

ASPECTS REGARDING THE EVOLUTION OF THE NUMBER OF OPERATORS IN ORGANIC AGRICULTURE IN ROMANIA AND IN PRAHOVA COUNTY

Anda-Irina ANGELESCU, Ion DONA, Indira Deniz RESIT (ALIM)

University of Agronomical Sciences and Veterinary Medicine from Bucharest, Marasti Boulevard, no. 59, District 1, 011464, Bucharest, Romania, Emails: anda_irina@yahoo.com, ion_dona@yahoo.com, alimindira@yahoo.com

Corresponding author: anda_irina@yahoo.com

Abstract

This paper represents an analysis of how the number of operators in the organic agriculture sector in Romania, in general, and in Prahova County, in particular, has evolved. The analyzed interval is 2010-2019 for the world and European level and 2010-2020 for national level, period for which complete data were found. The global and European context regarding this indicator of organic agriculture was initially analyzed and interpreted and then the data regarding its evolution in Romania and in Prahova County. The following were analyzed: the evolution of the organic number producers, the number of processors, the number of importers and exporters of organic products, using documentation as a working method. The conclusions that emerge are that, in the context in which organic farming is considered the agriculture of the future, human society is increasingly concerned about the protection of the environment and the health of its members, this production system has expanded in recent years, in parallel increasing the number of operators in the system. Also, Romania followed the general trend of development of the organic agriculture sector, the Romanian farmers being motivated, in increasing number, to practice this production system. Farmers in Prahova County are no exception, being certified both for organic production in the plant and animal sector and for processing, import-export and marketing of organic production.

Key words: organic agriculture, organically cultivated areas, producers, processors, traders

INTRODUCTION

Organic farming whose theoretical foundations, as a system of agricultural production, were laid with the process of industrialization of agriculture, has established itself in recent years as the best solution to solve many problems that concern scientists [13].

Thus, it is considered the agriculture of the future [5] and the only source of "living food", contributing to maintaining the health of the population by providing clean products, without pesticides and chemical fertilizers, but richer in nutrients than the products offered by conventional agriculture [1, 2].

At the same time, organic farming contributes to maintaining and even increasing soil fertility, increasing resistance to climatic pressures such as drought and high temperatures [6].

In addition, there are other arguments in favor of the large-scale expansion of this production

system: recycling of organic waste, use of natural fertilizers and pesticides, non-use of GMOs, care for animal welfare, respect for the environment through conservation and development of biodiversity and prevention of environmental degradation [3, 12].

Of great importance is its role in the socio-cultural field, positively influencing community development, interactions between farmers and consumers and cooperation between farmers [8].

Therefore, it is no coincidence that this system of agriculture has evolved so rapidly in recent decades, especially after the Brundtland Report in 1986 showed how important it is to practice sustainable agriculture that meets the needs of the present without affecting generations. future [11].

Thus, organic farming is experiencing a sustained development worldwide, the areas cultivated in this production system evolving upwards from one year to another.

The data from Table 1 show that in 2019, as well as for the entire analyzed period, the region with the largest organically cultivated area is Oceania, with 35.88 million hectares, the average of the analyzed period being 21.8 million ha. In fact, Oceania also records the highest average annual growth rate, namely 12.8%. Oceania is followed by Europe with 16.52 million hectares and an average annual growth rate of only 5.7%, Latin America (8.29

million hectares and growth rate of 1.1%), Asia (5.91 million hectares and an annual growth rate of 10.2%), North America (3.64 million hectares and a growth rate of 4.4%) and Africa (2.03 million hectares with a growth rate of 4.4 %).

It can be noted that Europe ranks second in the world, with European policy paying particular attention to the further development of this highly dynamic sector [10].

Table 1. Evolution of organically cultivated area worldwide and by continent in the period 2010-2019

Zone/UM	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Mean	Variation coefficient	Annual growth rate
	mil ha	mil ha	mil ha	mil ha	mil ha	mil ha	mil ha	mil ha	mil ha	mil ha	mil ha	%	%
Africa	1.1	1.1	1.1	1.2	1.3	1.7	1.7	1.9	1.9	2.0	1.4	26.5	7.4
Asia	2.5	3.7	3.2	3.4	3.5	3.8	4.9	6.0	6.4	5.9	4.1	32.8	10.2
Europe	10.0	10.5	11.2	11.4	11.8	12.7	13.5	14.4	15.6	16.5	12.3	17.8	5.7
Latin America	7.5	7.0	6.9	6.7	6.8	6.9	7.5	8.0	8.0	8.3	7.3	7.9	1.1
Nord America	2.5	3.0	3.0	3.0	2.5	3.0	3.1	3.2	3.3	3.6	3.0	12.2	4.4
Oceania	12.1	11.4	11.4	17.3	22.9	22.3	27.3	35.9	36.0	35.9	21.8	46.8	12.8
Total mondial	35.7	36.7	36.8	43.7	48.7	50.4	58.1	69.4	71.2	72.3	50.1	29.3	8.1

Source: FIBL, 2021, Statistical data, www.fibl.org, Accessed on March 10, 2021 [4].

Along with the development of the organic agriculture sector, the parallel development of the organic products market is noticeable, its growth being generated by the growing demand of consumers of organic products. It can be noticed that a high consumption of organic products is registered in the countries with developed economy, where the living standard of the population is high. Thus, worldwide, in 2019, the highest consumption of organic products per capita is recorded in: Denmark (344 €/head), Switzerland (338

€/head), Luxembourg (264 €/head), Austria (215 €/head) (Table 2).

Denmark also records the highest average of the period 2010-2019, namely 198.9 €/head. Romania, in 2019, recorded a consumption of only 2 €/head, although the annual growth rate is 14.9%.

Moreover, it should be noted that the Romanian market for organic products did not provide enough data to make a correct assessment of the situation at a given time.

Table 2. Evolution of consumption of organic products per person, in the countries with the highest consumption, in the period 2010-2019

Zone/UM	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average	Variation coefficient	Annual growth rate
	€/pers	€/pers	€/pers	€/pers	€/pers	€/pers	€/pers	€/pers	€/pers	€/pers	€/pers	%	%
Austria	118	127	126	125	148	158	177	196	205	215	153.3	23.8	6.9
Belgium	30	30	35	38	40	48	53	56	61	68	43.4	30.6	9.5
Denmark	142	142	158	163	162	190	243	278	312	344	198.9	37.8	10.3
Finland	14	30	37	39	41	43	49	56	60	66	41.0	37.1	18.8
France	52	57	61	66	73	83	100	118	136	173	82.9	47.8	14.3
Germany	73	82	86	92	96	106	116	122	131	144	100.4	22.9	7.8
Italy	26	28	31	33	35	38	43	51	57	59	38.0	31.4	9.5
Luxemburg	129	133	142	156	163	166	188	203	221	264	166.8	25.7	8.3
The Neatherland	39	41	47	54	57	58	62	64	68	71	54.4	20.1	6.9
Norway	29	30	40	54	63	68	75	79	79	82	57.4	35.8	12.2
Romania	0	0	0	0	1	1	2	2	2	2	0.9	106.1	14.9
Spain	19	20	21	21	25	32	36	42	46	46	29.1	37.9	10.3
Sweden	86	96	95	108	141	194	224	237	230	214	156.8	40.2	10.7
USA	55	57	69	74	82	109	118	122	124	136	90.0	33.8	10.6

Source: FIBL, 2021, Statistical data, www.fibl.org, Accessed on March 10, 2021 [4].

As a volume of the total market value for organic products, Germany stands out, which in 2019 reached a level of 11,970 million Euros and France with 11,295 million Euros. France also recorded a high average annual growth rate of 14.3%. Romania has the

highest average annual growth rate, 19.6%, although the Romanian market for organic products is a small, emerging market. Finland (18.8%), Norway (13.4%) and Sweden (11.5%) also recorded high growth rates in the period 2010-2019 (Table 3).

Table 3. Evolution of the market value of organic products in the countries with the highest consumption in the period 2010-2019

Zone/UM	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average	Variation coefficient	Annual growth rate
	mil €	mil €	mil €	mil €	mil €	mil €	mil €	mil €	mil €	mil €	mil €	%	%
Austria	986	1,064	1,064	1,064	1,260	1,360	1,541	1,723	1,810	1,920	1,319.1	26.4	7.7
Belgium	333	340	391	424	438	536	600	627	698	779	487.4	31.8	9.9
Canada	1,903	1,903	2,135	2,375	2,523	2,757	3,001	3,001	3,118	3,480	2524.0	21.4	6.9
Denmark	791	881	887	917	912	1,079	1,392	1,600	1,807	1,978	1,140.7	38.2	10.7
Finland	80	163	202	215	225	240	273	309	336	378	227.0	38.3	18.8
France	3,384	3,764	4,020	4,383	4,830	5,534	6,736	7,921	9,559	11,295	5,570.1	48.1	14.3
Germany	6,020	6,440	6,970	7,420	7,760	8,620	9,478	10,340	10,910	11,970	8,217.6	24.5	7.9
Italy	1,550	1,720	1,885	2,020	2,145	2,317	2,644	3,137	3,483	3,625	2,322.3	31.8	9.9
Luxemburg	65	68	75	84	90	94	108	122	129	160	92.8	32.6	10.5
The Neatherlands	656	697	781	912	890	991	1070	1103	1164	1211	918.2	21.1	7.0
Norway	142	149	201	276	325	351	394	418	422	441	297.6	38.4	13.4
Romania	8	10	11	14	24	24	40	40	40	40	23.4	59.2	19.6
Span	906	965	998	1,018	1,203	1,498	1,641	1,903	2,133	2,133	1,362.8	35.9	10.0
Sweden	803	908	905	1,029	1,363	1,892	2,207	2,366	2,300	2,143	1,530.3	42.5	11.5

Source: FIBL,2021, Statistical data, www.fibl.org, Accessed on March 10, 2021 [4].

In terms of the market share of organic products, in the total food market, the highest share, on average of the period 2010-2019, is recorded in Denmark, ie 7.8% of the total food market. Denmark is followed by Austria with 6.9%, Sweden with 5.9% and Luxembourg with

4.9%. The highest annual growth rates were recorded in the Netherlands, 16.7%, followed by France and Italy and Belgium with 13% (Table 4).

Table 4. Evolution of the share of the market value of organic products, in the total food market, in the countries with the highest consumption, in the period 2010-2019

Area/UM	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Average	Variation coefficient	Annual growth rate
	%	%	%	%	%	%	%	%	%	%	%	%	%
Austria	6	6	6	6	7	7	8	8	8	9	6.9	16.0	4.6
Belgium	1	1	1	1	2	1	2	2	3	3	1.6	52.9	13.0
Canada	2	2	2	2	2	2	2	2	2	3	2.0	15.8	4.6
Denmark	6	6	6	7	7	8	9	10	11	12	7.8	28.3	8.0
Finland	1	1	1	1	1	1	1	2	2	2	1.2	39.5	8.0
France	2	2	2	2	2	2	3	4	4	6	2.6	53.6	13.0
Germany	3	4	4	4	4	4	4	5	5	5	4.1	15.4	5.8
Italy	1	1	1	2	2	2	3	3	3	3	2.0	43.8	13.0
Luxemburg	3	3	4	4	5	5	6	7	7	8	4.9	35.8	11.5
The Neatherlands	1	2	2	2	3	4	4	4	4	4	2.9	40.0	16.7
Norway	1	1	1	1	1	1	1	1	1	1	1.0	0.0	0.0
Spain	0	0	0	1	1	1	1	2	2	2	0.9	91.9	12.2
Sweden	4	4	3	4	6	7	7	9	9	9	5.9	39.9	9.4

Source: FIBL,2021, Statistical data, www.fibl.org, Accessed on March 10, 2021 [4].

For Romania, organic farming is an important niche in agriculture which could support the farmers who are interested to carry out organic products respecting the EU legislation

in the field, as due to their high quality these products are more and more preferred by consumers and prices are higher than for the products achieved in the conventional

agriculture assuring a higher income and profit therefore a higher farming efficiency [9].

In this context, the purpose of the paper was to analyze the dynamics of the number of operators in organic farming (producers, processors, traders etc), the cultivated areas, the value of organic products in the world, the EU and Romania and also in Prahova County in the period 2010-2019.

MATERIALS AND METHODS

Following the above, we can say with certainty that in economically developed countries, with a high standard of living, organic farming has developed much faster than in countries with a less developed economy. As we have seen, this is clearly manifesting itself at European level. This article highlights a series of aspects regarding the indicators of organic agriculture in Romania and in Prahova County with the help of an analysis of the evolution of the number of operators in the sector, in comparison with the existing situation at European level. The analysis is based on statistical data provided by Eurostat and FIBL for the situation at World and European level and, in addition, for the situation in Romania and Prahova County, based on data available on the Ministry of Agriculture and Rural Development website. The interpretation of the data was performed, using as statistical indicators: the average, the coefficient of variation, then calculating the annual growth rate of the period.

RESULTS AND DISCUSSIONS

At the level of the European Union, the main indicators analyzed were: the area cultivated in organic system, the number of producers in the system, the total value of organic production, the value of production per ha and the value of production per producer in organic system.

In the period 2010-2019 the growth rate for the organically cultivated area was 5.4% and the coefficient of variation was 16.6%. The number of producers in the system had a

growth rate comparable to that of the surface, ie 5.1%, the coefficient of variation being 14.5% (Table 5).

Table 5. Evolution of the main indicators of organic farming in the European Union, in the period 2010-2019

Year/UM	Organic area	Producers	Total value	Value/ha	Value/producer
	Thousand ha	No.	mil €	Hundreds €/ha	Hundreds €/prod
2010	9,074	220,421	18,029	1.99	81.8
2011	9,469	236,009	19,642	2.07	83.2
2012	9,980	253,381	20,852	2.09	82.3
2013	10,170	256,432	22,115	2.17	86.2
2014	10,383	256,272	23,895	2.30	93.2
2015	11,135	269,111	27,350	2.46	101.6
2016	12,048	295,123	30,801	2.56	104.4
2017	12,820	305,610	34,637	2.70	113.3
2018	13,763	327,631	38,384	2.79	117.2
2019	14,580	343,858	41,452	2.84	120.5
Average	11,342	276,385	27,716	2	98
Variation coefficient (%)	16.6	14.5	29.8	13.2	15.3
Grow rate (%)	5.4	5.1	9.7	4.1	4.4

Source: FIBL,2021, Statistical data, www.fibl.org, Accessed on March 10, 2021 [4].

The total market value of organic products registered a higher coefficient of variation of 29.8%, and the growth rate was 9.7%. For the value calculated per ha of organic products, the coefficient of variation was 13.2% and the growth rate of 4.1%. Another indicator, the value per producer, registered a coefficient of variation of 15.3% and a growth rate of 4.4%. The same indicators analyzed for Romania reveal the following aspects (Table 6):

- The area under organic farming had a higher coefficient of variation and growth rate than those recorded at EU level of 21.8% and 9% respectively;
- The number of producers also recorded a higher coefficient of variation and growth rate than at EU level, namely: 35.7% and 13.4% respectively;
- The total market value registered a coefficient of variation of 25% and the growth rate 53.3%, higher than those at EU level;
- The average value per hectare of organic products registered in Romania is only 0.091 thousand euro, unlike the average registered at

EU level, of 2 thousand euro / ha. However, the coefficient of variation is 54.03% and the growth rate is 9.1%, higher than those recorded at EU level.

Table 6. The evolution of the main indicators of agriculture in organic system in Romania in the period 2010-2019

Year/UM	Organic area	Producer	Total value	Value /ha	Value/producer
	ha	No.	Mil. €	Hundreds €/ha	Hundreds €/prod
2010	182,706	2,986	8	0.046	2.67
2011	229,946	9,471	10	0.043	1.05
2012	288,261	15,280	11	0.038	0.71
2013	301,148	14,553	14	0.046	0.96
2014	289,251	14,151	24	0.082	1.69
2015	245,924	11,812	24	0.097	2.03
2016	226,309	10,083	40	0.176	3.96
2017	258,471	7,908	40	0.154	5.05
2018	326,260	8,518	40	0.122	4.69
2019	395,228	9,277	40	0.101	4.311
Average	274,350	10,404	25	0.091	2.7
Variation coefficient (%)	21.8	35.7	55.3	54.03	61.3
Grow rate (%)	9.0	13.4	19.6	9.1	5.5

Source: MARD, 2021, Organic agriculture (Agricultura ecologica) 2017-2020, Accessed on March 10, 2021 [7].

The analysis of the evolution of organic agriculture operators in Romania in recent years (2017-2020), by types of activities highlighted the following:

- The average of the period 2017-2020 for the number of producers in the system is 8,242. The coefficient of variation is 8.5% and the annual growth rate is 4.74%;
- For the category of processors, the average of the period 2017-2020 is 149, the coefficient of variation 22.5% and the growth rate is 11.42%;
- Operators selling organic products recorded an average of 273, a coefficient of variation of 21.7% and a growth rate of 5.94%;
- For operators operating in the spontaneous flora, the average of the period is 31, the coefficient of variation 18.7% and the growth rate is negative, -9.74%, registering a decrease in their number;
- The same situation is registered in the case of operators in organic aquaculture, with a negative growth rate of -36.10%;

- Importers and exporters in the organic production system also show negative growth rates, ie -20.63% for exporters and -6.47% for importers (Table 7).

Table 7. Evolution of the number of operators in organic agriculture, by types of activities in Romania, during 2017-2020

Operators/UM	2017	2018	2019	2020	Media	Stand. dev.	Variation coefficient (%)	Growth rate (%)
	No.	No.	No.	No.	No.			
Producers	7,381	8,069	9,035	8,481	8,242	697	8.5	4.74
Processors	120	121	187	166	149	33	22.5	11.42
Traders	233	226	355	277	273	59	21.7	5.94
Spontaneous flora	34	38	28	25	31	6	18.7	-9.74
Acviculture	23	32	11	6	18	12	65.3	-36.10
Importers	11	13	15	9	12	3	21.5	-6.47
Exporters	4	4	3	2	3	1	29.5	-20.63
Total	7,806	8,503	9,634	8,966	8,727	770	8.8	4.73

Source: MARD, 2021, Organic agriculture (Agricultura ecologica) 2017-2020 [7].

Prahova County, famous for its tradition in the wine sector, has the advantage of having a wide variety of landforms that provide favorable conditions for cereals, fruit trees, animal husbandry and forestry. In the county are organically cultivated areas that represent approximately 1.06% of the total agricultural area, organically cultivated, at the country level. The operators of the ecological system cultivate cereals and other field crops, vegetables, meadows, alfalfa, permanent crops (fruit trees, shrubs), vines, sea buckthorn, medicinal plants. Also, a number of 24 operators owned, at the level of 2018, a number of 3,069 bee families [7].

The evolution of the operators from the ecological agriculture system from Prahova county, in the period 2017-2020, had the following route (Table 8):

- The number of producers increased from 40 in 2017 to 60 in 2020, the average for the period being 58. The annual growth rate was 14.47%;
- The number of processors also increased, the average of the period being 7, and the annual growth rate of 10.6%. They process: honey and bee products, bakery products (bread, puff pastry, pretzels), wines, cocktails.

- For the traders of ecological products the growth rate was lower, of only 4%, the average of the analyzed period being of 9.
- For the export activity in 2017, 2 operators were certified and from 2018 to 2020 only one operator remained in activity, which delivers pollen for export. So the growth rate in this segment of ecological operators is negative, -29.29%.
- From the evolution of the operators in Prahova County it can be noticed the average of the period of 75 and the fact that their number increased from 56 in 2017, to 77 in 2020. The registered growth rate is 11.2%.

Table 8. Evolution of the number of operators in organic agriculture, by types of activities in Prahova county, during 2017-2020

Operators/ UM	2017	2018	2019	2020	Average	Standard deviation	Variation coeff. (%)	Growth rate (%)
	No.	No.	No.	No.	No.	No.	%	%
Producers	40	68	65	60	58	13	21.6	14.47
Processors	6	5	8	8	7	2	22.2	10.06
Commerce	8	8	9	9	9	1	6.8	4.00
Export	2	1	1	1	1	1	43.3	-29.29
Total	56	82	83	77	75	13	16.9	11.20

Source: MARD, 2021, Organic agriculture (Agricultura ecologica) 2017-2020 [7].

CONCLUSIONS

At European level there are important changes in the organic farming sector that can be highlighted:

- The organic farming sector has generally experienced a large development in the period 2010-2019. This is characteristic for the ecologically cultivated area but also for the number of producers, whose growth rate was 5.1%, close to that of cultivated areas, 5.4%.
- In Romania there was the same trend of increasing the cultivated areas and the number of producers, in the period 2010-2019, the growth rates being higher than those registered at European level.
- The average of the period 2010-2019 for producers in the organic farming system in Romania (13.4%) is higher than the average of the period of 2017-2020 (4.74%).

-In the structure of operators, by types of activities there were positive growth rates for the categories of producers, processors and traders.

-In Prahova County, most operators in organic agriculture are in the category of producers, the growth rate of their number (14.47%) being higher than that recorded nationally (4.74%).

-The category of processors in Prahova County also registered a high growth rate (10.06%), lower than the one registered at national level (11.42%)

As a general conclusion, we can say that the organic farming sector in Romania, in general, and in Prahova County, in particular, has a chance to become a strong sector, given that the National Strategic Plan 2021-2027, provides for growth the area cultivated in an ecological system at 15-20%, this desideratum being supported by the allocation of an amount of 550 million euros.

REFERENCES

- [1]AFSSA, 2003, Evaluation nutritionnelle et sanitaire des aliments issus de l'agriculture biologique, www.anses.fr/fr/system/files/NUT-Ra-AgriBio.pdf, Accessed on February 15, 2021.
- [2]Alim, I., Lup, A., 2019, Organic farming: from definitions and concepts to the agricultural business and even politics, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 19(2):11-15.
- [3]Davidescu, D., Davidescu, V., 1994, Biologic agriculture - an alternative for small and middle sized holdings (Agricultura biologică - o variantă pentru exploatarea mică și mijlocie), Ceres Publishing House, Bucharest, pp. 11.
- [4]FIBL, 2021, Statistical data, www.fibl.org, Accessed on March 10, 2021.
- [5]Ionescu, A., 1982, Organic agriculture (Agricultura ecologică), Ceres Publishing House, Bucharest, pp. 62.
- [6]Kate, S., Tautges, N., Li, M., Gaudin, A., Ranch, R., 2019, Sustainable Agriculture Facility, Agricultural Sustainability Institute, University of California Davis, USA, daretocompare.ussoy.org/-1.pdf, Accessed on October 12, 2020.
- [7]MARD, 2021, Organic agriculture (Agricultura ecologica) 2017-2020, www.madr.ro, Accessed on April 4, 2021.
- [8]Mendoza, T. C., 2004, Evaluating the benefits of organic farming in rice agroecosystems in the Philippines, J. Sustain. Agr. 24, 93-115.
- [9]Pascu, A.D., 2013, Evolution of organic agriculture in Romania and its importance in sustainable rural

development, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 13(2):313-318.

[10]Popescu, A., Pop, C., 2013, Considerations regarding the development of organic agriculture in the world, the EU-27 and Romania, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 13(2):323-329.

[11]Report of the World Commission on Environment and Development: Our Common Future, sustainabledevelopment.un.org/documents/5987our-common-future.pdf 6, Accessed on March 26, 2021.

[12]Roljevic, S., Vukovic, P., Grujic, B., 2014, The role of organic agriculture in the conservation of genetic resources and increasing agrodiversity, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 14(2):241-246.

[13]Toncea, I. et al., 2011, Textbook of organic farming (Manual de agricultură ecologică) (suport de curs), National Programme of Rural Development-NPRD.

