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ANALYSIS OF THE ECOLOGICAL AGRICULTURE SECTOR IN THE REPUBLIC OF MOLDOVA

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Abstract: *The general purpose of this article is the analysis of the organic agriculture sector in the Republic of Moldova, determining the place of this sector in the national economy, as well as highlighting the advantages and disadvantages of this sector. In the process of developing this article, such research methods as statistical analysis of existing data, comparative analysis, synthesis of existing information, deduction method, and SWOT analysis were applied. Following the use of research methods, quantitative parameters were established that define the place of organic agriculture in the economy of the Republic of Moldova, the importance of organic agriculture in particular in the current conditions of agricultural development that involve such factors as: climate change, environmental pollution, inefficient use and abuse of natural resources, etc. The industrial model of agricultural intensification widely used in the last decades did not ensure a sustainable development of the agricultural sector. As a result, organic agriculture is gaining more and more importance and demonstrates dynamic development trends. The practice of organic farming is dictated by market demand, with consumers increasingly demanding healthy, organic, naturally grown agricultural and food products.*

Keywords: *ecological agriculture, ecological agricultural product, economic analysis*

JEL classification: Q10, Q13, Q15

INTRODUCTION

Organic farming offers a number of advantages compared to conventional farming. These advantages can benefit both agricultural producers and consumers of these products, as well as all participants in the food chain that mediates production and consumption. Among the main advantages, the following can be mentioned: a) a higher level of income compared to conventional agriculture, caused by a lower consumption of agricultural inputs; respectively and b) a lower level of dependence on input imports, mainly chemical fertilizers and protection means. This results in a less polluted environment, greater biodiversity and an increase in the amount of humus in the soil. Organic production is healthier for human consumption and ensures a higher level of sustainability compared to conventional production. At the same time, organic production in the Republic of Moldova faces certain problems and difficulties that prevent or do not allow a more massive development in this sector with a high development potential. The analysis of the organic agriculture sector made in this article makes an attempt to highlight these advantages and disadvantages including the main actors in the organic agricultural production chain. In the article, a brief presentation of the inspection and certification bodies operating in the Republic of Moldova was made. The SWOT analysis presents the results of these analyses in a more concise and visible way. The respective conclusions and recommendations aim to provide a more applicable character to the materials presented in the given article.

MATERIAL AND METHOD

In the process of developing this article, such research methods as statistical analysis of existing data, comparative analysis, synthesis of existing information, deduction method, and SWOT analysis were applied. Data for analysis were collected from the open secondary sources accessed via the INTERNET. Data analysis was performed using the standard functions available in the Excel program.

RESULTS AND DISCUSSIONS

Organic agriculture - is a relatively new field, but also quite interesting and attractive for agricultural producers in the Republic of Moldova. The first attempts at ecological agricultural production date back to 2003. In the meantime, these areas have expanded so that in 2020 they reach already about 29 thousand hectares, according to the data presented by MAIA¹. The unusual jump in the areas occupied by ecological agricultural production in 2017 is due to dishonest manipulations by some certification companies carried out in collaboration with certain economic agents and possibly with responsible persons from the Republic of Moldova. But, the analysis of these manipulations is not the subject of this article and will be analysed in another paper.

At the same time, using international publications in the field as a source of information, we can observe some quite significant discrepancies between the figures provided by MAIA and those provided by FIBL² regarding the areas occupied by organic agricultural crops in the Republic of Moldova. These discrepancies are quite small, of the order of 1 hundred hectares in 2016 and up to about 45.6 thousand ha in 2017 (see figure 1).

This makes the estimates regarding the surfaces occupied by organic crops to be made much more rigorously and thoroughly in order to avoid mechanical errors. There are also differences regarding the dynamics of the areas occupied by organic agricultural crops in the FIBL and MAIA version.

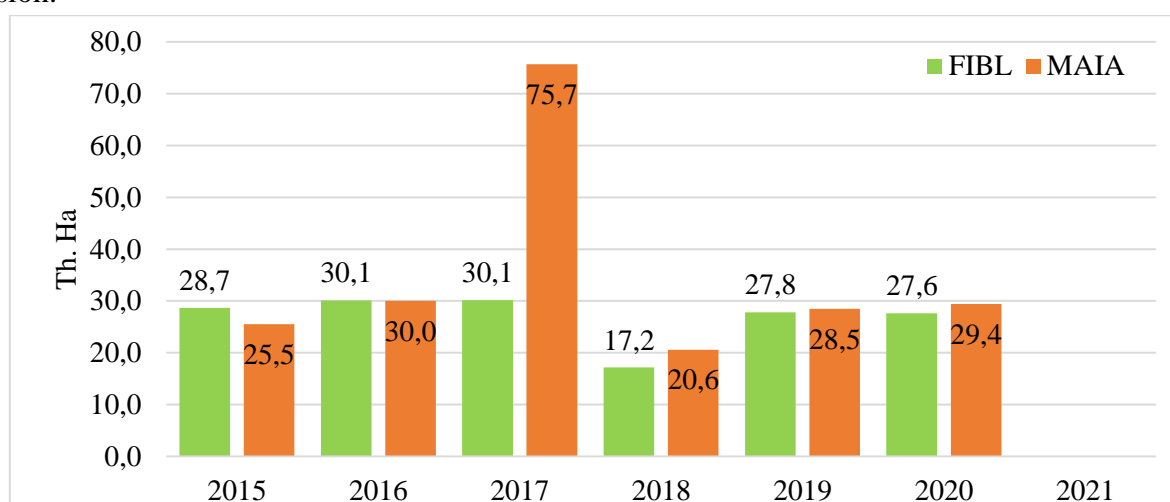


Figure 1. Areas occupied by organic production in the Republic of Moldova according to MAIA and FIBL data, 2015-2020, thousand ha.

Source: Prepared by the authors based on MAIA (2022) and FIBL (2017-2022) data

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All these divergences make the estimation of the areas occupied by organic crops in the Republic of Moldova a little more confusing.

The share of areas occupied by ecological agriculture in the total volume of agricultural land in the Republic of Moldova is quite small and varied between 2015-2020 around 1.7% according to MAIA data and around 1.3% according to FIBL. More than that, according to MAIA data, the areas occupied by ecological agriculture increased during this period by about 15%, but according to FIBL data, these areas decreased by about 4% (see table 1).

Table 1. Dynamics of the share of ecological agricultural production areas in the Republic of Moldova according to MAIA and FIBL data, 2015-2020, ha, %

	2015	2016	2017	2018	2019	2020	2020/2015, %	Average 2015-2020
The total agricultural area of the Republic of Moldova (thousand ha)	2026.5	2028.3	2039.8	2041.6	2073.0	2092.0	102.5	2050.2
The area occupied by organic agriculture, according to MAIA (thousand ha)	25.5	30.0	75.7	20.6	28.5	29.4	115.3	35.0
Share, %	1.26	1.48	3.71	1.01	1.37	1.41	139.3	1.7
The area occupied by organic agriculture, according to FIBL (thousand ha)	28.7	30.1	30.1	17.2	27.8	27.6	96.2	26.9
Share, %	1.42	1.48	1.48	0.84	1.34	1.32	93.2	1.3

Source: developed by the authors based on data from the State Cadastre, FIBL and MAIA

Comparing the share of the areas occupied by organic agriculture in the Republic of Moldova with the same indicator at the global level, it can be observed that it lags behind the global trends. Thus, at the global level, the share of the areas occupied by agricultural production increased by about 33% in the period 2015-2020, while in the Republic of Moldova this indicator indicated a stagnation in the same period. It becomes even more obvious that the Republic of Moldova is lagging behind in the field of organic production when we compare it with the indicators in Europe, in the EU countries, or with certain countries in Europe, where this sector of agriculture has experienced a much more impressive development. According to the situation in 2020, the average share of the land occupied by organic agriculture on the European continent was 3.4%, registering an increase of about 126% compared to 2016. This indicator is even more impressive in EU countries, where the share of the land occupied by organic agriculture was of 9.2% in 2020, increasing by about 41% compared to 2016.

Among the most advanced countries in Europe in the field of organic production, one can mention Austria, Estonia, Switzerland, the Czech Republic, Latvia, Slovenia, Germany and Spain, where the share of land involved in the organic circuit varied in 2020 between 10.0% (Spain) and 26.5% (Austria).

The growth rate of the share of land involved in the organic circuit was particularly impressive in Romania, where it increased more than twice in the period 2015-2020, in France by 60%, in Germany by 36% and in the Czech Republic by 33%.

Against this impressive background, the results of the Republic of Moldova with a share of land occupied by ecological agriculture of 1.2% and with zero growth in the period 2015-2020 look very unimpressive, a fact that demonstrates the attitude towards this sector both at the micro level and at the macro level (see table 2).

Table 2. The dynamics of the share of organic agricultural production areas globally, and in selected European countries. 2016-2020, %

	2016	2017	2018	2019	2020	2020/2016, %	Average, 2016-2020
Globally	1.2	1.4	1.5	1.5	1.6	133.3	1.4
Europe	2.7	2.9	3.1	3.3	3.4	125.9	3.1
EU, total	6.5	7.2	7.4	8.1	9.2	141.5	7.7
Austria	21.9	24.0	26.7	26.1	26.5	121.0	25.0
Estonia	18.9	20.5	21.6	22.3	22.4	118.5	21.1
Switzerland	13.5	14.4	15.4	16.5	17.0	125.9	15.4
Czech Republic	11.5	12.2	12.8	15.4	15.3	133.0	13.4
Latvia	14.3	14.8	15.4	14.8	14.8	103.5	14.8
Slovenia	9.0	9.5	9.9	10.3	10.8	120.0	9.9
Germany	7.5	8.2	9.1	9.7	10.2	136.0	8.9
Spain	8.7	8.9	9.6	9.7	10.0	114.9	9.4
France	5.5	6.3	7.3	7.7	8.8	160.0	7.1
Lithuania	7.6	8.1	8.3	8.1	8.0	105.3	8.0
Romania	1.7	2.0	2.5	2.9	3.5	205.9	2.5
Montenegro	1.5	1.2	1.9	1.8	1.9	126.7	1.7
Moldova	1.2	1.2	0.7	1.2	1.2	100.0	1.1
Ukraine	0.9	0.7	0.7	1.1	1.1	122.2	0.9
Azerbaijan	0.8	0.8	0.8	0.8	0.8	100.0	0.8
Georgia	0.1	nd	0.1	0.1	0.1	100.0	0.1

Source: developed by the authors based on FIBL data

The analysis of the areas occupied by organic crops in the profile of the development regions demonstrates that the largest areas are located in the Central region with about 14.5 thousand ha in 2020. This is followed by the North region with about 10.6 thousand ha and the South region with 4, 2 thousand ha. Subsequently, regarding the situation in 2020, about 51% of the organic agricultural areas were concentrated in the Central region, 37% in the Northern region and about 15% in the Southern region.

Compared to 2019, these areas have undergone certain changes, so in the Central region, these areas have decreased by about 16%. In the same period, the areas of organically cultivated crops increased in the North region by about 11%, and in the South region by about 2.5 times (see figure 2).

The distribution of the areas occupied by crops grown according to organic standards in different districts of the Republic of Moldova is quite unclear and inhomogeneous. While some districts have registered several thousand hectares of such crops, others do not have at all or do not report on the presence of organic producers on the territory of the respective administrative units. Thus, several groups of districts can be highlighted according to the size of these areas. In the first group can be included the districts (administrative units) where from one thousand to about 7000

thousand hectares of organic agricultural crops were registered. These are the districts: Bender, Soroca, Chisinau, Cahul, Sangerei, Hâncești, and Glodeni. The average area per district in this group is about 3000 ha., with deviations from about 1000 ha in Glodeni district to about 6700 ha in Bender district. At the same time, certain questions arise regarding the large fluctuations in the 2019-2020 period of these areas in the districts of Chisinau, Cahul, Sângerei, which can only partially be explained either by the fact that certain areas were only in the conversion period or that the certification period has already expired.

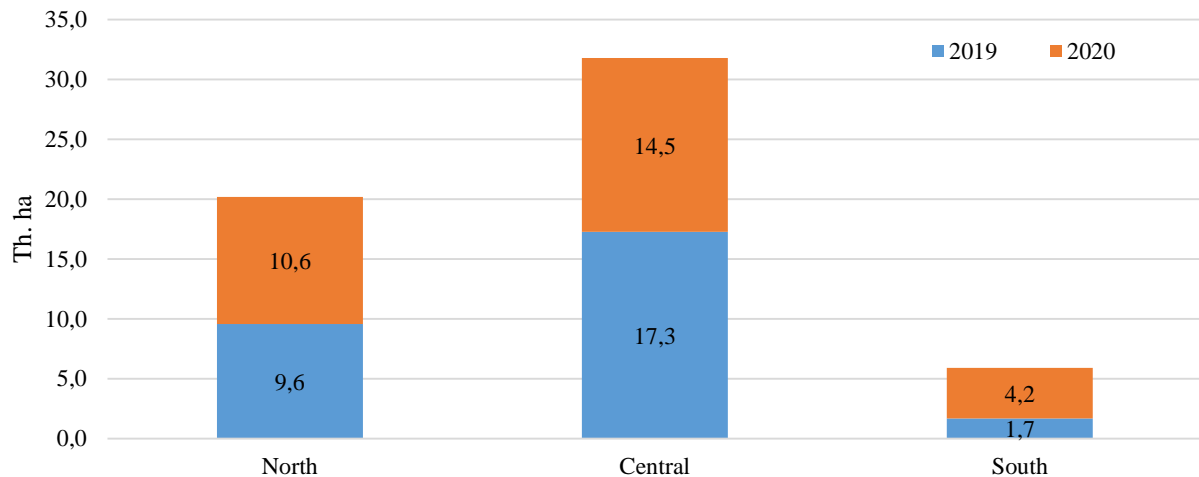


Figure 2. Areas occupied by organic production by development regions, 2019-2020, Ha.

Source: Developed by authors based on Ecovisio data (2022)

The second group of districts are those that have from a few tens to a thousand hectares of organically cultivated land. This is the largest group and includes 24 districts: Anenii Noi, Basarabeasca, Briceni, Călărași, Cantemir, Căușeni, Criuleni, Dondușeni, Drochia, Dubăsari, Edineți, Fălești, Florești, Ialoveni, Leova, Orhei, Rezina, Râșcani, Soldănești, Stefan Voda, Telenesti, UTA¹ Transnistria, Ungheni and UTA Gagauzia. The average area per district in this group is about 300 ha., with deviations from about 10 ha in the Cantemir district to about 700 ha in the Dondușeni district.

And the last group consists of 6 districts, namely: Bălți, Cimișlia, Nisporeni, Ocnîța, Strășeni and Taraclia, which either do not have land cultivated in organic regime, or do not report such data (Ecovisio, 2022).

In 2020, most of the land occupied by organic production (about 75%) was already certified according to organic production standards, compared to about 79% in 2019. In absolute numbers, the areas of already certified organic constituted about 22.5 thousand Ha in 2019 and about 22.1 thousand ha in 2020, registering a slight decrease of about 1.7% in 2020 compared to 2019. About 5% of the organic fields were in the first year of conversion in 2020, compared to about 9% in 2019. About 19% were in the II year of conversion in 2020 compared to about 12% in 2019 and only about 1% were in the III year of conversion in 2020. Thus it can be seen that a share of about 25% of the land cultivated organically in 2020 was in different phases of conversion, which creates a significant potential for the increase of organically certified areas in the following years (see figure 3).

¹ UTA – Autonomous Territorial Unit

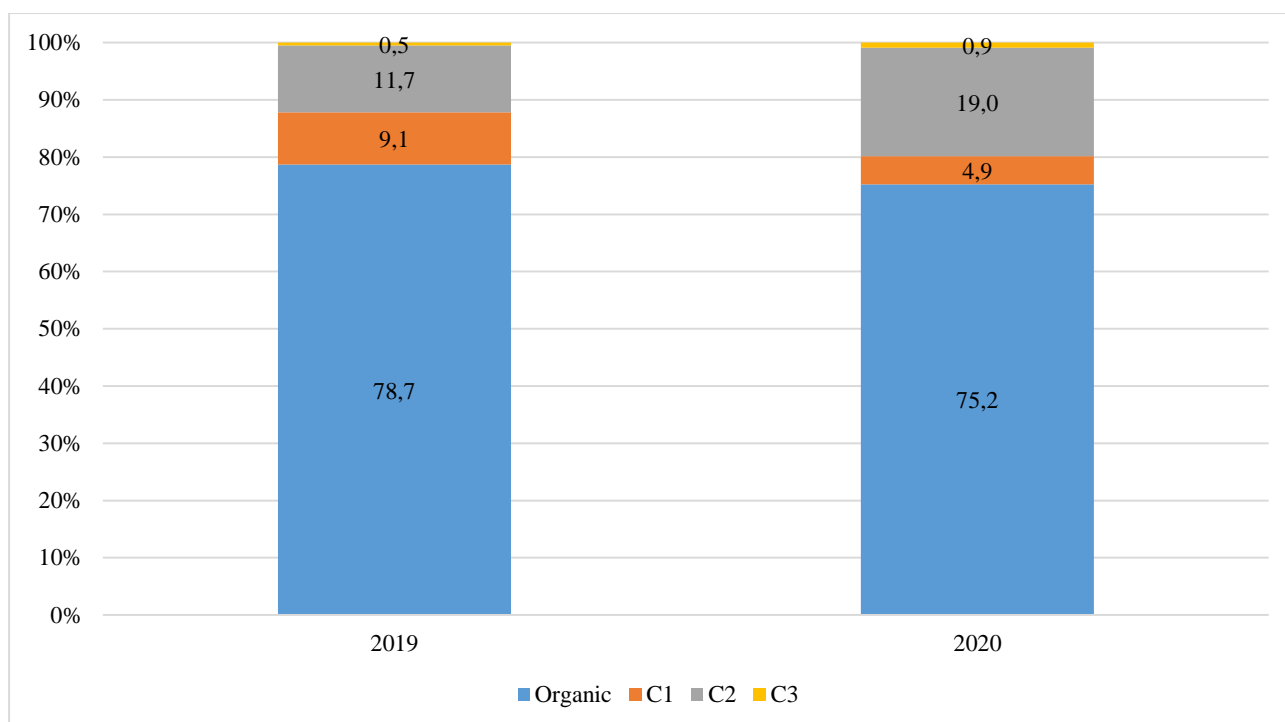


Figure 3. Structure of cultivated areas by status, 2019-2020, %

Source: Developed by authors based on Ecovisio data (2022)

The main crops grown organically in the Republic of Moldova are cereals and oilseeds, which in 2020 occupied about 42% and 32% of the total areas occupied by organic agriculture, respectively. It should be noted that during the period 2016-2020, the areas occupied by ecologically cultivated cereal crops decreased by about 42%. In the same period, the areas cultivated ecologically with oil crops increased by about 2.1 times, those occupied by leguminous crops by about 2.9 times, those by fruits by about 2.2 times, and the areas occupied by organically grown grapes by about 5.9 times (see table 3).

Table 3. The dynamics of the areas occupied by different crops in an ecological regime, 2016-2020, ha

	2016	2017	2018	2019	2020	2020/2016, %	Share in 2020, %
Cereals	20097	20097	3541	11401	11607	57.8	42.1
Oil crops	4183	4183	3720	9192	8852	211.6	32.1
Leguminous	515	515	1133	1658	1490	289.3	5.4
Fruits	279	279	177	656	619	221.9	2.2
Grapes	7	7	5	18	41	585.7	0.1
Vegetables	109	109	6	18	2	1.8	0.0
Other crops	4910	8910	8618	3757	4989	101.6	18.1
Total	30100	34100	17200	26700	27600	91.7	100.0

Source: Developed by authors based on FIBL data (2017-2022)

In the period 2019-2020, 10 inspection and certification bodies activated in the Republic of Moldova, namely: A Cert, AGRECO, Bio Inspecta, CERES, Certificat ECO, Control Union Dnjestr (CUD), Ecocert, KIWA BCS, Organic Standard and STC. Most organic farms were certified by

Control Union Dnjestr (41 units in 2020) and ECO Certificate (42 units in 2020). They are followed at some distance by AGRECO (28 units in 2020) and KIWA BCS (10 units in 2020). The other inspection and certification bodies certified a considerably smaller number of organic farms (see figure 5).

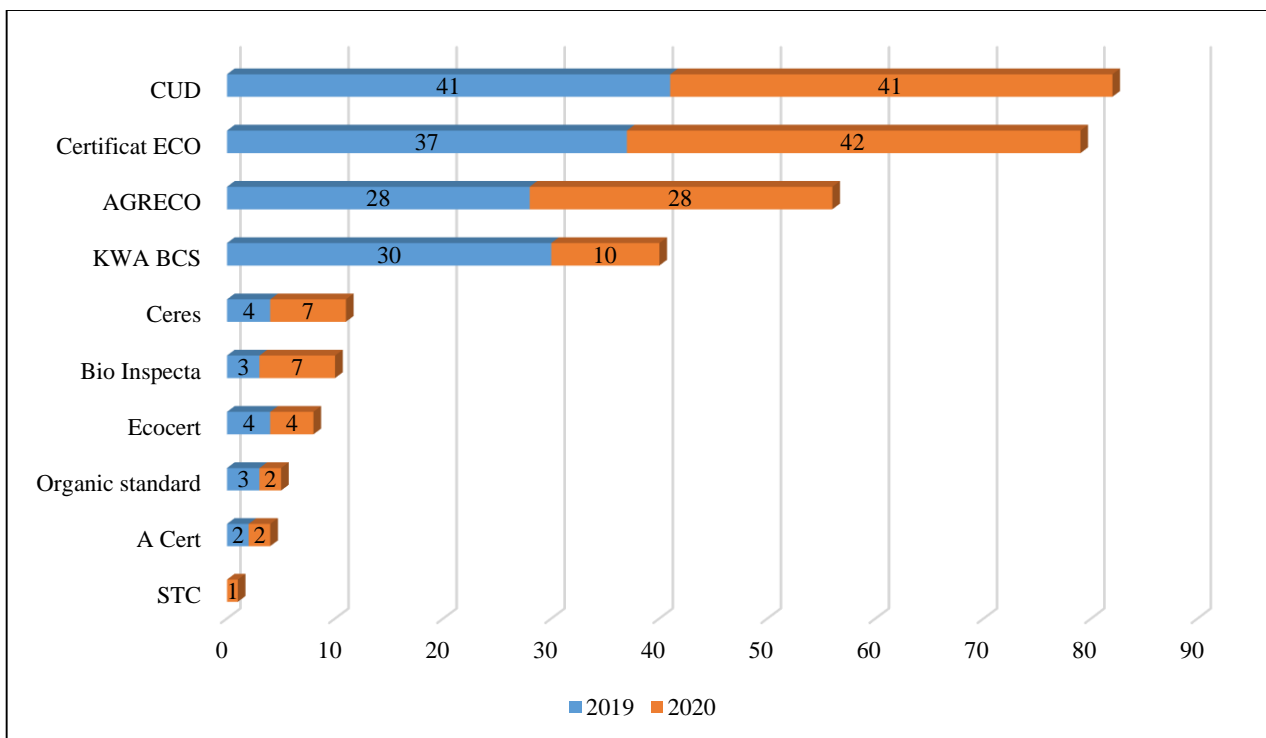


Figure 4. Accredited certification institutions by the number of certified agricultural holdings in the Republic of Moldova, 2019-2020.

Source: Developed by authors based on Ecovisio data (2022)

The biggest problem in the activity of these inspection and certification bodies lies in the fact that according to the legislation in force, only organic farms certified by the national authorities can benefit from the subsidies offered by the Agency for Interventions and Payments in Agriculture, but these institutions are not recognized abroad of the Republic of Moldova. At the same time, in order to be able to export ecological products, importers request the certification of producers by a recognized entity, from abroad of the Republic of Moldova. But certification by these international bodies is not recognized by the Agency for Interventions and Payments in Agriculture as valid for applying to subsidies for organic production. Thus, organic agricultural producers face a problem with several unknowns: either they export the organic products, but are not accepted for the subsidy program, or vice versa - they accept the subsidies but cannot export, or the last option - be certified by a local body and an international one, which implicitly raises the certification costs.

Following the analysis of the materials presented in the given article, the identification of the strong and weak parts of the risks and opportunities of ecological agricultural production in the Republic of Moldova was carried out. They are briefly presented in the table below.

Table 4. SWOT analysis of organic production in the Republic of Moldova

STRONG PARTS	WEAK PARTS
<ul style="list-style-type: none"> • Soil and climatic conditions favourable to organic agricultural production • Rich experience in agriculture with great potential to develop organic production skills • Transport, storage and processing infrastructure available for use in the organic circuit • Proximity to several markets in Europe with significant potential for procurement of organic agri-food products • Local demand not covered by ecological agri-food products of domestic origin 	<ul style="list-style-type: none"> • The low level of ecological culture of the population • The insufficiency of informative, educational and ecological culture promotion programs starting with primary education and ending with higher educational levels • Lack of official statistical information regarding production, logistics, internal and external trade of organic agri-food production
RISKS	OPPORTUNITIES
<ul style="list-style-type: none"> • The massive depopulation of the Republic of Moldova, which leads on the one hand to the chronic shortage of labour in agriculture, including the organic one, and on the other hand reduces the mass of potential customers who consume organic agri-food products • The intense erosion of agricultural lands resulting in the permanent elimination of considerable agricultural areas from the agricultural circuit and implicitly from the organic one • Other risks related to the supply on time and at economically advantageous prices with various agricultural inputs specific to organic production 	<p>Penetration of domestic agri-food production on EU markets following the process of legislative, normative and political rapprochement with the EU</p> <ul style="list-style-type: none"> • Identification, development, implementation and continuous improvement of informative, educational and ecological culture promotion programs starting with primary education and ending with higher educational levels • Monitoring and reporting to the National Bureau of Statistics data related to production, logistics, internal and external trade of organic agri-food production with the annual and quarterly publication of official data with reference to organic agri-food production

Source: developed by the authors

CONCLUSIONS

1. The Republic of Moldova has an untapped potential in terms of ecological agricultural production.

2. Analysis of the organic production sector is extremely important to accumulate the relevant information needed to estimate production volumes and trends in this prospective market.

3. The lack and/or insufficiency of official data regarding the production, logistics, export, import and consumption of organic products makes it difficult to analyse this sector and develop truthful forecasts of development, as well as sector policies.

4. The lack of conformity between national and EU legislation makes the certification procedure of organic producers confusing and duplicitous and creates problems in the development of this sector.

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