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Agricultural land turnover in Ukraine: New challenges and new opportunities

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► **Abstract.** The experience of the market turnover of agricultural land in Ukraine has shown that untimely and insufficiently comprehensive analysis of the functioning of the land market can lead to incorrect conclusions and limit the understanding of its dynamics and impact on the country's economic situation. The purpose of the study was to identify the main trends and indicators of the market turnover of agricultural land in Ukraine by analysing land ownership transactions. The methodological tools of the problem under study were general scientific and special methods, as well as the method of comparison and abstract and logical methods. The main results of the study are a cost and quantitative assessment of transactions of sale and purchase of ownership rights to agricultural land in Ukraine, which makes it possible to identify the main trends in the land market. Certain provisions can be used to formulate strategies for the development of land relations in Ukraine. The number and share of transactions involving the sale and purchase of ownership rights to agricultural land in the overall structure of transactions is determined. The area of land ownership rights to which were alienated through sale and purchase is determined. The author calculates the value of agricultural land depending on its remoteness from a settlement, regional location and designated purpose. Fluctuations in the value of arable land depending on their territorial location and in the overall dynamics by month are determined. The level of activity of agricultural land market participants in the country as a whole and by regions is determined. The results and trends in the market turnover of agricultural land in the territories where military operations were or are ongoing are investigated. The main key indicators of the market turnover of agricultural land are determined. Forecasts of the value of arable land in Ukraine by the end of 2023 are formed. The discrepancy between the Ukrainian model of agricultural land market turnover and the models operating in the European Union has been established. The results of the study can be used to develop ways to reorient the market turnover of agricultural land to the European principles of functioning aimed at the development of family farming as a fundamental goal of Ukraine's agricultural policy

► **Keywords:** market turnover; agricultural land; transactions; market; value; property

► Introduction

A key element of the efficient functioning of the agricultural sector in any country is the effective distribution and use of agricultural land. As of 2023, there is no country on the world map with a developed and efficient agriculture where the market turnover of agricultural land would not be regulated by the state. Countries regulate the market turnover of land based on their national interests by

applying a number of individual regulatory mechanisms and instruments combined into one general concept.

The agricultural land market has been fully operational in Ukraine for two years. However, the results of the land market functioning are not properly analysed: the analysis of indicators is carried out without taking into account value fluctuations, which affects the objectivity of

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the final conclusions; the structure of transactions on the transfer of ownership of land plots remains undisclosed; trends in value and quantity indicators depending on the location of land and its intended use remain unexplored. Transactions for the sale and purchase of property rights in the context of certain types of land have not been studied. The impact of the martial law on the land market is also not sufficiently studied, and the main goal of launching an agricultural land market has not been achieved. All this makes it impossible to form a correct and comprehensive vision of the results and provokes incorrect conclusions and forecasts regarding the functioning of the agricultural land market in Ukraine. The market turnover of agricultural land is in the scientific field of view of leading Ukrainian researchers.

The results of the work of O. Khodakivska & O. Mohylnyi (2019) are relevant, which refute the inflated expectations from the introduction of unregulated market turnover of agricultural land in Ukraine. The “village-preserving model” of the market turnover of agricultural land was outlined and studied by Y. Hadzalo & V. Zhuk (2015). The researchers identified and singled out a scenario of building market relations in the land market, according to which the main goal of the market is to preserve and develop the countryside. The study of the prerequisites for the introduction of the agricultural land market in Ukraine is devoted to the work of O. Shulha (2021), where the scientist substantiates the need for institutions, macroeconomic conditions and the stages of market introduction.

The main disadvantages of the market turnover of agricultural land, which impede the attraction of investments in agriculture in Ukraine, are highlighted in the scientific works of V. Andreeva (2020). N. Stupen *et al.* (2019) studied the conditions for the introduction of market turnover of agricultural land in Ukraine, highlighting the fundamental aspects: state control and institutional support. Given the significant achievements of Ukrainian and foreign scholars on the market turnover of agricultural land, such aspects of land turnover in Ukraine as the dynamics of value and quantitative indicators in the market, as well as the impact of the war in Ukraine on the trends in alienation of ownership of agricultural land through their sale and purchase, need to be covered more widely, which justifies the relevance of the results presented.

The purpose of the study was to determine the results of the functioning of the market turnover of agricultural land in Ukraine. The task of the study is to comprehensively study the transactions of sale and purchase of ownership rights to agricultural land plots concluded in Ukraine between 01.07.2021 and 31.12.2022 to identify the main trends and evaluate the results.

► Materials and Methods

The work was carried out by applying general scientific, economic and statistical research methods. In particular, the analytical and statistical methods were used to determine the number of land sale and purchase transactions, their area, and structure by region, the dynamics of land sale and purchase transactions by month, the number of agricultural land sale and purchase transactions by location, the dynamics of agricultural land and arable land value, in particular by region and location.

The comparative method was used to compare the value of land and its regulatory monetary valuation; compare the value of sale and purchase transactions by location; compare the value of sale and purchase transactions by region of land location, compare the value of land in accordance with its intended use; compare the value of land depending on its location and region. The grouping method was used to separate the data from the total array, depending on the type of land. The analytical and statistical methods of arithmetic mean and median were used to calculate the obtained value and quantitative indicators. The arithmetic mean was calculated using the classical formula:

$$\bar{x} = \frac{x_1 + x_2 + \dots + x_n}{n} = \frac{\sum x}{n}, \quad (1)$$

where $x_1 \dots x_n$ – is the volume of the feature; n – is the size of the population.

The median of the studied indicators was calculated using the following formula:

$$M_e = x_{M_e} + i_{M_e} \frac{\frac{\sum f}{2} - S_{M_e-1}}{f_{M_e}}, \quad (2)$$

where x_{M_e} – is the lower boundary of the median interval; i_{M_e} – is the width of the median interval; $\frac{\sum f}{2}$ – is the number of all values divided by 2; S_{M_e-1} – is the accumulated frequency of the pre-median interval; f_{M_e} – is the number of observations in the median interval.

In order to determine the forecast of arable land value, we used the regression analysis method according to the following formula:

$$\hat{y} = a + bx, \quad (3)$$

where \hat{y} – is the expected value of y for a given value of x ; x – is the independent variable; a – is the segment on the y -axis for a straight line; b – is the slope of the straight line.

By using the abstract and logical method to analyse and study the problems of the agricultural land market, the main structural shortcomings of this market were revealed and ways to overcome them were identified. This method, using logical concepts and abstract models, helped to identify the main systemic problems. The graphical method was used as a tool for visualizing complex data and research results. In particular, it helped to show the geographical distribution of alienated agricultural land, noting differences in the volume and nature of such transactions between different regions. The graphs also showed variations in land values depending on their location, making it possible to identify areas with high and low market prices for land. Additionally, the graphical representations were used to analyse the dynamics of changes in arable land values and their relationship to changes in market conditions.

The main information base for the calculations was the open data of land relations monitoring (starting from 01.07.2021) of the State Service of Ukraine for Geodesy, Cartography, and Cadastre (Monitoring of land relations, 2023). The combination of abstract and logical and graphical methods allowed for a deeper understanding of the problems of the agricultural land market, clarifying their relationship and visualizing complex data, which contributes to the development of more effective strategies for managing this market.

► Results

Since 1 July 2021, in accordance with the Law of Ukraine No. 552-IX “On Making Changes to Certain Legislative Acts of Ukraine Regarding the Terms of Circulation of Agricultural Land” (2020), agricultural land has been brought into the market. Despite the full functioning of the land market

and the right to dispose of land shares, their owners are in no hurry to alienate their land plots. The share of agricultural land sales and purchases in 2021-2022 was 26% of the total number of land transactions. The vast majority of transactions involving the transfer of ownership of agricultural land were related to inheritance (68%) (Table 1).

Table 1. Structure of agreements regarding the transfer of ownership rights to land plots in rural areas and urban areas appointment in Ukraine for 2021-2022

Type of agreement	Number of transactions, units	Share, %
A certificate of inheritance	308 761	68.4
Contract of sale	117 031	25.9
Deed of Gift	24 787	5.5
Mine contract	866	0.19
Lifetime maintenance contract	80	0.02
Total number of transactions	451 525.0	100.00

Source: monitoring of land relations (2023)

During 2021-2022, 266.6 thousand hectares of agricultural land were alienated in Ukraine through sales and purchases, which is 0.6% of all agricultural land. The ownership rights to the land shares were sold through 117 thousand purchase and sale transactions. The largest

area of agricultural land, the ownership rights to which were sold through sale and purchase, was recorded in the Kharkiv region – 34.2 thousand hectares. This region is also the leader in terms of the number of sale and purchase transactions – 9.9 thousand transactions (Table 2).

Table 2. Expropriated area and number of land purchase and sale agreements in rural areas appointment by region for 2021-2022*

Region	Alienated area		Number of transactions purchase/sale
	Ha	share of the total area of all agricultural land in the region, %	
Kharkivska	34 203	1.4	9 861
Dnipropetrovsk	22 862	0.9	5 826
Poltava	22 328	1.0	8 927
Kirovohradsk	19 919	1.0	6 238
Kherson	17 699	0.9	4 201
Vinnytsia	17 127	0.9	9 395
Khmelnyskyi	15 686	1.0	8 515
Sumy	14 517	0.9	8 469
Mykolayivska	12 681	0.6	3 494
Kyivska	11 439	0.7	8 033
Chernihivska	10 946	0.5	5 501
Zaporizhzhia	9 740	0.4	2 673
Zhytomyr	8 095	0.5	4 749
Odesa	7 843	0.3	2 854
Cherkasy	6 910	0.5	4 121
Volynsk	6 587	0.6	4 767
Donetsk	6 155	0.3	1 616
Luhansk	5 851	0.3	1 229

Table 2, Continued

Region	Alienated area		Number of transactions purchase/sale
	Ha	share of the total area of all agricultural land in the region, %	
Ternopil	4 827	0.5	3 350
Lviv	3 226	0.3	3 486
Rivne	2 232	0.2	2 383
Chernivtsi	2 067	0.4	2 393
Zakarpattia	1 997	0.4	2 088
Ivano-Frankivsk	1 274	0.2	2 682
Across Ukraine	266 556	0.6	117 031

Note: * – structured by area from the largest to the smallest indicator
Source: monitoring of land relations (2023)

In turn, the smallest area was sold in the Ivano-Frankivsk region – 1.3 thou hectares. However, the lowest number of sale and purchase transactions was recorded in Luhansk region – 1.2 thousand hectares and Donetsk region – 1.6 thousand hectares. It is worth noting the trend observed in the western regions of Ukraine, namely, the total number of sale and purchase transactions exceeds

the area of land sold and purchased, which indicates the sale of small (up to 1 hectare) land shares. Analysing the market turnover of agricultural land, it can be noted that the largest areas of land, the rights to which were sold, are observed in the north-eastern and central regions of Ukraine, while in the southern and western regions this figure is much lower (Fig. 1).

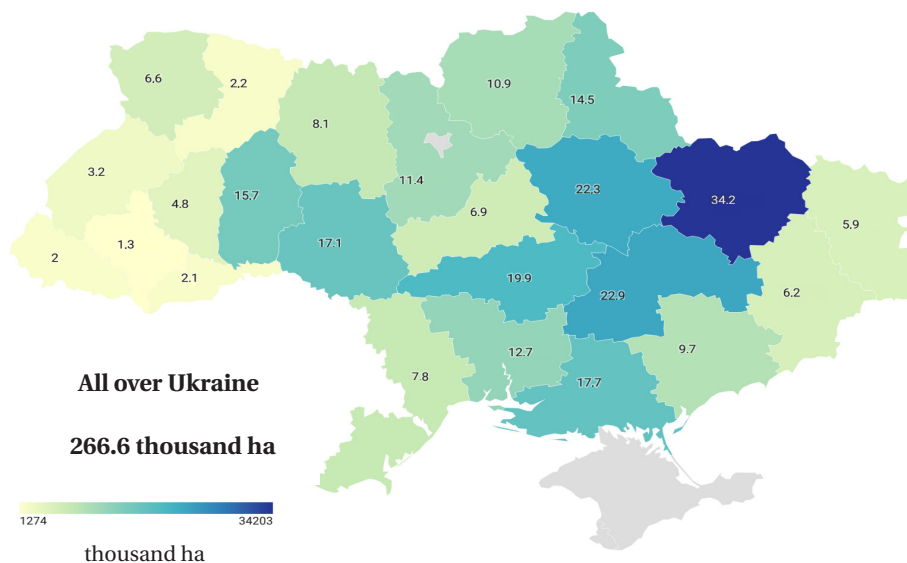


Figure 1. Alienated area of agricultural land under sale and purchase agreements by regions in 2021-2022
Source: monitoring of land relations (2023)

The location of land is a factor that determines not only its current use but also its future. A land plot located near a city will potentially have a higher value than a similar land plot located in rural areas or outside a settlement. Studies of the value of agricultural land, depending on the location of the land plot, largely confirm this statement. The value of agricultural land in Ukraine, depending on the location of the land plot, is as follows: 64 thousand UAH/ha – within the city; 45.2 thousand UAH/ha – within the village; 29.2 thousand UAH/ha – outside the settlement.

It should be noted that this trend does not always hold true at the regional level. For example, in Volyn region, the

value of land within the city limits is UAH 17.1 thousand per hectare, outside the city 22.8 thousand per hectare, and within the village 39.1 thousand per hectare (Fig. 2). Among the regions where the cost of land within villages is higher than the cost of land within cities are: Vinnytsia, Volyn, Zhytomyr, Lviv, Mykolaiv, and Odesa regions. There were also regions where the value of land outside settlements exceeds the value of land within villages: Kirovohrad, Luhansk, Kharkiv, and Kherson. The highest value of agricultural land within the city limits is in the Kyiv region – 103.5 thousand UAH/ha, while the lowest value is in the Mykolaiv region – 15.3 thousand UAH/ha.

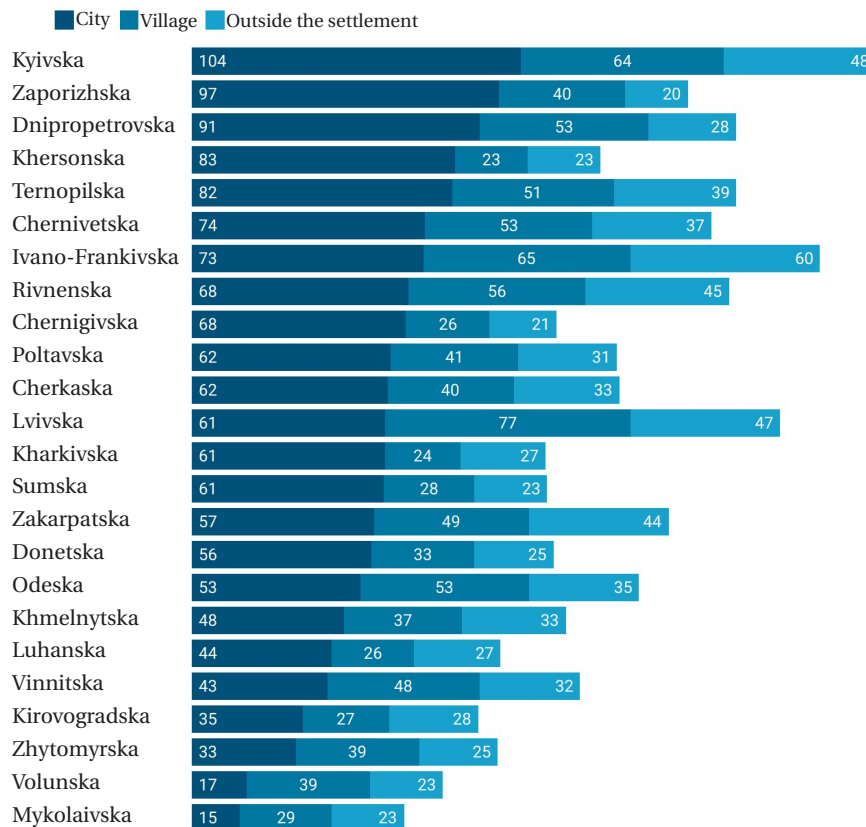


Figure 2. The cost of agricultural land, depending on the location, by region in 2021-2022, thousand UAH/ha
Source: monitoring of land relations (2023)

The value of agricultural land located within villages is highest in the Lviv region – 76.9 thousand UAH/ha, while the lowest value is 22.7 thousand UAH/ha in the Kherson region. For the purpose of a deeper study of the value of agricultural land, the value of land in Ukraine was determined depending on its intended use: 26.4 thousand UAH/ha – agricultural land; 27.9 thousand UAH/ha – farm; 33.6 thousand UAH/ha – commercial agricultural production; 85.8 thousand UAH/ha –

subsidiary farming; 273.6 thousand UAH/ha – individual gardening; 671.2 thousand UAH/ha – collective gardening.

Monitoring of the value of agricultural land, depending on its intended purpose, by region showed that the highest value of land used for commercial agricultural production is in the Ivano-Frankivsk region – 43.4 thousand UAH/ha, and the lowest value is in the Kherson region – 24.4 thousand UAH/ha (Table 3).

Table 3. The cost of rural land assignment, depending on the target assignment by region for 2021-2022

Region	The cost of rural land destination, thousand hryvnias/ha					
	Commercial agricultural production	Farming households	Individual agricultural household	Subs. village household	Ind. gardens	Number of gardens
Vinnitsia	32.2	39.1	22	101.9	453.6	751.2
Volynsk	33.7	27.9	20.7	14.1	301.9	500
Dnipropetrovsk	30.2	28.1	23	731	13.3	241.7
Donetsk	29.9	15.4	17.3	550.2	12.1	219
Zhytomyr	28.2	30.8	17.2	29	135	223.6
Zakarpattia	34.1	12.1	48	150.5	87.7	145.2
Zaporizhzhia	25.7	20.7	13.5	429.2	526.4	789.5
Ivano-Frankivsk	43.4	15.3	89.6	280.8	1 090.8	1 230.2
Kyivska	39.3	42.8	114.8	108	613.9	1 016.7
Kirovohrad	32.7	29.1	27.2	3 149.2	29.3	69.1
Luhansk	29.8	30.5	19.8	627.9	13.8	249.9
Lviv	31.5	25.9	142.7	447.1	620.1	699.3

Table 3, Continued

Region	The cost of rural land destination, thousand hryvnias/ha					
	Commercial agricultural production	Farming households	Individual agricultural household	Subs. village household	Ind. gardens	Number of gardens
Mykolayiv	29	23.7	13.7	19.8	175.5	414.5
Odesa	33.1	25.4	35.3	51	787.4	1 859.4
Poltava	36.1	34.8	25.3	65.8	175.5	352.6
Rivne	26.7	93.5	27	352.1	100	165.6
Sumy	25	23.7	15.6	117.4	114.1	229.1
Ternopil	32.9	33.4	53.2	160.8	880.2	992.6
Kharkiv	33.3	34.4	10	3 631.9	111.2	223.3
Kherson	24.4	18.5	16.6	113.3	170.7	256
Khmelnyskiy	33.8	34.3	29.2	88.2	136.2	257
Cherkasy	37	32.8	37.4	29.9	48.5	114.5
Chernivtsi	33.5	29.5	58.2	161.3	132.8	149.8
Chernihiv	24.6	20.9	14	105.6	250	502.1
Across Ukraine	33.6	27.9	26.4	85.8	273.6	671.2

Source: monitoring of land relations (2023)

Agricultural land used for farming has the highest value of 93.5 thousand UAH/ha in the Rivne region, while in Zakarpattia region it is worth 12.1 thousand UAH/ha, which is the lowest in Ukraine. The most expensive agricultural land, depending on its intended use, is the land used for arable farming in Kharkiv region – UAH 3.6 million/ha. In turn, the land used for private farming has the lowest value – 10 thousand UAH/ha in Kharkiv region.

The value of agricultural land in Ukraine for the period under review is UAH 30.3 thousand per hectare, which

exceeds the normative monetary value (hereinafter – NMV) by 18%. The study of the dynamics of agricultural land value in 2021-2022 by months shows fluctuations in value. In almost 18 months of market operation, the value of agricultural land has increased by UAH 14 thousand, from a minimum of UAH 26 thousand per hectare to UAH 40 thousand per hectare. However, it should be noted that this growth is not linear, and the maximum value was recorded only in November 2022, while in December 2022 the value decreased by UAH 5 thousand (Fig. 3).

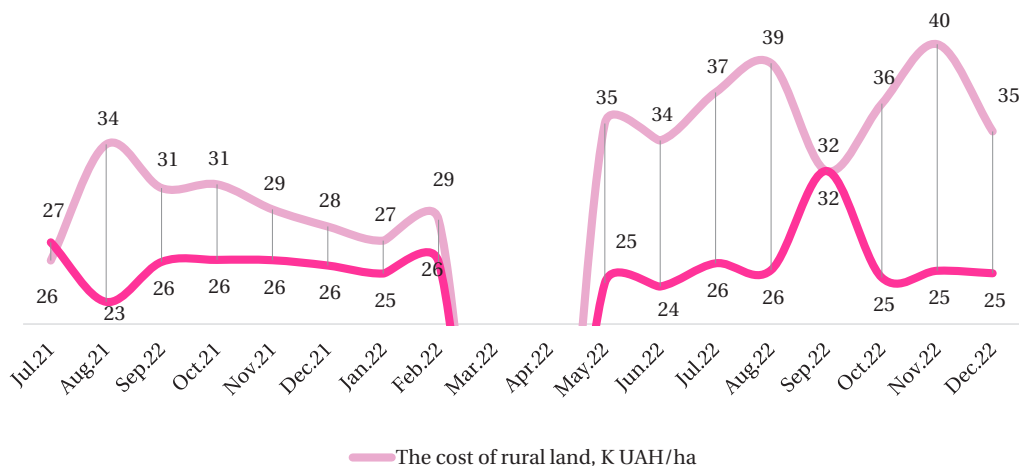


Figure 3. Dynamics of agricultural land value in Ukraine in 2021-2022, thousand UAH/ha

Source: monitoring of land relations (2023)

When studying the dynamics of agricultural land values, one should pay attention to the value indicator in comparison with the indicator of the NMV of land in the first month of the market's operation. In July 2021, it was recorded that in Ukraine, the NMV was UAH 27 thousand per hectare, while the land value was UAH 26 thousand per hectare, i.e. the NMV was UAH 1 thousand higher than the value of agricultural land, which contradicts the

legislation in terms of the provision of the Law of Ukraine No. 552-IX "On Amendments to Certain Legislative Acts of Ukraine on the Terms of Turnover of Agricultural Land" (2020), which stipulates that the sale price of agricultural land may not be less than their normative monetary value. In addition, it was recorded that in September 2022, the value of agricultural land and NMV had the same indicators of UAH 32 thousand per hectare, i.e., the value of land

decreased to the lowest possible level. The dynamics of agricultural land value over the study period shows that

a significant increase in land value occurred mainly in the western regions of Ukraine (Fig. 4).

	2021						2022									
	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Vinnitska	25	34	36	40	23	29	27	23	19	67	43	35	49	30	55	32
Volhynska	21	27	23	25	19	23	21	22	39	28	20	23	25	46	39	17
Dnipropetrovska	19	32	28	28	20	29	29	29	61	29	31	29	33	41	31	28
Donetska	19	14	34	25	20	26	29	27	0	0	0	20	0	2	2	24
Zhytomyrska	25	28	26	32	15	24	28	21	40	22	72	89	47	21	22	71
Zakarpatska	33	46	49	35	51	39	45	48	31	69	51	46	37	115	45	41
Zaporizhska	15	50	29	25	15	23	19	25	20	18	18	32	11	1	7	29
Ivano-Frankivska	45	76	57	57	44	72	66	76	62	107	92	53	48	94	79	114
Kyivska	48	51	52	52	41	69	56	64	132	97	72	60	106	38	74	67
Kirovogradska	21	29	28	27	23	30	31	30	49	34	33	15	27	33	35	36
Luhanska	23	27	29	29	29	25	27	30	0	0	0	0	0	0	0	0
Lvivska	39	49	44	42	17	60	98	77	100	54	92	115	67	84	113	98
Mykolaivska	14	22	20	22	21	31	28	17	32	33	31	24	19	30	27	27
Odeska	41	39	39	39	38	45	35	35	27	46	33	42	33	33	32	32
Poltavska	23	33	32	31	38	41	28	28	29	31	40	41	32	36	43	32
Odeska	34	65	56	53	15	85	27	30	100	26	52	18	23	56	21	20
Sumska	22	24	22	25	13	35	14	17	25	12	29	27	20	135	30	10
Ternopil'ska	28	37	35	41	44	65	43	36	81	41	37	73	31	45	31	47
Kharkivska	18	33	29	30	25	35	24	33	0	28	35	12	9	0	35	32
Khersonska	15	24	23	21	33	26	23	22	0	0	0	0	0	0	0	0
Khmelnitska	30	36	35	37	25	52	31	28	28	34	28	29	22	24	39	31
Cherkaska	27	37	36	38	15	84	26	36	40	38	39	36	40	41	39	38
Chernivetska	33	57	53	48	29	144	28	36	29	35	26	30	30	45	40	42
Chernigivska	13	26	21	21	10	48	16	22	4	12	15	10	32	28	8	14

Figure 4. The cost of agricultural land in the regions of Ukraine by months in 2021-2022

Source: monitoring of land relations (2023)

The market value of land in some regions of Ukraine has increased since May 2022, after the outbreak of war and two months of non-functioning of the land market. However, Kherson and Luhansk oblasts are the only ones where the land market has been suspended since May

2022 and no land sales have taken place. The value of arable land in Ukraine for the period under study is 32.2 thousand UAH/ha, which is 13% higher than the NMV. A study of arable land values by regions shows that the highest values are in the western regions of Ukraine (Fig. 5).

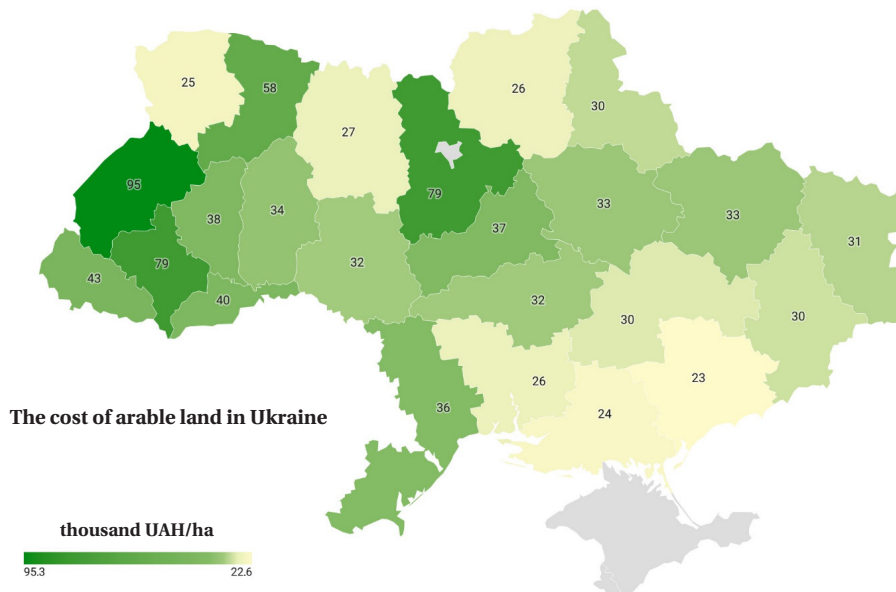


Figure 5. Cost of arable land by regions of Ukraine in 2021-2022, thousand UAH/ha

Source: monitoring of land relations (2023)

The regions with the highest arable land values in Ukraine are: Lviv – 95 thousand UAH/ha; Ivano-Frankivsk – 79 thousand UAH/ha; Rivne – 58 thousand UAH/ha; Zakarpattia – 43 thousand UAH/ha; Chernivtsi – 40 thousand UAH/ha and Kyiv – 79 thousand UAH/ha. The lowest cost of arable land is mainly in the southern regions of Ukraine: Zaporizhzhia – 23 thousand UAH/ha; Kherson – 24 thousand UAH/ha; Mykolaiv – 26 thousand UAH/ha; and Dnipro – 30 thousand UAH/ha. If look at the ratio of arable land value to the area alienated through sale and purchase, it is possible to see that with the highest arable land value of UAH 95.3 thousand per hectare in the Lviv region, only 3.2 thousand hectares were sold. At the same time, with the sold area of 34.2 thousand hectares in the Kharkiv region, the cost of arable land was 32.5 thousand UAH/ha.

On 24 February 2022, Ukraine experienced a full-scale military aggression that changed the lives of Ukrainians. These changes affected everything, including the market turnover of agricultural land. Monitoring of transactions related to the sale and purchase of ownership of agricultural land revealed that the activities of the State Land Cadastre of Ukraine were suspended for 76 days from

24.02.2022 to 06.05.2022, no transactions on the transfer of ownership of agricultural land were carried out, and the land market reopened on 6 May 2022 (Monitoring of land relations, 2023). With the reopening of the land market, the number of sale and purchase transactions decreased significantly: while in February, 15 000 agricultural land sales transactions were registered, in May, only 438 transactions were registered, a 96% decrease. At the same time, the area of land transferred into ownership through sale and purchase agreements also declined sharply: 28 000 hectares in February compared to 726 hectares in May, a 97% decrease (Monitoring of land relations, 2023).

Given the significant decline in agricultural land sales at the beginning of the war, their value has increased: in February 2022, the value of agricultural land was 28 thousand UAH/ha, while in May it was 35 thousand UAH/ha, an increase of 22%. From 24.02.2022 to 01.04.2023, the cost of arable land in Ukraine was recorded at 37 thousand UAH/ha. The highest price is observed in the western part of the country: Zakarpattia region – 46 thousand UAH/ha; Ivano-Frankivsk region – 75 thousand UAH/ha; Lviv region – 92 thousand UAH/ha (Fig. 6).

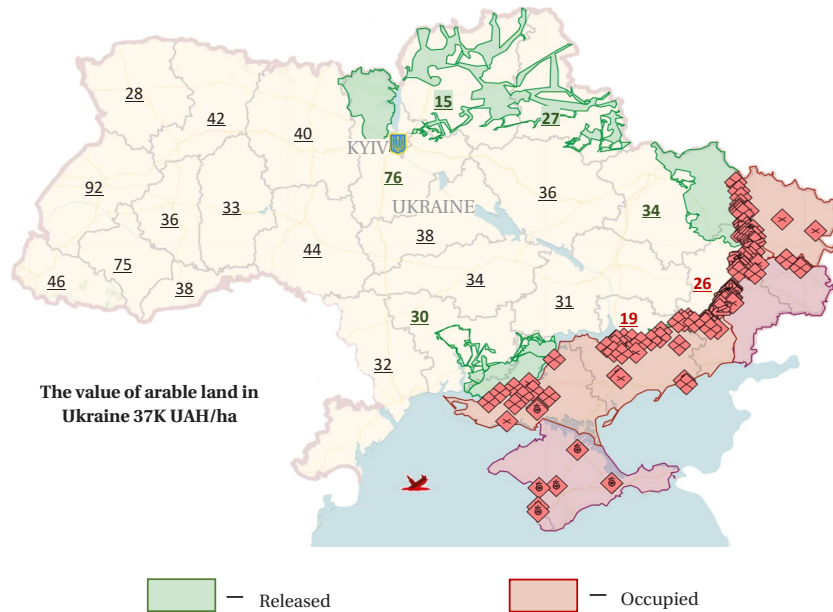


Figure 6. The cost of arable land by regions of Ukraine for 24.02.2022-01.04.2023, thousand UAH/ha
Source: monitoring of land relations (2023); DeepStateMAP (n.d.)

Due to the hostilities, the purchase/sale of agricultural land was resumed almost throughout the country, except for Kherson and Luhansk regions (no transactions were recorded in these regions during 24.02.2022-01.04.2023).

The study of the value of arable land in the regions where active hostilities took place showed that in some areas, the value of arable land did not decrease, but rather increased (Table 4).

Table 4. The value of arable land in areas where active hostilities were conducted

Region	The value of arable land 07/01/2021-02/24/2022, thousand hryvnias/ha	The value of arable land 24.02.2023-01.04.2023, thousand hryvnias/ha	Value ratio (+; -)
Kyivska	50.8	76	25.2
Kharkiv	31.2	34	2.8
Sumy	31.1	27	-4.1
Luhansk	30.1	h	h
Donetsk	29.1	26	-3.1

Table 4, Continued

Region	The value of arable land 07/01/2021-02/24/2022, thousand hryvnias/ha	The value of arable land 24.02.2023-01.04.2023, thousand hryvnias/ha	Value ratio (+; -)
Chernihiv	27.1	15	-12.1
Zaporizhzhia	24.8	19	-5.8
Kherson	24.0	h	h
Mykolaiv	23.3	30	6.7
Across Ukraine	33	37	4

Source: monitoring of land relations (2023)

The Kyiv region tops the list of conflict-affected regions in terms of arable land value. During the war, the value of arable land in the region increased to UAH 76 000/hectare, or by 33%. The most significant decrease in the value of arable land was recorded in the Chernihiv region (-80%), where the value of arable land amounted to UAH 15 000/hectare. In addition to these regions, the value of arable land decreased by 10% in Donetsk region, by 13% in Sumy region, and by 25% in Zaporizhzhia region. Comparing the general price changes for arable land in Ukraine between the pre-war and post-war periods, the downward trend in price is observed only in regions where hostilities have been/continue. In total, since the beginning of the war, the value of arable land in Ukraine has increased by 11%, reaching UAH 37 000/hectare. A study of transactions for the purchase/sale of agricultural land ownership rights in Ukraine shows that landowners are in

no hurry to sell their land. If in the pre-war period land purchase and sale contracts accounted for 30% of the total structure, then as of February 24, 2021, their share decreased by 4% and is at the level of 26%.

According to the study of agreements for the sale of agricultural land in Ukraine, after February 24, 2022, market agreements for the sale of land decreased by 96%. Luhansk and Kherson regions are the only regions where market operations were suspended at the beginning of the war and are currently not functioning. The value of arable land decreased by an average of 10% in most conflict-affected regions, while it increased by 11% in Ukraine as a whole. The study of the dynamics of the value of arable land gives reasons to claim that the highest value was recorded in November 2022, at the level of UAH 40 000/ha. In turn, the lowest value of arable land was at the beginning of the launch of the land market, in July 2021 – 25.8 thousand UAH/ha (Fig. 7).

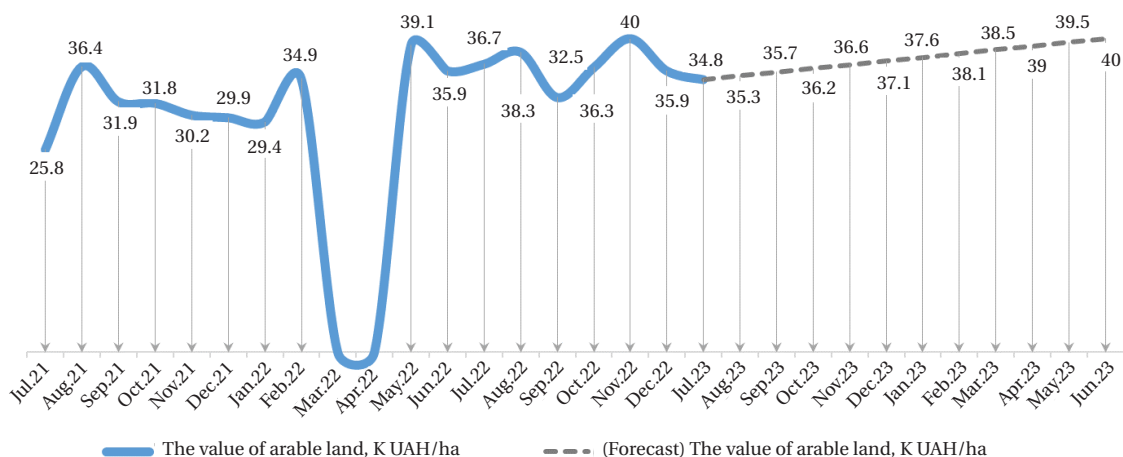


Figure 7. Dynamics of the value of arable land in Ukraine for 2021-2022, thousand UAH/ha

Source: monitoring of land relations (2023)

For March and April 2022, there are no value data on the market circulation of land, as sales agreements did not take place, as a result of the beginning of the war in Ukraine and non-working registers. To determine the forecast data of the cost of buying/selling arable land, the method of regression

analysis was used, according to the calculations of which, the value of arable land should increase during 2023, but the increase is not significant and is forecasted to a maximum of UAH 40 000/ha. The key indicators of the market circulation of agricultural land are presented in the Table 5.

Table 5. Key indicators of market turnover of agricultural land in Ukraine for 2021-2022

The cost of rural land appointment	30.3 thousand/ha
in particular: arable	32.2 thousand/ha
fallow	20.6 thousand/ha

Table 5, Continued

haymakers	13.5 thousand UAH/ha
pastures	11.6 thousand UAH/ha
The cost of rural land destination depending on their location (within):	
city	UAH 64 000/ ha
village	45.2 thousand/ha
outside the settlement	29.2 thousand/ha
The cost of the land plot in the village of appointment, depending on the intended purpose:	
Commodity agricultural production	UAH 33.6 thousand/ha
Farming	UAH 27.9 thousand/ha
Personal peasant economy	UAH 26.4 thousand/ha
Subsidiary peasant economy	UAH 85.8 thousand/ha
Individual gardening	UAH 273.6 thousand/ha
Collective gardening	UAH 671.2 thousand/ha
The number of concluded purchase and sale agreements, total	117 thousand
Area of registered purchase and sale agreements, total	267.6 thousand ha

Source: monitoring of land relations (2023)

The study of the functioning of the market circulation of agricultural lands shows that currently the market does not bring a positive effect, changes, or promotion of the development of the agricultural industry. There is a clear understanding that the market has achieved its main goal – it functions on the market's advice, because it does not solve any short-term, long-term or strategic problems of the agrarian industry. So far, the only thing the market has brought is the right to buy or alienate agricultural land.

► Discussion

The issue of market turnover of agricultural land is also the subject of research by foreign experts. A group of researchers from Poland, including M. Dacko *et al.* (2021), in their studies consider the dependence of the market value of agricultural land on changes in such features of the land plot as its area, shape, and access to public roads.

M. Rasva & E. Jürgenson (2022) found that the market turnover of agricultural land in Estonia requires stricter state regulation to overcome the concentration of agricultural land in “one hand”, which has a negative impact on the development of rural communities. Scientists have determined that one of the main ways to combat this phenomenon is to set a limit on the amount of land in possession. P. Prochazka *et al.* (2023) identified urbanization, rents, and subsidies as the main determinants of agricultural land price fluctuations. Short-term fluctuations in land prices are explained using an error correction model. The authors identify the impact of urbanization as the most important variable in the short-run of agricultural land prices in the Czech Republic. H. Kryszk *et al.* (2022) studied the role of the state in regulating the market turnover of agricultural land. In particular, the legal provisions aimed at limiting the purchase of land by the National Centre for Agricultural Support (NCAS) through the application of the pre-emptive right to purchase land in Poland (Kilnitska *et al.*, 2020).

A group of Slovak researchers consisting of J. Lazíková *et al.* (2021) analyse the functioning of agricultural land

markets in terms of the sustainability of agricultural production based on the correlation between land price and soil quality. The authors argue that land with low fertility tends to be sold at higher prices than land with good soil quality, leading to the risk of investors buying land for non-agricultural purposes and the risk of agriculture being displaced from certain areas. W.K. Korthals Altes (2023) extensively discusses the issue of new farmers' access to land on the market. The researcher analysed the European agricultural sector to determine the impact of its modernization on the farmland market and the difficulty of access to land for new entrants. The researcher concluded that the common European agricultural policy is in many ways an obstacle rather than an enabler to providing access to land for new farmers (Shyian & Kotelnikova, 2019).

J. Loughrey *et al.* (2019) draw attention to the lack of comprehensive statistics on the functioning of agricultural land markets in the EU and the impact of this factor on agricultural production. M. Kionka *et al.* (2021) conducted a study of the liquidity parameters of agricultural land markets and the relationship between liquidity and land prices. B. Britos *et al.* (2022) investigate the impact of farmland market imperfections on the allocation of land among different farmers and on overall agricultural productivity, holding other factors constant. C. Chen *et al.* (2022) assessed the impact of the land market on resource allocation and productivity in agriculture.

M. Gorgan & M. Hartvigsen (2022) provided an overview of the level of development of agricultural land markets in Eastern Europe and Central Asia, analysed and systematized the main constraints to the development of these markets, and proposed solutions to the identified problems. P. Bórawski *et al.* (2019) presented the results of a study on fluctuations in agricultural land prices in selected voivodeships of Poland in comparison with land prices in the EU countries for 1992-2016. M. Vijayabaskar & A. Menon (2018) in their study reveal the problem of buying up agricultural land by non-agricultural entities for the purpose of further resale at a higher price.

S. Zrobek *et al.* (2020) tested a universal methodological approach to calculating the value of agricultural land based on “fuzzy logic”. According to the researchers, this method is the most appropriate for emerging market models. The research of scientists on the market turnover of agricultural land is multifaceted and diverse. The practice of land market functioning in Ukraine is only being formed, so Ukraine should use the already existing positive experience of other countries to avoid negative phenomena. There are no studies of the functioning of the agricultural land market during the war in the scientific literature and works of scholars. Ukraine has become the country that demonstrates such experience. The market for agricultural land in the areas where military operations are ongoing or have been conducted raises many new questions, the answers to which will be provided later.

Analysing the research of foreign scientists (mainly EU countries) on the problems of functioning of the market turnover of agricultural land, it should be noted that the outlined range of issues under study helps to form an understanding of models and mechanisms for implementing the functioning of the land market. All this leads to the fact that foreign models of the land market are fundamentally different from the Ukrainian model. Moreover, the market turnover of agricultural land in Ukraine does not have such market elements as a “state land agency”, and such a mechanism of land redistribution as “pre-emptive right” needs to be significantly improved. Whereas in other countries the main purpose of this mechanism is to distribute land in favour of farmers and persons willing to engage in agricultural production, in Ukraine this mechanism is aimed at selling ownership rights to a land plot to the highest bidder.

At the current stage of Ukraine’s development, there is an unusual and conflict-prone situation. Despite the country’s focus on European development, including reform of land relations, the positive experience of the European Union is not being properly used and ignored. The process of building a European model of land relations in Ukraine is limited to declarative statements and has no concrete practical implementation.

► Conclusions

In 2021-2022, the share of sale and purchase transactions in the total structure of land ownership transfers was 26%. The total area of agricultural land, the ownership of which was transferred through sale and purchase agreements, is 267.6 thousand hectares or 0.6% of the total land area. There were no massive sales or purchases of land. The value of agricultural land in 2021-2022 is UAH 30.3 thousand per hectare and has a tendency to increase, but this

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increase is not significant. It was determined that the value of these lands exceeds the NMV by 18%. There are cases when the value of land intended for agricultural activities, the ownership rights to which are sold, is lower, equal to or almost equal to the NMV. Agricultural land has the highest value in urban areas, and the lowest value outside urban areas. After the full-scale military aggression, activity on the land market in Ukraine decreased by 96%. The hostilities on the territory of our country forced the suspension of purchase and sale transactions on the land market, but two months later the market continued to operate, taking into account the military situation in the regions. Kherson and Luhansk regions remained the only regions where market operations were suspended at the beginning of the war and did not resume until 01.04.2023.

An analysis of the dynamics of arable land prices in Ukraine before and after the war shows a decline in prices only in the regions where active hostilities took place. The value of arable land in Ukraine has increased to UAH 37 thousand per hectare or 11% since 24.02.2021. Landowners are in no hurry to sell their land. Before the war, land sale and purchase agreements accounted for 30% of the total, and as of 24.02.2021, their share is 26% (down 4%). The market turnover of agricultural land in Ukraine should be a tool aimed at strengthening and developing the agricultural sector, which requires the market to have a clearly defined, legally enshrined purpose for its functioning. For example, the goal of land market turnover may be the development of family farming, as is the case in all EU countries (Strapchuk & Mykolenko, 2022).

The scientific novelty of the work is formed by the results of the study, namely, the analysis of the market turnover of agricultural land through the study of land ownership transactions, including under martial law in Ukraine. The prospect of further research is to determine the efficiency of the market turnover of agricultural land, the compliance of the Ukrainian market model with the models of the European Union and the achievement of the main objectives of land reform.

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► Conflict of Interest

None.

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Обіг земель сільськогосподарського призначення в Україні: нові виклики та нові можливості

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► **Анотація.** Досвід ринкового обігу земель сільськогосподарського призначення в Україні показав, що несвоєчасний та недостатньо комплексний аналіз функціонування ринку землі може спричинити неправильні висновки та обмежити розуміння його динаміки та впливу на господарську ситуацію країни. Метою роботи було визначення основних тенденцій та показників ринкового обігу земель сільськогосподарського призначення в Україні шляхом дослідження угод купівлі-продажу прав власності на землі. Методичним інструментарієм досліджуваної проблеми стали загальнонаукові та спеціальні методи, а також метод порівняння та абстрактно-логічний. Основними результатами дослідження є вартісна та кількісна оцінка угод купівлі-продажу прав власності на землі сільськогосподарського призначення в Україні, що дає змогу визначити основні тенденції на земельному ринку. Окремі положення можна використати для формулювання стратегій розвитку земельних відносин в Україні. Встановлено кількість та частку угод купівлі-продажу прав власності на землі сільськогосподарського призначення в загальній структурі трансакцій. Визначено площі земель права власності на які були відчужені через купівлю-продаж. Розраховано вартість земель сільськогосподарського призначення залежно від їх віддаленості від населеного пункту, регіонального розташування та цільового призначення. Встановлено коливання вартості орних земель залежно від їх територіального розміщення та у загальній динаміці по місяцях. Визначено рівень активності суб'єктів ринкового обігу земель сільськогосподарського призначення загалом по країні та в розрізі областей. Досліджено результати та тенденції ринкового обігу земель сільськогосподарського призначення на територіях де велись чи ведуться бойові дії. Визначені основні ключові показники ринкового обігу земель сільськогосподарського призначення. Сформовано прогнозні дані вартості ріллі в Україні до кінця 2023 року. Встановлено невідповідність української моделі ринкового обігу земель сільськогосподарського призначення моделям, які функціонують в країнах Європейського Союзу. Результати дослідження можуть бути використанні для опрацюванні шляхів переорієнтації ринкового обігу земель сільськогосподарського призначення на Європейські засади функціонування, націленого на розвиток сімейного фермерства, як основоположної засадничої цілі аграрної політики України

► **Ключові слова:** ринковий обіг; сільськогосподарські угіддя; угоди; ринок; вартість; власність