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STUDY ON THE EVOLUTION OF THE NUMBER OF AGRICULTURAL FARMS, THEIR AVERAGE SIZE AND AGRICULTURAL PRODUCTION IN DAMBOVITA COUNTY, ROMANIA

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Abstract

The purpose of this study is to objectively analyze the situation of agricultural holdings in Dambovita county, both in terms of their size and dimension, but also their evolution, with the aim of highlighting the existing gaps compared to the European Union average, problems and dysfunctions what characterizes the agricultural sector, but also its prospects for development and performance growth. The research methodology first of all assumed the analysis of specialized literature regarding the importance of agriculture for the economy and its role in increasing income for farmers, and on the other hand, the collection and processing of national and county statistical data regarding agricultural holdings. Based on the analyzed data, conclusions and recommendations were formulated regarding the reduction of existing gaps between Romanian agriculture, Dambovita County and community agriculture. It was thus established that compared to the average size of the agricultural holding registered at the national level, of 2.37 ha, at the level of Dambovita county, it is 4.37 ha. This is due to the specific relief and activity. However, the average size of agricultural holdings is well below the average size of existing holdings at European Union level, where it is 152.4 ha in the Czech Republic, 90.4 ha in the United Kingdom or 77.5 ha in Slovakia.

Key words: *agricultural holding, average size, production, area, Dambovita County, Romania*

INTRODUCTION

The growth of the world's population, industrialization, urbanization are factors that put a direct pressure on agriculture and on the provision of food resources, which requires an increase in production, under the conditions in which environmental protection is also required.

Under these conditions, establishing the optimal size of agricultural holdings represents an important measure in ensuring productivity, conditioned by sustainable development, which is a concept that governs all fields of activity in the modern world and which must be supported by political and economic instruments. In the agriculture of the European Union, the formulation of these policies is influenced by the size of agricultural holdings, which differ not only between member states, but also at the level of individual countries [10, 15].

Over time, the size of agricultural holdings was influenced by the transition from extensive agriculture to intensive agriculture, which made the average size inversely proportional to the labor force in agriculture, which in turn was influenced by the modern technologies used, by the mechanization of agriculture, the use of imputations with increased yields, etc. [6, 7].

Starting with the 60s, different currents of opinion were outlined regarding the relationship established between the productivity of an agricultural holding and its size. There were specialists who considered that the dependent relationship is directly proportional [1, 3, 5, 13], while others considered that this cannot be demonstrated [2, 8, 12, 20], under the conditions that productivity is influenced by many other factors. And in Romania, specialized works

tried to confirm or deny the relationship between the size of the agricultural holding and its profitability [4, 11, 14]. However, whatever the opinions related to the size of agricultural holdings, this is an important topic in the development of agricultural policies, in measuring efficiency, in supporting financing policies.

Equally important are the creation of partnerships between producers, a better integration of agriculture, sustainable rural development, ensuring the constant demand for agricultural and food products by consumers, reducing the trade deficit,

increasing the standard of living, ensuring food security, etc. that is, aspects that must be analyzed in accordance with the size of the agricultural holding [16, 22].

At the moment, in Romania, agriculture At the level of Romania, one of the important sectors of the economy is agriculture. In 2021, this had a 4% contribution to the Gross Domestic Product [21]. As a member state of the European Union, Romania has a high potential in this sector of activity, being in sixth place in terms of used agricultural area among EU countries, which amounts to 13.9 million hectares. Of this area, almost 60%, i.e. 8.2 million ha, is arable land, of which approximately 5.5 million ha are intended for the cultivation of cereals, which makes Romania one of the top 10 exporters of cereals worldwide. In 2021, it held the 9th place in the export of wheat, the 8th place in the export of sunflowers and the 6th place in the export of corn.

Compared to the other member states of the European Union, Romania is the country that registers low yields of agricultural production [19, 20]. At the level of 2021, the productivity recorded by the agricultural holdings was only 25% compared to the average productivity recorded in the agricultural holdings of the member states.

Another aspect that must be analyzed is the one related to the fragmentation of properties. Romania is in the last place among the states of the union from this point of view, an aspect that influences the size of agricultural holdings. Other countries facing the same situation are Malta and Cyprus. In terms of number, agricultural holdings in Romania have a weight of 35% of the number of community agricultural holdings. Of their total, over 98% have areas smaller than 10 ha, but the area owned by them represents only 39% of Romania's agricultural area. The number of agricultural holdings with areas larger than 100 ha represents 0.5% of the total number, holding 49% of the agricultural area.

The average size of an agricultural holding in Romania is 3.65 ha in 2020, larger by 0.15 ha compared to 2010, but still far behind the European Union average where the average surface is 16.6 ha.

As far as the capitalization of agriculture is concerned, it is quite low, affecting the yield of productions obtained and placing Romania in the penultimate place among the countries in the European Union [9]. According to data from 2021, approximately 2% of the number of agricultural holdings own at least one tractor. Other problems of Romanian agriculture are related to the lack of irrigation systems, the farmers' reduced spending on plant protection products, poor integration of production, the extensive areas affected by soil degradation, the lack of efficient collection and storage systems, poor processing capacity, aging workforce, low level of professional training, low level of association, credit systems not adapted to farmers' needs, etc.

MATERIALS AND METHODS

The methodology that was the basis of the research carried out involved the use of analysis methods and techniques based on the principle of triangulation. Thus, the collected data were processed and interpreted, being able to formulate conclusions and recommendations regarding the development direction of agriculture in Dambovita county. The three types of methodological tools were data collection methods, quantitative analysis methods and qualitative analysis methods.

Starting from the bibliographic study regarding the role that agriculture has in the economic development of Romania, as well as from its place within the economy, the ways of determining the optimal size and size of

agricultural holdings were sought, with the aim of increasing profitability.

The qualitative and quantitative analysis was based on the statistical information collected both at the county and national level. The statistical information was collected at a level of aggregation that made possible the relevance of the analysis carried out in the report. The statistical data were taken from the Statistical Yearbook of Dambovita County, for the period 2016-2020 and were processed using the following methods:

- The dynamics index with a fixed base, to determine the increase or decrease from 2020 compared to 2016:

$$IFB = (x_n/x_1) \times 100 \quad (1)$$

- The graphical illustration of the dynamics highlighted the regression model and the coefficient of determination

RESULTS AND DISCUSSIONS

The statistical data published in March 2022 show that in 2020 there were 2,887 thousand agricultural holdings in Romania, a decrease of approximately 970 thousand holdings compared to 2010. This decrease led to an increase in the average agricultural area of 28% in 2020 compared to 2010, that isan increase of 0.97 ha. At the same time, the agricultural area used was 12.8 million hectares in 2020, 543 thousand hectares less than in 2010, which is a decrease of 4.1%.

Regarding the decrease in the number of agricultural holdings, it should be added that the biggest decreases were recorded for very small holdings. In the case of holdings with an area of less than 0.1 ha, the decrease was 6% in 2020 compared to 2010. For agricultural holdings with an area of more than 10 ha, however, increases were recorded, being 2% in 2020 compared to the year 2010.

According to the data from the 2020 General Agricultural Census, it can be seen that in the last ten years there have been changes regarding the agricultural area used and the number of agricultural farms. Percentage-wise, it was found that 54% of the agricultural holdings had an area of less than 1 ha, 36% of them had an area between 1-5 ha and only 1% of them had an area of more than 50 ha. On the other hand, very small agricultural holdings (under 1 ha) exploited 5% of the total agricultural area, and those between 1-5 ha, exploited 18% of the total area. However, agricultural holdings with an area of more than 50 ha exploited 54% of the total agricultural area.

It was also noted that the average agricultural area for entities with legal personality was 2.73 ha in 2020, and for agricultural holdings without legal personality, it was 194.78 ha, compared to 1.95 ha, respectively 190.78 ha in 2010.

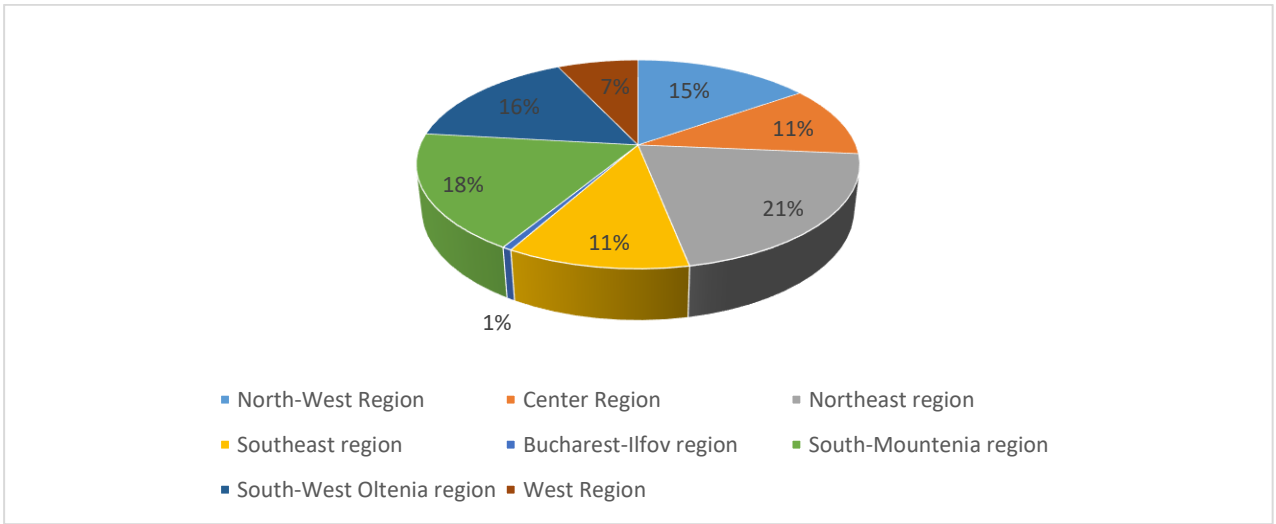

Fig. 1. Structure of agricultural holdings, by region, in 2020 (%)
Source: own processing [17].

From the total of 2,887 thousand agricultural holdings, the largest share (21%) is in the North-East Region, followed by the South-Muntenia Region (18%) and the South-West Region - Oltenia (16%). The lowest share of agricultural holdings is in the Bucharest-Ilfov Region, with approximately 1% (Fig. 1). From the point of view of the agricultural areas used, based on the data provided by the General Agricultural Census 2020, it is found that there are variations in the average areas at the regional level. The largest average area is recorded in the West Region (7.46 ha), followed by the South-East Region (6.71 ha) and the Center Region (5.05 ha). The smallest average area is recorded in the North-East Region, with an average area of 3.09 ha. The Bucharest-Ilfov region registers an average area of 4.65 ha (Fig. 2).

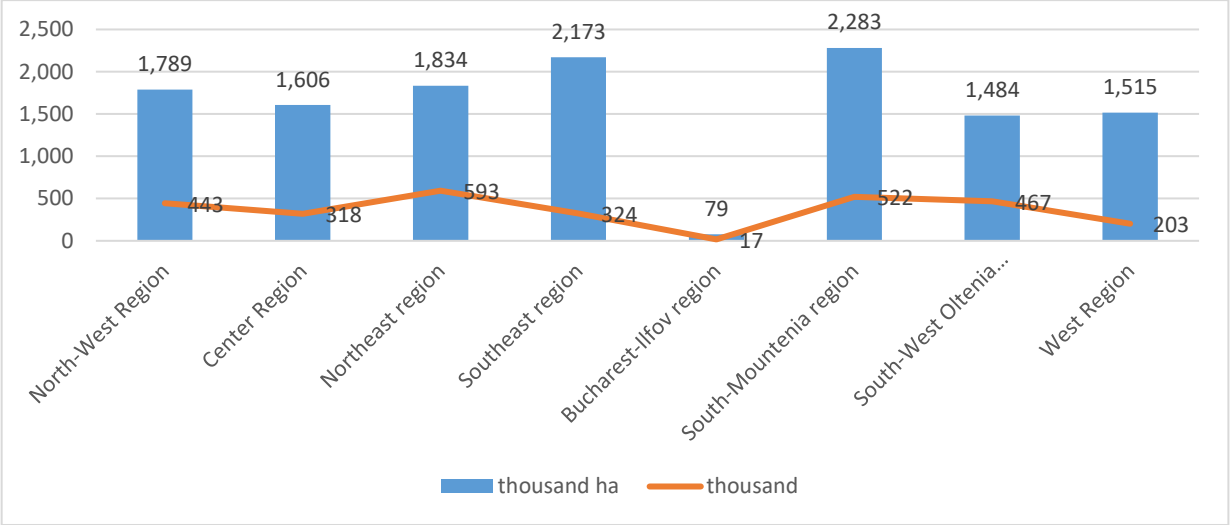

Fig. 2. The situation of agricultural holdings and surfaces, by region, in 2020
Source: own processing [17].

Dambovita County is part of the South-Muntenia Region, a region where the average area of the agricultural holding is 4.37 ha.

The area of the land fund of the county, in 2020, was 404,542 hectares. Of its total, 60% is the agricultural area, whose distribution is as follows: 172,820 ha of arable land, 39,190 ha of pastures, 20,679 ha of pastures, 11,173 ha of fruit orchards and nurseries and 320 ha of vineyards and wine nurseries.

The cultivated area in 2020 was 170,609 ha, increasing by 8.5% compared to 2016 and 3.4% compared to the previous year (Fig. 3).

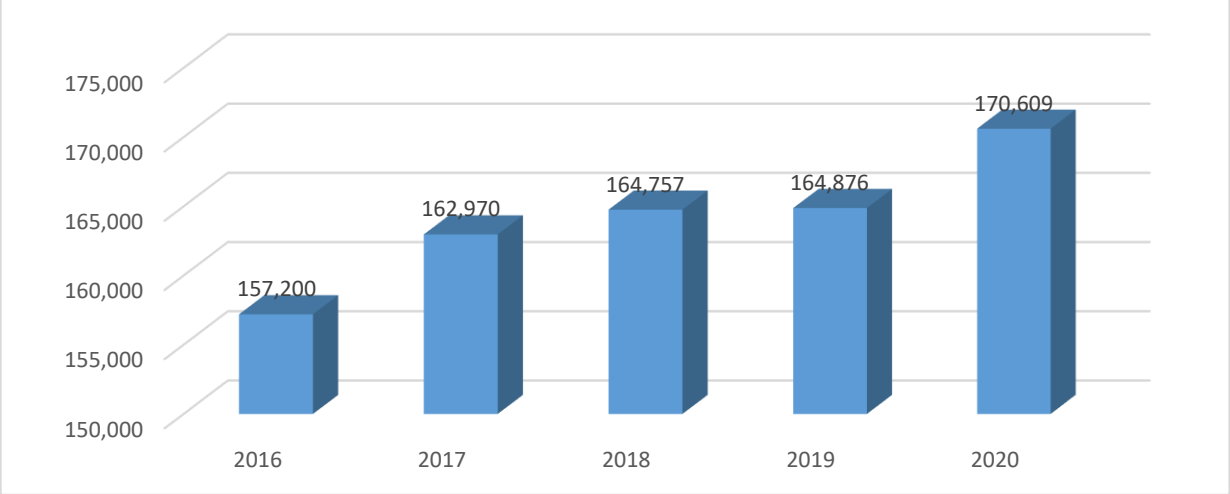

Fig. 3. Evolution of the cultivated area in the period 2016-2020, in Dambovita County (ha)
Source: own processing [17].

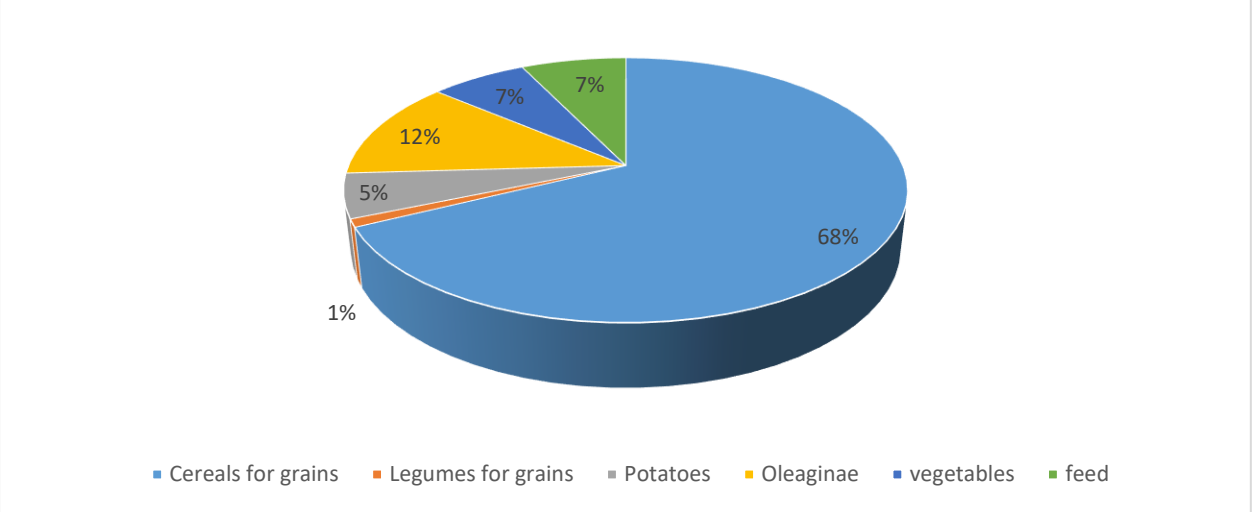

Fig. 4. The structure of the cultivated area in Dambovita County, in 2020
Source: own processing [17].

Of the total cultivated area (Figure 4), 68% is intended for the cultivation of cereals, 12% for the cultivation of oleaginous plants, 7% each for the cultivation of fodder and vegetables and 5% for the cultivation of potatoes.

Regarding the average productions per hectare, it is noted that they decreased in 2020 compared to 2018 for cereal for grains, legumes for grains, oilseeds and vegetables. The only increase was recorded in potatoes. Regarding cereals, the decrease in 2020 was 22 percentage points compared to 2018 and 6% compared to 2019. The average production of legumes for grains, although it increased by 13 percentage points in 2019 compared to 2018, decreased by 25 percentage points in 2020. In potatoes, the average production decreased by 6 percentage points in 2019 compared to 2018, but increased by 6 percentage points in 2020 compared to 2018. In oleaginous plants, the average production increased by 12 percentage points in 2019 compared to 2018, and a decrease of 11 percentage points in 2020 compared to 2018. Regarding vegetable production, it decreased by 6 percentage points in 2019 and by 20 percentage points in 2020 compared to 2018. Dambovita County is one of those that have a large area occupied by fruit plantations (Fig. 5).

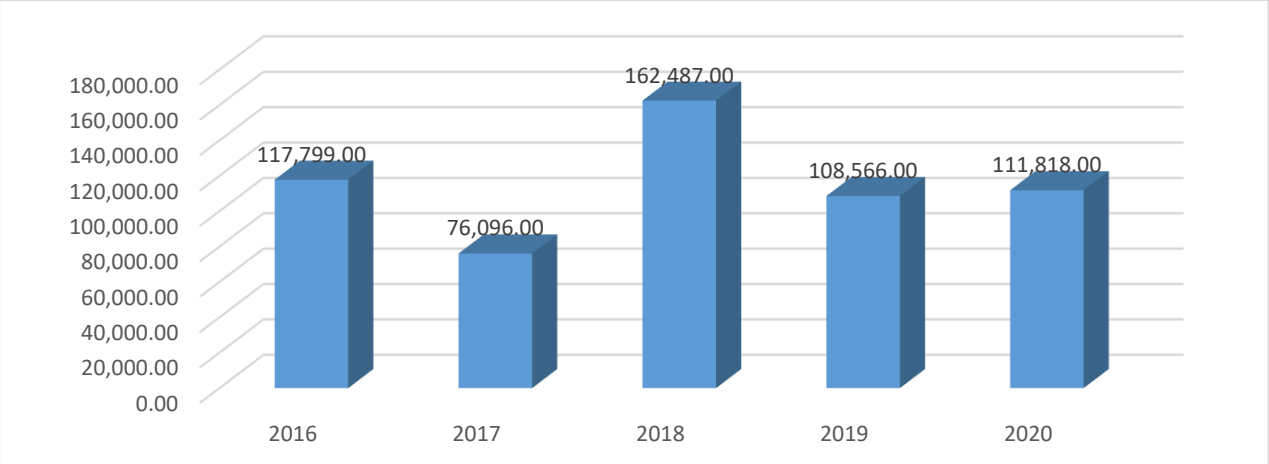

Fig. 5. Evolution of total fruit production in Dambovita county, in 2020 (tons)
Source: own processing [18].

Regarding the structure of fruit production, in 2020, in Dambovita County, the largest shares were held by apple production (52%) and plum production (40%). The difference of 8%

was shared by the production of pears (4%), cherries and cherries (2%), apricots and cherries (1%) and peaches (under 1%) (Fig. 6).

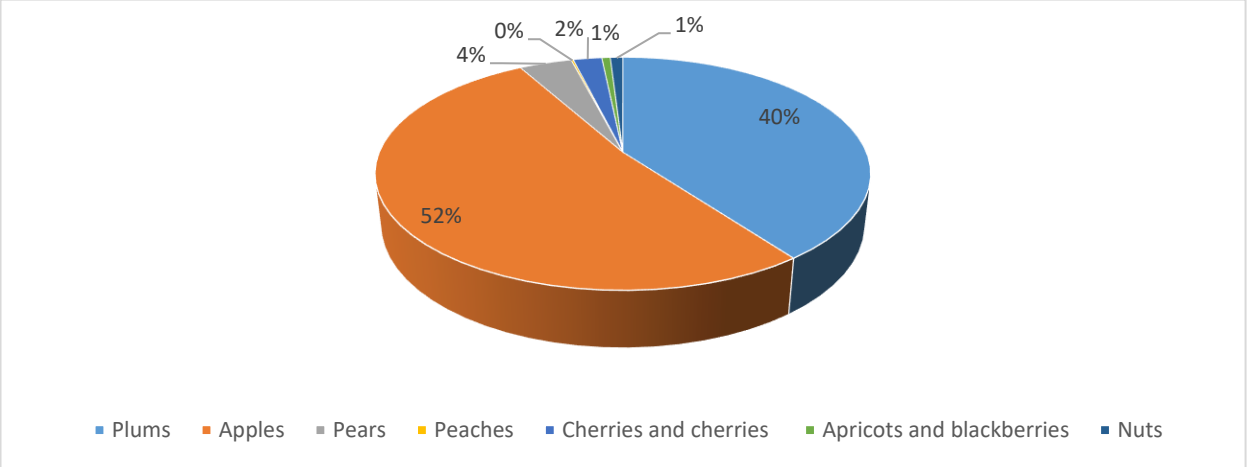

Fig. 6. Structure of total fruit production in Dambovita county, in 2020 (%)
Source: own processing [18].

CONCLUSIONS

Romania's agriculture, and therefore that of Dambovita County, represents a sector of the economy that has potential for growth. At the analyzed county level, agriculture is an economic activity that contributes approximately 8% to the gross added value of the county.

Vegetable production is mainly oriented towards the cultivation of grains, potatoes, vegetables and fruits. The production of vegetables, fruits and potatoes places Dâmboviţa county in the category of the largest producers at the country level. We note that as regards the average size of an agricultural holding, it was 4.37 ha at the level of 2020, being far below the average size of community agricultural holdings. In the Czech Republic the average surface is 152.4 ha, in England it is 90.4 ha, in Slovakia the average surface is 77.5 ha, in Denmark the average surface is 62.9 ha, and in Germany the average surface is of 55.8 ha.

However, the average area is 60% higher than the average of agricultural holdings registered at the national level (2.73 ha).

The need to increase the average areas is determined by obtaining production increases that contribute to increasing the profitability of farms, which are related not only to the increase of the area, but also to the realization of investments, the use of high-performance production systems or the development of agricultural entrepreneurship.

REFERENCES

[1]Benjamin, D., Brand, L., 2002, Property Rights, Labor Markets, and Efficiency in a Transition Economy: The Case of Rural China. The Canadian Journal of Economics, Vol. 35(4). 689- 716.

[2]Bhalla, S. S., Roy, P., 1988, Mis-Specification in Farm Productivity Analysis: The Role of Land Quality. Oxford Economic Papers, New Series, Vol. 40(1), 55-73.

[3]Carter, M., 1984, Identification of the inverse relationship between farm Size and productivity: an empirical analysis of peasant agricultural production. Oxford Economic paper, New series, Vol. 36(1), 131-145.

[4]Draghici, et al, 2004, Farm Management Manual, ATLAS PRESS SRL Publishing House, Bucharest, pp.26-55.

[5]Firbank, L.G., Elliott, J., Drake, B., Cao, Y., Gooday, R., 2013, Evidence of sustainable intensification among British farms. Agriculture, Ecosystems & Environment, pp. 58–65.

[6]Griffin, K., Khan, A. R., Ickowitz A., 2002, Poverty and Distribution of land. Journal of Agrarian Change, Vol 2 (3), 279 - 330.

[7]Hartvigsen, M.B., 2014, Land reform and land fragmentation in Central and Eastern Europe. Land Use Policy, 36, pp. 330–341.

[8]Helfand, S., 2003, Farm size and the determinants of productive efficiency in the Brazilian CenterWest, 25th International Conference of Agriculture Economists (IAAE).

[9]Ionita, N., Marcuta, L., Marcuta, A., 2018, The evolution of agricultural holdings in macroregion four

(South West-Oltenia) after Romania's integration into the European Union, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 18(2), 255-258, http://managementjournal.usamv.ro/pdf/vol.18_2/Art33.pdf, Accessed on 12.09.2022.

[10]Janovska, V., Simova, P., Vlasak, J., Sklenicka, P., 2017, Factors affecting farm size on the European level and the national level of the Czech Republic, Agric. Econ. – Czech, 63, 2017 (1): 1–12, doi: 10.17221/317/2015-AGRICECON, https://www.agriculturejournals.cz/publicFiles/317_2015-AGRICECON.pdf, Accessed on 12.09.2022

[11]Luca, L., Cionga, C., Giurca, D., 2012, Consolidarea exploataţiilor agricole (Consolidation of the agricultural companies), pp. 65-78, http://www.april.org.ro/images/fisiere/70d7ea11a036050bf41d31b34fe674ff.pdf, Accessed on 18.09.2022.

[12]Mathijs, E., Swinnen, J..M., 2001, Production organization and efficiency during transition: an Empirical Analysis of East German Agriculture. The review of economics and statistics, Vol.83(1), 100-107.

[13]Mazumdar, 1965, Size of Farm and Productivity: A Problem of Indian Peasant Agriculture. Economica, New Series, Vol. 32(126), doi:10.2307/2552546, pp. 161-173.

[14]Manescu, C., Mateoc-Sirb, N., Otiman, P.I., Matias, C.G., Dincu, A.-M., 2004, The study of agrarian structures in the European Union, Scientific Works - Vol. 51, Agronomy series, University of Agricultural Sciences and Veterinary Medicine Iasi, pp. 144-147.

[15]Marcuta, A., Marcuta, L., Panait, R., 2021, The relationship between the circular economy and sustainable waste management in European Union, Journal of Business Administration Research, Volume 04, Issue 01, January 2021, DOI: https://doi.org/10.30564/jbar.v4i1.2709, https://scholar.google.com/scholar?cluster=4690133994597663177&hl=en&oi=scholarr, pp. 37-44, Accessed on 20.09.2022.

[16]Marcuta, L., Popescu, A., Tindeche, C., Smedescu, D., Marcuta, A., 2021, Food security of the European Union and the influence of Covid-19, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 21(2), 386-392, http://managementjournal.usamv.ro/pdf/vol.21_2/Art46.pdf, Accessed on 12.09.2022.

[17]National Institute of Statistics, 2022, Press release, no. 74/March 24, 2022, https://insse.ro/cms/sites/default/files/com_presa/com_pdf/rga_2020r.pdf, Accessed on 12.09.2022.

[18] National Institute of Statistics, Statistical Division of Dambovita County, 2022, Statistical Yearbook of Dambovita County, pp. 125-149, https://dambovita.insse.ro/wp-content/uploads/2022/02/ASDB_2022.pdf, Accessed on 14.09.2022.

[19]Popescu, A., Tindeche, C., Marcuta, A., Marcuta, L., Hontus, A., Angelescu, C., 2021, Labor force in the european union agriculture - traits and tendencies, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 21(2), 475-486, http://managementjournal.usamv.ro/pdf/vol.21_2/Art55.pdf, Accessed on 20.09.2022.

[20]Rios, A.R., Shively, G.E., 2005, Farm Size and Nonparametric Efficiency Measurements for Coffee Farms in Vietnam, American Agricultural Economics Association annual Meeting.

[21]Tindeche, C., Marcuta, A., Marcuta, L., 2014, Importance of the agricultural sector as a branch of the national economy, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 14(4), 229-305, http://managementjournal.usamv.ro/pdf/vol14_4/art45.pdf, Accessed on 19.09.2022.

[22]Ungureanu, G., The optimization of agricultural exploitation size thorught effect to adapt the agro-alimentary supply to the demand of trade, Lucrări Ştiinţifice – Vol. 51, Series Agronomy, pp. 386-391, http://www.uaiasi.ro/revagrois/PDF/2008_1_386.pdf, Accessed on 9.09.2022.