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EVALUATING THE POTENTIAL OF ORGANIC LAND USE IN UKRAINE

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Abstract

The paper analyzed the state and development trends of organic land use in Ukraine and determined its place in the European sector of organic agriculture. To assess the endogenous and exogenous factors of the development of organic land use in Ukraine, the method of SWOT analysis was used. It has been determined that the effective development of a model of organic farming is impossible without a comprehensive understanding of the situation about the potential of agricultural land use for the possibility of producing organic products. Methodological approaches to evaluation the potential of organic land use is proposed, based on the use of an integral index, which is characterized by a set of indicators for four main components: land-resource potential, agro-production potential, environmental safety and market infrastructure. In order to compare different-quality and different-dimensional indicators, it is proposed to interpret their values by normalizing, that is, to make the transition from absolute values to normalized ones. On the basis of the developed methodological approach, an evaluating of the potential for the development of organic land use in the regions of Ukraine was carried out. Such an evaluating makes it possible to differentiate regions (territories) depending on the integral index and to rank them as far as possible and potential for the development of organic land use. In turn, ranking territories according to the potential of organic land use helps to identify the most promising of them for investment in the development of organic production.

Key words**:** *evaluating, potential, organic, land use, agricultural, territory*

INTRODUCTION

One of the trends in the development of the world sector of the agricultural economy is the rapid development of organic agriculture. The latest data of Research Institute of Organic Agriculture FiBL shows that organic farmland grew in many countries, and the total organic area increased "to more than 72 million hectares, representing 1.5 percent of agricultural land worldwide, managed by more than three million producers" [22]. In particular, in Europe in 2019, the area of organic agricultural land in 1 year increased by 5.9% (0.9 million hectares) to 16.5 million hectares. At the same time, in the context of countries, the largest growth was shown by France, Ukraine and Spain (Fig. 1).

The main impetus for the spread of organic agriculture in Ukraine, on the one hand, was the global trend towards an increase in demand for organic products, and on the other hand, the awareness of the need to preserve the natural environment, greening economic activities and popularizing a healthy lifestyle [1; 17; 19].

Noting the objective nature of the organization of the organic agricultural production system, it should be said that the formation of an agricultural economy focused

on the production of organic products should be realized and acceptable to the majority of citizens, especially landowners and land users. Considering the significant land-resource potential of Ukraine, where in the near future there will be a full-fledged land market with the possibility of buying and selling agricultural land, and due to the high global demand for organic products, national and foreign investors are increasingly showing interest in the development of organic land use in Ukraine.

However, it should be noted that the Ukrainian model of organic land use is significantly different from the world, including the European one. If in European countries the cost of production increases significantly after the transition to organic farming, then in Ukraine the increase in this indicator is moderate, due to the high natural soil fertility. This is confirmed by the practical experience of domestic agricultural enterprises that have switched to organic farming technology [3; 4; 5; 8; 13; 21].

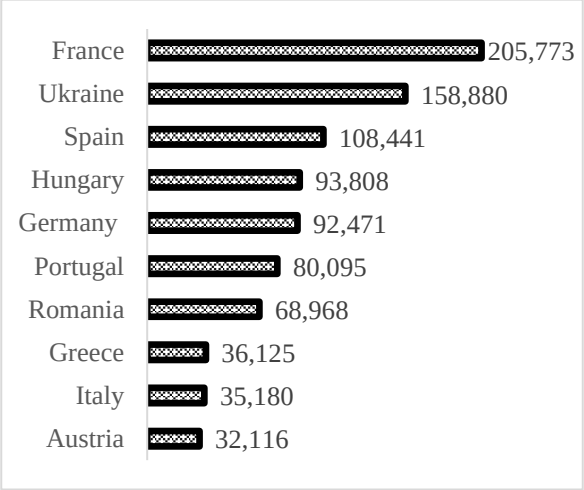

Fig. 1. The ten European countries with the highest increase of organic land, hectares
Source: FiBL survey 2021 [22].

It is traditionally believed that the potential for the development of organic production on agricultural land depends on three main components: economic (development of the material and technical base, availability of natural resources), environmental (compliance of existing resources, ecosystems and production technologies with environmental requirements) and social (the population's ability to pay and their perception of the concept of green production and environmental friendliness of products) [9-11].

V. Kyporenko and A. Vdovychenko notes that the development of organic production in Ukraine is slowed down by certain factors, namely: “economic risks (associated with a decrease in profitability during the transition period); ecological (the presence of a significant amount of contaminated and depleted land that cannot be used for the needs of organic production); legal (insufficient level of regulation of the sphere of production, certification and sale of organic products), informational (low level of information support to consumers about the benefits of organic products and distrust of its producers ”[7].

Scialabba N., Hattam C. believe that “the determination of the suitability of organic agriculture should include agroecological, economic, social and institutional considerations” [14].

Given the controversy and insufficient validity of approaches to the evaluation potential and prospects for the development of organic agroland use, the development of principles and methods for such an assessment requires further scientific substantiation. The relevance of the above is confirmed by the presence of a specific institutional environment in the Ukrainian organic sector of the economy.

MATERIALS AND METHODS

The formation of organic farming is completely determined by the current influence on this sector of endogenous factors (natural and climatic conditions, resources, market conditions, and so on) and exogenous factors (institutional environment, social and political characteristics, the general state of the state's economic system) [2; 10]. To assess the endogenous and exogenous factors of the development of organic land use in Ukraine, the method of SWOT analysis was used (Fig. 2). In order for the SWOT analysis to give an objective picture, we conducted an expert survey of organic market operators.

To study the potential for the development of organic land use in Ukraine, it is necessary to analyze its constituent parts. This will reveal the potential role of the organic sector in the market of each region of Ukraine, which will contribute to its most efficient functioning.

How a particular region is suitable for the production or consumption of organic products depends on a number of characteristics.

STRENGTHS	**WEAKNESS**
– the growing role of organic agriculture and a positive trend in demand for organic products abroad; – low chemicalization of agriculture; – the presence of a significant amount of potentially suitable land; – favorable climatic and natural conditions; – ensuring high quality and safety of products; – the presence of an unemployed rural population interested in the development of the industry; – existing experience in organic farming by domestic farms	– underdeveloped institutional environment; – lack of national certification and labeling bodies; – high prime cost and product price with a low shelf life; – poor development of animal husbandry; – low level of provision of promotion and retail of organic products and promotion of healthy food; – undeveloped domestic market for organic products; – low paying capacity of the population; – low availability of borrowed financial resources
OPPORTUNITY	**THREAT**
– low competition on the domestic – organic market; – dissemination of experience of foreign producers of organic products; – growing environmental awareness of the population; – preservation of traditions and national culture; – preservation of the natural environment; – combination of organic agriculture with related areas of natural resources, including recreation and tourism; – development of auxiliary areas; – access to foreign markets.	– inconsistent and inadequate development of the regulatory framework for organic producers; – inadequate government support for organic agriculture (information, financial, marketing); – insufficient provision of scientific research on development issues and environmental and economic justification; – instability of the economic and political situation in the country; – a decrease in the level of purchasing power of the population; – underdevelopment of the agricultural land market.

Fig. 2. SWOT analysis of the organic land use sector in Ukraine
Source: author's elaboration.

We propose to determine the potential of organic land use by the combination of four main components: land-resource potential, agroproduction potential, environmental safety and market infrastructure. Each of these components can be calculated by calculating indicators within certain criterion groups (Table 1).

The weight of each indicator and components (criterion) was determined by expert judgment. For this, a written survey of specialists and scientists in the field of land use was carried out in order to systematize objective data on the level of influence of certain indicators on the development of organic agricultural land use [6; 15].

In order to eliminate the difference in the dimensions of the given indicators, rationing was carried out.

The rationing procedure involves the transformation of the values of all indicators in comparison with the optimal value (the best among the analyzed ones), while the normalized indicator is in the range from 0 to

1, and the maximum proximity to one indicates the level of optimality of the actual indicator [16; 18].

Table 1. List of components and indicators for assessing the potential of organic land use

Components and indicators	The threshold values
Land-resource potential	**35**
Total area of agricultural land	8
Agricultural assimilation of the territory	6
Ecological and agrochemical assessment of lands	7
Humus content in the soil	7
Agroclimatic potential	7
Agro-production potential	**21**
Gross agricultural output	8
Resource provision of agricultural producers	7
The level of economic activity of the rural population	6
Environmental safety	**32**
Pesticide load	8
Chemical load	8
The level of land erosion	6
Intensity of land erosion	3
The area of agricultural lands contaminated with radionuclides	7
Market infrastructure	**12**
Capacity of the intraregional market for organic products	8
Level of logistic service	4

Source: author's elaboration.

To calculate the integral indicator (index) for assessing the potential of organic land use (I_{pol}), the sum of the normalized values of the set of indicators included in them is determined, adjusted in accordance with their weight:

$$I_{pol} = \sum_{i=1}^{n} x_i \times gx_i \times 100, \quad (1)$$

x_i – normalized value of the *i*-th indicator;
gx_i – weighting coefficient of the *i*-th indicator;
n – the number of indicators used in calculating the integral index.

The proposed methodological approach to the evaluation of the potential of organic land use permit to objectively evaluate the potential use of agricultural land for organic farming at the regional or country level. By adapting the set of indicators proposed within the framework of certain criteria to the activities of economic entities, it is also possible to determine the potential of organic land use for specific agricultural producers.

RESULTS AND DISCUSSIONS

Ukraine has huge potential in the organic sector, the analysis of which allows us to conclude that the country in the near future can significantly expand its influence on the organic food market. Firstly, one of these opportunities is that Ukraine has a huge resource of agricultural land (42.7 million hectares) [20].

In addition, Ukraine occupies one of the leading places in Europe in terms of agricultural land area [12; 20]. As of 2019, Ukraine ranks 12th among European countries in terms of the area of agricultural land used for organic farming (Table 2).

Table 2. Organic agricultural land by European countries, 2019 (TOP-25)

№	Country	Hectares
1	Spain	2,354,916
2	France	2,240,797
3	Italy	1,993,225
4	Germany	1,613,785
5	Russian Federation	674,370
6	Austria	669,921
7	Sweden	613,964
8	Czech Republic	540,986
9	Greece	528,752
10	Turkey	518,435
11	Poland	507,637
12	**Ukraine**	**467,980**
13	United Kingdom	459,275
14	Romania	395,228
15	Finland	306,484
16	Hungary	303,190
17	Portugal	293,213
18	Latvia	289,796
19	Lithuania	242,118
20	Estonia	220,737
21	Slovakia	197,565
22	Switzerland	172,713
23	Bulgaria	117,779
24	Croatia	108,127
25	Belgium	93,119

Source: formed by the author according to FiBL survey 2021 [22].

However, if we take into account the share of organic land use in the total area of agricultural land, the situation changes dramatically (Table 3).

Table 3. Organic shares of total agricultural land by European countries, 2019 (TOP-35)

№	Country	Organic share, %
1	Liechtenstein	41.0
2	Austria	26.1
3	Estonia	22.3
4	Sweden	20.4
5	Switzerland	16.5
6	Czech Republic	15.4
7	Italy	15.2
8	Latvia	14.8
9	Finland	13.5
10	Denmark	10.9
11	Slovenia	10.3
12	Slovakia	10.3
13	Germany	9.7
14	Spain	9.7
15	Greece	8.7
16	Portugal	8.2
17	Lithuania	8.1
18	France	7.7
19	Croatia	7.2
20	Belgium	6.9
21	Hungary	5.7
22	Cyprus	5.0
23	Norway	4.6
24	Luxembourg	4.4
25	Netherlands	3.7
26	Poland	3.5
27	Romania	2.9
28	United Kingdom	2.6
29	Bulgaria	2.3
30	Ireland	1.6
31	Turkey	1.4
32	Moldova	1.2
33	**Ukraine**	**1.1**
34	Serbia	0.6
35	Malta	0.5

Source: formed by the author according to FiBL survey 2021 [22].

Ukraine, with an indicator of the share of organic land use of 1.1% in this area, already occupies the 33rd position. This indicates a huge potential for the development of the organic sector in Ukraine.

In general, Ukraine ranks first in the Eastern European region in terms of certified organic arable land, specializing mainly in the production of cereals, legumes and oilseeds. The number of domestic organic farms is growing every year, of which today there are about 617. In addition to the growth in the area and the number of farms engaged in the production of organic products, over the past three years, the domestic market has been consistently filled with its own organic products due to the establishment of domestic processing of organic raw materials. The domestic market for organic products in Ukraine was estimated in 2019 at close to 20 million euros.

As for the indicators of export of organic products from Ukraine, in 2019 it was estimated at about 160 million euros. At the same time, 85% of exported products were supplied to the countries of Europe.

Table 4. Organic agricultural land and organic shares of total agricultural land by Ukrainian region

№	Region	Hectares	Organic share, %
1	Herson	84,540	4.16
2	Kyiv	60,423	3.37
3	Odesa	49,608	1.87
4	Cherkasy	41,428	2.79
5	Zaporizhia	40,433	1.76
6	Zhytomyr	37,623	2.38
7	Poltava	25,755	1.16
8	Rivne	20,403	2.13
9	Dnipropetrovsk	19,111	0.74
10	Lviv	15,104	1.17
11	Kirovohrad	14,478	0.70
12	Khmelnytskyi	12,928	0.81
13	Chernihiv	11,650	0.55
14	Ternopil	10,278	0.96
15	Mykolayiv	9,430	0.46
16	Kharkiv	4,578	0.19
17	Volyn	4,564	0.42
18	Vinnytsia	3,559	0.17
19	Transcarpathian	1,166	0.25
20	Ivano-Frankivsk	576	0.09
21	Chernivtsi	191	0.04
22	Sumy	85	0.005
23	Donetsk *	69	0.003
24	Luhansk *	0	0.00
Ukraine		**467,980**	1,10

* Data without taking into account a part of the territory of the region.
Source: author's elaboration.

In 2019, Ukraine ranked 2nd out of 123 countries in terms of the volume of imported organic products in the EU, up two steps from the previous year.

Analysis of the current state of organic land use in Ukraine in the regional context shows a significant differentiation of the country's regions depending on the total area of organic agricultural land and the share of organic land in the total structure of agricultural land (Table 4).

In particular, Kherson is the region with the largest area of organic agricultural land (84,540 hectares) and the share of these lands among the total area of agricultural land use (4.16). In such regions as Ivano-Frankivsk, Chernivtsi, Sumy, Donetsk and Lugansk, organic agriculture is practically absent.

However, the key indicators of land use in the context of regions have been investigated, within the framework of studying possible trends in their development, systematization and comparison, do not allow reflecting a holistic view of the possible potential of organic land use, which is necessary for the development and adoption of an integrated decision. In this aspect, a detailed component-wise study should be carried out, followed by generalization and systematization of the output data according to the corresponding integral index, which determines the key indicators of the potential of organic land use, taking into account their optimal values.

Using the proposed method of assessment based on the results of calculations, the indicators of the potential of organic land use in the regions of Ukraine are characterized with due completeness. The value of the integral index and its main components are reflected in Table 5.

Table 5. The results of calculating the integral index of the potential of organic land use in the regions of Ukraine

№	Region	The value of the indicators of the main components of potential of organic land use				Integral index of potential of organic land use
		Land-resource potential	Agro-production potential	Environmental safety	Market infra-structure	
1	Kyiv	87.8	94.3	81.8	97.1	88.4
2	Odesa	86.0	83.3	81.1	96.9	85.2
3	Cherkasy	81.3	88.7	85.8	80.6	84.2
4	Dnipropetrovsk	88.0	90.3	75.7	83.6	84.0
5	Herson	79.4	84.6	85.1	90.8	83.7
6	Kirovohrad	88.6	81.3	73.7	83.6	81.7
7	Kharkiv	86.4	87.1	68.3	91.4	81.4
8	Mykolayiv	81.3	74.5	80.7	92.8	81.1
9	Chernihiv	78.3	81.6	85.4	76.5	81.0
10	Zaporizhia	82.0	78.3	78.0	77.5	79.4
11	Ivano-Frankivsk	73.8	63.5	89.6	90.8	78.7
12	Poltava	80.2	90.1	65.4	88.7	78.6
13	Vinnytsia	75.3	93.8	61.6	81.2	75.5
14	Sumy	81.0	65.8	69.7	78.5	73.9
15	Ternopil	80.6	67.8	66.3	79.6	73.2
16	Donetsk *	82.7	76.8	56.4	77.5	72.4
17	Khmelnytskyi	76.1	81.3	60.0	77.5	72.2
18	Lviv	74.6	70.6	66.2	79.6	71.7
19	Luhansk *	72.3	70.3	67.7	77.5	71.0
20	Transcarpathian	62.5	53.5	80.4	87.7	69.4
21	Chernivtsi	75.6	70.3	57.9	78.5	69.2
22	Rivne	69.3	69.2	65.5	77.5	69.0
23	Volyn	57.5	70.3	72.2	76.5	67.2
24	Zhytomyr	61.6	62.5	60.4	80.6	63.7

* Data without taking into account a part of the territory of the region.
Source: author's elaboration.

Analysis of the Table 5 showed that among the regions of Ukraine the Kyiv region is characterized by the greatest potential for organic land use (final estimate 86.3). The potential indicator in Odesa (85.2), Cherkasy (84.2), Dnipropetrovsk (84.0) and

Herson (83.7) regions is somewhat lower. At the same time, several regions of Ukraine have a low level of potential for the development of organic production in their territories, namely: Zhytomyr and Volyn.

It should also be noted that certain regions have rather high values of indicators simultaneously for several components, but due to the indicators of market infrastructure (for example, Chernihiv), in general, they have a lower potential for the development of organic land use than the leaders.

The results of the analysis of Table 5 in individual regions reflect a significant difference in the values of the main components of the potential for the development of organic land use, which indicates the imbalance of these four components and the need to take into account the peculiarities in the development of the organic sector of the regional economy.

CONCLUSIONS

Thus, when assessing the potential for the development of organic land use, it makes sense to use indices that characterize its value from production and consumer positions, and make it possible to identify territories depending on their potential role in this segment of the economy.

In general, the proposed methodological approaches to evaluation the potential of organic land use, based on the use of an integral index, include a set of assessment criteria and indicators, an algorithm for their normalization in accordance with optimal values.

They make it possible to differentiate regions (territories) depending on the integral index and to rank them as far as possible and potential for the development of organic land use. In turn, the ranking of territories (regions) by the potential of organic land use helps to identify the most promising of them for investment in the development of organic production and ensuring the effective functioning of producers of organic agricultural products.

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