tells us that among regions it is a very high competitiveness

-HHI smaller than 0.15 reflects competitiveness among regions or, in other words, it shows that it is a lack of concentration regarding the indicator in discussion;

- HHI between 0.15 and 0.25 reflects a moderate concentration;

-HHI over 0.25 shows a lack of competitiveness, in other words a high concentration;

-HHI equal to 1 means a monopoly that is only one region dominate all the other regions for the indicator in discussion.

CONCLUSIONS

This research identified again the discrepancies exiting among the microregions of Romania, a fact which produce delays in the balances and sustainable development of the whole country and of its territorial units.

On the top position with the smallest number of points accounting for 63 is South Muntenia which has the largest UAA, the highest agricultural output, the highest intermediary consumption and GVA, the top factor income and entrepreneurial income. For the number of holdings and managers it comes on the 2nd position and also for animal output.

On the 2nd position with 66 points is NE region, which has the largest territorial area and it ranked the 1st for the number of holdings and managers, and for the managers' age structure and for animal output, but for crop output it comes on the 4th place.

On the 3rd position with 85 points it is situated the SE region. For the utilized agricultural area it is situated on the 2nd position, but for the surface for organic farming it is comes on the 1st place. It comes on the 5th position for the number of holdings, managers and also for their age structure. But for agricultural output and crop output, this region is ranked the 2nd, as well as for intermediary consumption, GVA, factor income and entrepreneurial income. Also, it is

on the 1st position for gross fixed capital (investments in agriculture).

The NW region is situated on the 4th position for its 93 points. It is ranked the 4th for utilized agricultural area, number of holdings, standard output/farm, managers whose age is over 54 years, also it comes on the 5th position for agricultural output and crop output, on the 3rd position for animal output and GVA and on the 7th place for factor income, entrepreneurial income and investment.

SW Oltenia region registered 117 points for which it is ranked the 5th. For utilized agricultural area it is also placed on the 5th position, but for the area in organic farming it comes on the 7th position, also for the number of holdings and managers, but it is on the 2nd position for young managers less than 35 years. For agricultural output, the region is situated on the 4th position, but for crop output is on the 3rd position, while for animal output it is ranked the 7th. In case of internal consumption, GVA, income it comes the 4th.

On the 6th position is situate the Central region, which accumulated 118 points. Its UAA is much smaller, but organic farming offer the region the 4th position among the other regions. The region has a smaller number of holdings, but their economic size places the region on the 2nd position, both for farms with less than Euro 8,000 and over Euro 8,000/farm and year. The managers are older than in the previous regions, agricultural output is smaller and place the region on the 6th position, as well as for crop output. But, the region comes on the 4th position for animal output, on the 5th position for intermediary consumption and GVA, and on the 6th place for factor income.

The West region registered 139 points which passed it on the 7th place among the other regions. For the majority of indicators, this region was ranked the 7, and just for income it came on the 6th position.

Finally, Bucharest Ilfov region is ranked the 8th for 165 points. It is on the top position for population and its density and for GDP/inhabitant. But regarding the performance in agriculture it came on the 8th position for 90% of the indicators used in its assessment. This prove that agriculture has a low importance in this region which has the privilege to include the capital of Romania where people have more chances for applying for better paid jobs and a higher living standard.

This study confirmed the existence of disparities among the NUTS-2 microregions of Romania and leave "an empty box" for finding solutions to eliminate this gaps of economic and social development in Romania.

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