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The Influence of Russia's Military Aggression on Ukraine's Agriculture

Abstract. The article provides information about losses suffered by the Ukrainian agriculture as a result of the full-scale armed Russian aggression. The analysis is based on values of the index of crop and livestock production across Ukraine's regions and a structural and dynamic assessment of cultivated areas of agricultural crops during the war. The authors analyze changes in the volume of production (gross harvest) of agricultural crops changed in natural terms as well as changes in sown areas and productivity. They also discuss the effectiveness of measures undertaken by the state to stimulate the development of the Ukrainian agricultural sector under martial law and the prospects of its post-war recovery.

Keywords: agriculture, economy, production, development, crop production, animal husbandry

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1. Introduction

Because of its favorable natural and climate conditions the agriculture has traditionally been the main sector of Ukraine's economy. The Ukrainian agricultural sector focuses on the production and processing of grain and oil crops, which guarantee the country's food and, to a certain extent, economic security. Given its enormous potential of agricultural production, Ukraine has been a major exporter of agricultural commodities. Despite significant losses suffered by agriculture as a result of the full-scale invasion of Russian troops, it is slowly recovering, although the spatial distribution of agricultural production across the country's regions, has changed considerably.

2. Review of the Literature

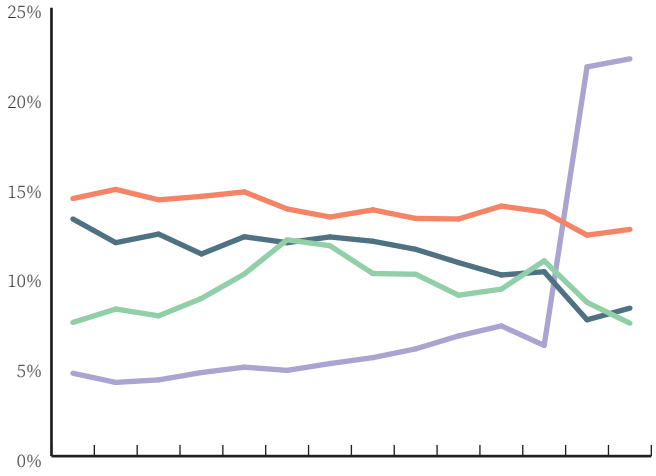
The strategic importance of agriculture in ensuring Ukraine's socio-economic development has been the subject of much research. For example, a comprehensive assessment of Ukraine's agro-processing industries across regions was carried out by Ishchuk S.O., Liakhovska O.V. (2020). Shevchenko A.A., Petrenko O.P. (2023) analyzed determinants of the economic development of Ukrainian agriculture. Vytoptova V.A. (2024) examined the current state of and main challenges faced by agricultural enterprises in wartime conditions, and she identified factors that hold back development and slow down the pace of Ukraine's agricultural recovery. Strategic directions of the regional development of agriculture in Ukraine were outlined by Lyudvenko D.V., Tomilova-Yaremchuk N.O., Krupa N.M., Khomyak N.V., Zabolotnyy V.S. (2023). Mogish O.M., Mykhailiuk O.B. (2024) investigated the role of international cooperation in the development of the agricultural sector, while Kovtun O., Kosylovych G., Andrushko O., Golyachuk Yu., Styurko M. (2024) studied how the strategy of sustainable rural development is implemented in the European Union and how it could be implemented in Ukraine.

The purpose of the following article is to assess development trends in agriculture across the regions of Ukraine in the conditions of a full-scale war.

3. Research Results

In 2021, more than 17% of Ukraine's employed population was involved in agriculture, which accounted for 10.89% of the country's gross domestic product (GDP). In other words, before the outbreak of the full-scale war, agricultural was

the second biggest contributing sector of the Ukrainian economy after trade. However, in 2023, it was only the fourth biggest (Fig. 1). Such structural changes are due to a significant deterioration in the dynamics of agricultural production during 2022–2023 (–18.4% of GDP at current prices), compared to foreign trade, in particular, processing industry (–3.8%), trade (+11.3%)) and state administration (+430.4%).



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Agriculture, forestry and fisheries	7.45	8.20	7.82	8.79	10.15	12.06	11.73	10.18	10.14	8.97	9.31	10.89	8.57	7.41
Processing industry	13.22	11.90	12.38	11.27	12.23	11.90	12.22	11.98	11.53	10.79	10.10	10.28	7.60	8.25
Wholesale and retail trade; repair of motor vehicles and motorcycles	14.36	14.87	14.29	14.48	14.73	13.78	13.33	13.73	13.25	13.22	13.94	13.61	12.32	12.64
Public administration; compulsory social insurance	4.62	4.11	4.25	4.66	4.96	4.78	5.16	5.49	5.98	6.70	7.26	6.17	21.70	22.15

Fig. 1. Share of basic activities in Ukraine's GDP (at current prices), %

Source: Based on data from SSSU (2023)

The war caused enormous damage to the Ukrainian agriculture. According to the World Bank (Ukraine third rapid damage and needs assessment, 2024), as of December 31, 2023, total losses of Ukraine's agricultural sector caused by the war amounted to $80.1 billion. The amount of direct damages from the loss of assets, particularly, the destruction of the Kakhovska dam, the partial or complete destruction of storage facilities, fisheries and aquaculture, perennial crops, the forced slaughter of livestock, as well as the destruction and theft of production resources and products is estimated at $10.3 billion. The largest share (57% or 5.87 billion US dollars) in the total volume of direct losses included losses from the damage and destruction of agricultural machinery (machines and equipment). $3.71 billion (36%) of the total losses were due to the theft of production resources

(18%) and damage to warehouses (18%). Other losses of assets amounted to another $0.72 billion (7%).

In addition to the loss of assets, Ukraine's agricultural sector suffered indirect losses of $69.8 billion, which include the underachieved income of agricultural producers and the increase in the cost of production. These losses were caused by a decrease in crop production (49% of total losses) and livestock (8%); a decrease in purchase prices for export-oriented agricultural products (35%); the increase in costs for production resources (6%); by reducing the production of perennial crops (1%); costs for reclamation of damaged land (1%). Compared to estimates from February 2023, these losses have more than doubled.

According to the Food and Agriculture Organization of the United Nations (FAO), 25% of Ukraine's rural population working in agriculture have either stopped operations or reduced production due to the war. In some regions that are heavily reliant on agriculture, this percentage ranges from 40% to 90% (FAO Country Profiles: Ukraine, 2024).

Losses in the Ukrainian agriculture sector have been significant due to the destruction of production facilities and infrastructure, disruptions in logistics, and a decrease in economic and consumer activity in the domestic market. These factors have had a negative impact on the operating environment for agricultural producers. For example, between February 24, 2022, and February 2024, 19.5% of agricultural product storage capacities were lost due to the destruction, excluding those located in the Russian-occupied territory (Center for Food and Land Use Research (KSE Agrocenter), 2024). The eastern and southern regions of Ukraine were particularly affected, with many elevators suffering damage. Furthermore, a large number of partner enterprises have ceased operations in areas such as sales, product processing, and raw material supply. One specific impact is that Ukraine's fertilizer market experienced a 50–60% decrease in 2022–2023 compared to 2021 (Recovery or further decline. Where is the Ukrainian fertilizer market headed?, 2024).

According to World Bank estimates, the total cost of restoring and reconstructing Ukraine's agrarian sector over the next 10 years is estimated at $56.1 billion USD (USA). This amount is needed to cover the cost of reconstructing or replacing damaged assets ($9.4 billion USD), to support the immediate resumption of production ($6.1 billion USD); to support the long-term recovery of production to extend value chains and increase added value in the agricultural sector ($35.5 billion USD); to cover the cost of improving production sustainability and supporting public institutions, including initiatives aimed at accelerating the EU accession ($5 billion USD).

In 2022–2023 the agricultural sector in Ukraine faced several challenges, including the lack of elevators and fertilizers, the need to find new partners and

suppliers due to a decline in business activity, and issues with access to energy resources, water supply, oils, and fuel. These difficulties led to a decrease in domestic demand for agricultural products and market activity, as well as labor force shortages due to considerable migrations. However, by the end of 2023, the situation with the provision of agricultural labor force stabilized, with approximately four job seekers for every agriculture vacancy according to the State Employment Service's data as of May 1, 2024 (State Employment Service, 2024).

According to the National Bank of Ukraine (NBU), employer surveys indicate that, compared to other economic activities, agriculture is not significantly limited by a shortage of staff, despite experiencing one (Table 1). The staffing issue in the agricultural sector is mainly due to structural changes in the available workforce, particularly the increasingly noticeable lack of male workers. Surveys attribute the shortage to the effects of migration and the mobilization of reservists.

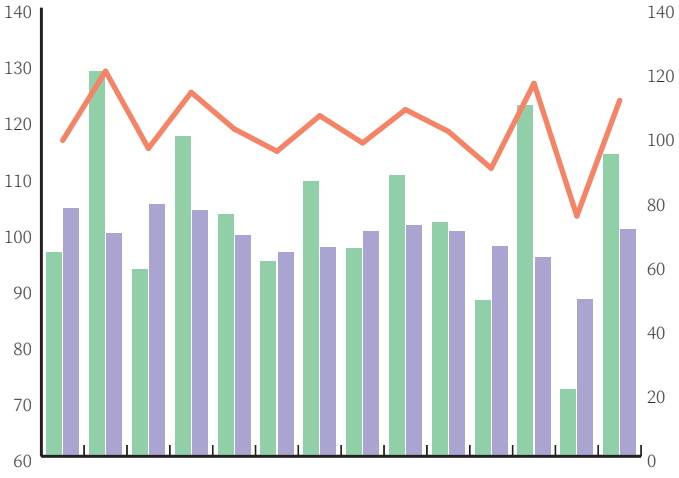
Table 1. Labor supply and the impact of labor shortages on enterprises in 2021 and 2023 by type of activity (% of responses)

Type of activity	2021		2023	
	Reported lack of staff	Activity held back by staff shortages	Reported lack of staff	Activity held back by staff shortages
Agriculture, forestry and fisheries	**95.1**	**22.0**	**49.5**	**26.8**
Mining and quarrying	87.8	26.8	75.0	36.4
Processing industry	86.4	25.2	80.0	56.7
Supply of electricity, gas, steam and air conditioning	93.1	6.7	70.0	13.3
Construction	84.2	35.0	95.0	70.0
Wholesale and retail trade; repair of motor vehicles and motorcycles	93.0	22.2	54.9	32.6
Transport, warehousing, postal and courier activities	78.0	26.8	70.0	34.4
Services	86.4	37.3	57.8	37.9

Source: Based on data from NBU (2024)

Despite the problems caused by the full-scale war, the overall level of agricultural production in Ukraine has remained consistent. In 2022, the agricultural production index decreased by 25% (crop production decreased by 28%), but increased by 11.1% in 2023 (with crop production increasing by 13.9%) (see Fig. 2). It is important to note that the trend was only violated in 2015 and 2020. The downward trend during these years was due to the disruption of economic ties (resulting from the Russian aggression) and reduced business activity (due to the COVID-19 pandemic). Additionally, lower yields, particularly for cereals (6%

decrease) and sunflowers (21.1% decrease in 2020), further contributed to the decline in the agricultural sector during these years.



	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Index of agricultural products	98,6	120,2	96,1	113,6	102,2	95,2	106,3	97,8	108,2	101,4	89,9	116,4	75,0	111,1
Crop production	96,4	128,7	93,3	117,1	103,1	94,8	109,1	97,1	110,2	101,8	87,9	122,6	72,0	113,9
Livestock products	104,3	99,8	104,9	103,9	99,5	96,4	97,3	100,2	101,2	100,2	97,5	95,4	88,0	100,4

Fig. 2. Indices of Ukraine's agricultural production

Source: Based on data from SSSU (2023)

In 2023, the index of agricultural production increased for all regions, except Zaporizhzhya, Lugansk, Sumy, and Kherson. However, despite the positive trend in Ukraine's agricultural production, its volumes (at constant 2021 prices) reached only 83% of the 2021 level. A modest increase (0.7% to 5.1%) was observed only for 5 regions of the western part of the country (Transcarpathian, Ivano-Frankivsk, Lviv, Rivne, and Ternopil), as well as in the Poltava region.

The basic segment of Ukrainian agriculture, namely crop production (which accounts for more than 80% of total agricultural production), recovered in 2023, especially in Vinnitsa (+28.5%), Kyiv (+29.6%), Nikolaev (+34.4%) and Odessa (+25.6%) regions. But as a result of two years of the war, crop production in Ukraine (at constant prices in 2021) decreased by 18.2%. The largest losses were recorded in Donetsk (−70.8%), Zaporizhzhya (−83.9%), Lugansk (−79.7%) and Kherson (−97.2%) regions.

A significant decrease in the crop production index is linked to a loss of acreage, which decreased by 20.2% during 2022–2023. The regions most affected were those involved in active conflict and those adjacent to them, such as Kherson, Zaporizhzhya, Lugansk, Donetsk, Kharkov, and Nikolaev. The decrease in sown

areas of agricultural crops in these regions ranged from 23.4% to 95.8% (Table 2). This led to changes in the regional structure of acreage, particularly in favor of Odessa (+1.69%), Kirovograd (+1.57%), Poltava (+1.52%), and Vinnitsa (+1.45%) regions. The loss of acreage also caused a significant shift in the structure of agricultural production in the Kherson region, where the share of crop production decreased by 32.54 percentage points (to 58.62%).

Table 2. Dynamics and regional structure of acreage of agricultural crops in Ukraine*

Region	Structure,%			Structural changes, pp				Growth rate, %		
	2014	2021	2022	2023	2022–2021	2023–2022	2023–2021	2022/2021	2023/2022	2023/2021
Ukraine	**100.00**	**100.00**	**100.00**	**100.00**	**0.00**	**0.00**	**0.00**	**−18.11**	**−2.55**	**−20.20**
Vinnytsia	5.94	5.72	6.97	7.17	1.25	0.19	1.45	−0.15	0.18	0.03
Volyn	1.96	2.18	2.62	2.60	0.44	−0.02	0.42	−1.48	−3.20	−4.63
Dnipropetrovsk	7.15	6.94	8.30	8.30	1.36	−0.01	1.35	−2.05	−2.63	−4.63
Donetsk	4.89	3.67	1.67	1.34	−2.00	−0.34	−2.34	−62.71	−22.11	−70.96
Zhytomyr	3.06	4.08	4.87	4.60	0.79	−0.28	0.52	−2.15	−8.06	−10.03
Transcarpathian	0.70	0.62	0.79	0.74	0.18	−0.06	0.12	5.15	−9.32	−4.64
Zaporizhzhya	5.97	5.98	2.61	1.20	−3.37	−1.41	−4.79	−64.28	−55.31	−84.04
Ivano-Frankivsk	1.38	1.34	1.66	1.65	0.32	−0.01	0.31	1.41	−3.04	−1.67
Kyiv	4.24	4.27	5.09	5.18	0.83	0.08	0.91	−2.26	−0.99	−3.23
Kirovograd	6.14	5.99	7.35	7.56	1.36	0.21	1.57	0.47	0.27	0.74
Lugansk	3.10	3.05	0.83	0.69	−2.23	−0.14	−2.36	−77.87	−18.75	−82.02
Lviv	2.31	2.51	3.19	3.28	0.68	0.09	0.76	3.96	0.15	4.11
Nikolaev	5.74	5.62	5.56	5.40	−0.07	−0.16	−0.23	−19.07	−5.35	−23.40
Odessa	6.79	6.49	7.90	8.18	1.41	0.28	1.69	−0.31	0.91	0.60
Poltava	6.31	6.09	7.39	7.61	1.30	0.21	1.52	−0.60	0.28	−0.32
Rivne	1.99	2.21	2.66	2.77	0.45	0.11	0.56	−1.34	1.38	0.02
Sumy	4.00	4.24	4.88	4.71	0.63	−0.17	0.47	−5.88	−5.90	−11.43
Ternopil	2.95	2.97	3.64	3.73	0.67	0.09	0.76	0.35	−0.22	0.13
Kharkiv	6.34	6.43	4.48	5.51	−1.95	1.03	−0.92	−42.97	19.92	−31.61
Kherson	5.25	5.21	0.56	0.28	−4.64	−0.29	−4.93	−91.12	−52.34	−95.77
Khmelnitsky	4.12	4.24	5.20	5.30	0.96	0.10	1.05	0.32	−0.69	−0.37
Cherkasy	4.41	4.29	5.19	5.34	0.89	0.16	1.05	−1.10	0.38	−0.73
Chernivtsi	1.12	1.08	1.32	1.36	0.24	0.04	0.28	0.42	0.29	0.71
Chernihiv	4.15	4.77	5.26	5.54	0.49	0.28	0.77	−9.70	2.57	−7.38

* The data do not include the territories temporarily occupied by the Russian Federation and part of the territories where hostilities are (were) taking place.

Source: Based on data from SSSU (2023)

Compared to 2021, the sown area of grain and leguminous crops in Ukraine decreased by 31.3%. sunflower — by 21.2%, vegetable crops — by 13.7%, pota-

toes — by 5.7%, and the area of plantations of fruit and berry crops decreased by 13.8%. At the same time, the sown area of sugar beet increased by 10.1%. The dynamics of sown areas was correlated with the volume of production (gross harvest) of agricultural crops in natural terms, which in 2023 amounted to: cereals and legumes: 59772 thousand tons (−30.5% of 2021), sugar beet: 13130 thousand tons (+21%), sunflower: 12760 thousand tons (−22.2%), potatoes: 21359 thousand tons (similar to 2021), vegetable crops: 8297 thousand tons (−16.5%), fruit and berry crops: 1996 thousand tons (−10.7%).

Between 2022 and 2023, wheat production in Ukraine decreased by 32.74%, and rye production dropped by 61.02%. On the other hand, the production of flour and cereal products decreased by only 5.74%, while the production of bread, bakery, and flour products decreased by 13.35% during this period.

The gross harvest of grain and leguminous crops in the regions of Donetsk, Zaporizhzhya, Lugansk, Kharkov, and Kherson dropped by more than 50% during the two years of the war. However, in 2023, all regions except those mentioned above, as well as Lviv and Rivne, grain production increased. Vinnytsia (+40.1%) and Odessa (+32.2%) regions experienced the highest increases.

In 2023, thanks to high yields, which were at or exceeded the level recorded in 2021 (except for vegetable crops), the total value of Ukrainian crop production amounted to UAH 904630 million, which was equal to 81.8% of the pre-war value. The largest increase in yield (+9.6%), compared to 2021, was observed in sugar beet production. This is the only segment of domestic crop production where production and acreage increased in 2023.

Compared to crop production (−18.2%), livestock production suffered fewer losses (−11.4% of total production at constant prices in 2021) during the two years of the war. The largest reduction in livestock production over the specified period occurred in Donetsk (−73.3%). Zaporizhzhya (−88.9%) and Kherson (−79.3%) regions. Also, the regions of Luhansk (−41.1%) and Kharkiv (−48.9%) suffered heavy losses in this segment. However, in 2023 Kharkiv reported the highest index (129.8%) of livestock production of all regions.

Livestock farming traditionally accounted for a smaller share of Ukraine's agricultural production and showed a clear downward trend. During 2012–2021, the value of this indicator decreased by 1.9 times (from 33.2% to 17.7%). The war caused certain changes in the structure of agricultural production in favor of livestock production, but this was the result of a reduction in acreage, primarily in the Kherson region. The Transcarpathian region (45.8% in the structure of agricultural products in 2023 versus 50.6% in 2012) and Ivano-Frankivsk region (36.3% versus 54.5%) specialize in animal production (Table 3). Livestock production also accounts for a significant (> 20%) share of the structure of agricultural

production in other the regions of the western part of the country and in the regions of Vinnitsa, Dnipropetrovsk, Kyiv and Cherkasy.

Table 3. Share of crop and livestock production in the structure of agricultural production, %*

Region	Crop production				Livestock products			
	2014	2021	2022	2023	2014	2021	2022	2023
Ukraine	**77.25**	**82.30**	**79.09**	**81.10**	**22.75**	**17.70**	**20.91**	**18.90**
Vinnytsia	75.22	71.36	65.17	70.53	24.78	28.64	34.83	29.47
Volyn	61.87	70.69	72.06	72.83	38.13	29.31	27.94	27.17
Dnipropetrovsk	73.97	79.43	77.20	78.96	26.03	20.57	22.80	21.04
Donetsk	76.45	81.68	69.76	83.00	23.55	18.32	30.24	17.00
Zhytomyr	74.37	83.31	82.26	83.09	25.63	16.69	17.74	16.91
Transcarpathian	53.08	52.63	53.60	54.17	46.92	47.37	46.40	45.83
Zaporizhzhya	82.66	91.66	85.79	94.11	17.34	8.34	14.21	5.89
Ivano-Frankivsk	54.58	63.31	63.03	63.66	45.42	36.69	36.97	36.34
Kyiv	69.77	75.77	73.16	77.69	30.23	24.23	26.84	22.31
Kirovograd	88.27	91.06	89.65	90.67	11.73	8.94	10.35	9.33
Lugansk	80.37	92.42	80.45	80.76	19.63	7.58	19.55	19.24
Lviv	65.34	71.53	73.25	73.76	34.66	28.47	26.75	26.24
Nikolaev	85.17	92.24	89.31	91.84	14.83	7.76	10.69	8.16
Odessa	87.20	92.03	88.92	91.07	12.80	7.97	11.08	8.93
Poltava	82.09	85.65	86.37	86.63	17.91	14.35	13.63	13.37
Rivne	70.69	78.41	78.13	78.07	29.31	21.59	21.87	21.93
Sumy	85.83	88.50	90.92	91.24	14.17	11.50	9.08	8.76
Ternopil	80.72	82.32	81.00	81.81	19.28	17.68	19.00	18.19
Kharkiv	83.88	88.00	89.79	90.52	16.12	12.00	10.21	9.48
Kherson	80.34	91.16	59.33	58.62	19.66	8.84	40.67	41.38
Khmelnitsky	79.02	84.16	81.37	82.24	20.98	15.84	18.63	17.76
Cherkasy	66.99	71.56	69.33	72.22	33.01	28.44	30.67	27.78
Chernivtsi	68.13	74.62	73.69	76.16	31.87	25.38	26.31	23.84
Chernihiv	84.09	90.07	88.47	89.81	15.91	9.93	11.53	10.19

* The data do not include the territories temporarily occupied by the Russian Federation and part of the territories where hostilities are (were) taking place.

Source: Based on data from SSSU (2023)

On January 1, 2024, the number of farm animals in Ukraine was significantly lower than on the same day in 2021. Decreases were observed for cattle (cows and bulls) (–25%), including a 24.5% decrease in the number of cows, pigs (–13.3%); sheep (–20.5%) and poultry (–8%). These declines resulted in reduced production of key livestock products over the two-year period of war: meat (–8.15%,

down to 2239.5 thousand tons) milk (−14.73%, down to 7430.4 thousand tons). eggs (−19.13%, down to 11379.4 million units), and wool (−20.71%, down to 1187 tons). However, the value of agricultural products sold increased during this period, particularly in the case of meat and dairy products., which saw increases of 46.93% and 13.48%, respectively.

There is a consistent upward trend in the share of enterprises engaged in the production of animal products. Between 2010 and 2023, this share increased by 18.0 percentage points from 40% to 58%. Over the past two years, the share of industrial production of animal products has increased by 4.8 percentage points. This trend has positive consequences, especially in the dairy segment, due to higher productivity of enterprises compared to that of households. However, due to continuing wartime hostilities, the dairy sector suffered significant losses, particularly in dairy farms. Prior to the full-scale invasion of Ukraine, there were 1781 functioning milk production farms. By the end of 2022 their number decreased to 1440 and by the end of 2023 it further decreased to 1309 enterprises.

In 2023, the number of cows in the industrial sector continued to fall in most regions, with the exception of Mykolaiv (+0.5 thousand heads or +8.1%), Ternopil (+0.6 thousand heads or +3.7%), and Kharkiv (+1 thousand heads or +5%). Kharkiv is actively restoring its agricultural sector, which suffered significantly from the Russian occupation.

Despite the overall decrease in the number of cows in Ukraine, two-thirds of the regions saw an increase in industrial milk production due to improved productivity. As a result, the volume of milk delivered by processing enterprises returned to the 2021 level, with the share of this kind of milk in the total processing structure increasing to 89.1% (compared to 81.8% before the full-scale invasion). The share of extra milk reached 49% (Milk map of Ukraine, 2024). As of January 1, 2024, the regions of Poltava, Cherkasy, Chernihiv, Kyiv, and Vinnytsia were leaders in industrial milk production. Collectively, dairy farms in those areas accounted for 51.4% of industrial cows in Ukraine and provided 72.5% of milk delivered for processing.

4. Conclusions

The key trends and problems affecting Ukrainian agriculture (direct and indirect losses due to the war, a reduction in sown areas, unstable dynamics of yield and specialization of agricultural production) over the past two years have changed the spatial distribution of this economic sector. In particular, within the overall structure of agricultural production, declines in contributions were observed in

the regions of Donetsk, Zaporizhzhya, Lugansk, Nikolaev, Kharkov and Kherson. At the same time, the traditional leaders in the domestic agricultural production, namely the regions of Vinnitsa, Dnepropetrovsk, Kyiv, Kirovograd, Poltava, Khmelnitsky and Cherkasy, significantly increased their contributions (both in crop and livestock production).

Despite Ukraine's difficult political and economic situation, the state actively supports agriculture, particularly by compensating family farms for the paid the Uniform Social Tax and providing them with loans and subsidies. The state also offers guarantee instruments (which cover 50% or 80% of the risk) to creditors who finance agriculture in regions located close to areas where war hostilities are taking place. There is also a state program of partial compensation (25%) of the cost of agricultural machinery of domestic production, which has been joined by more than 100 machine-building enterprises. The list of agricultural machinery and equipment, which can be purchased using state co-financing has increased to 8705 units. In addition to providing farmers with a way to purchase the necessary equipment on favorable terms, the partial compensation program stimulates the development of the domestic engineering industry for the need of the agro-industrial sector.

The restoration and further development of Ukraine's agriculture will be significantly enhanced with the enactment of the Law "On Agrarian Notes", which will come into effect in early 2025. This law introduces a new financial instrument, namely non-emission securities (agrarian notes), which will operate electronically. It is anticipated that the use of this tool will simplify Ukrainian agricultural producers' access to funding and ensure a deeper integration of the agricultural sector with capital markets, including international ones. The new law also allows foreign investors to access agricultural notes, which will significantly increase the possibility of additional financing for domestic agriculture. Furthermore, the new law expands the use of agricultural notes to more sectors of agriculture that are not covered by the current law "On Agricultural Receipts.", such as livestock production, poultry farming as well as more specialized segments, such as sheep breeding, beekeeping, etc. Agricultural notes can also be utilized in the primary processing segment, for example, in the production of sugar, oil, flour, starch, tomato paste, etc. Ultimately, agrarian notes will be able to finance all value chains in Ukraine related to agricultural production.

References

Center for Food and Land Use Research (KSE Agrocenter). (2024). https://kse.ua/wp-content/uploads/2024/02/RDNA3_ukr.pdf [in Ukrainian].

FAO Country Profiles: Ukraine. (2024). https://www.fao.org/countryprofiles/index/en/?iso3=UKR

Ishchuk, S.O., & Liakhovska, O.V. (2020). *Rozvytok ahropererobnykh vyrobnytstv u rehionakh Ukrayiny: syrovynni aspekty: naukove vydannya* (Development of agro-processing industries in the regions of Ukraine: raw materials aspects: scientific edition). State Institution "Institute of Regional Research n.a. M.I. Dolishniy of NASof Ukraine". http://ird.gov.ua/irdp/p20200034.pdf [in Ukrainian].

Kovtun. O., Kosylovych, G., Andrushko, O., Golyachuk, Yu., & Styurko, M. (2024). Yevropeys'ka polityka staloho rozvytku sil's'koho hospodarstva: vyklyky dlya Ukrayiny (European policy of sustainable development of agriculture: challenges for Ukraine). *Ekonomichni horyzonty*, *2*(28), 119–138. http://eh.udpu.edu.ua/article/view/305867 [in Ukrainian].

Lyudvenko, D.V., Tomilova-Yaremchuk, N.O., Krupa, N.M., Khomyak, N.V., & Zabolotnyy, V.S. (2023). Priorytetni napryamy finansovo-ekonomichnoho rozvytku sil's'koho hospodarstva rehioniv u povoyennyy period v Ukrayini (Priority directions of financial and economic development of regional agriculture in the post-war period in Ukraine). *Ukrayins'kyy ekonomichnyy chasopys, 2*. 46–53. https://doi.org/10.32782/2786-8273/2023-2-9 [in Ukrainian].

Milk map of Ukraine. (2024). https://storage.avm-ua.org/uploads/2022/molukr.pdf [in Ukrainian].

Mogish, O.M., & Mykhailiuk, O.B. (2024). Rol' mizhnarodnoho spivrobitnytstva u rozvytku sil's'koho hospodarstva (The role of international cooperation in the development of agriculture). *Naukovyy visnyk Uzhhorods'koho universytetu. Seriya «Ekonomika», 1*(63), 47–52. http://visnyk-ekon.uzhnu.edu.ua/article/view/303103 [in Ukrainian].

NBU. (2024). Inflation report. April 2024. https://bank.gov.ua/ua/news/all/inflyatsiyniy-zvit-kviten-2024-roku [in Ukrainian].

Recovery or further decline. Where is the Ukrainian fertilizer market headed? (2024). https://agroportal.ua/publishing/intervyu/vidnovlennya-chi-podalshe-padinnya-kudi-ruhayetsya-ukrajinskiy-rinok-dobriv [in Ukrainian].

State Employment Service. (2024). Statistical information files. https://dcz.gov.ua/stat/statfile [in Ukrainian].

SSSU. (2023). State Statistic Service of Ukraine. https://ukrstat.gov.ua [in Ukrainian].

Shevchenko, A.A., & Petrenko, O.P. (2023). Determinanty ekonomichnoho rozvytku sil's'koho hospodarstva v Ukrayini (Determinants of economic development of agriculture in Ukraine). *Modern Economics*, 38, 186–193. http://lib.osau.edu.ua/jspui/bitstream/123456789/4459/1/12.pdf [in Ukrainian].

Ukraine third rapid damage and needs assessment. (2024). https://documents1.worldbank.org/curated/en/099021324115085807/pdf/P1801741bea12c012189ca16d95d8c2556a.pdf

Vytoptova, V.A. (2024). Doslidzhennya stanu ta problem sil's'koho hospodarstva Ukrayiny v umovakh voyennoho chasu (Study of the state and problems of agriculture in Ukraine in wartime conditions). *Ahrarni innovatsiyi*, 23, 210–213. http://agrarian-innovations.izpr.ks.ua/index.php/agrarian/article/view/575/594 [in Ukrainian].

Wpływ rosyjskiej agresji zbrojnej na rolnictwo Ukrainy

Streszczenie. Artykuł prezentuje informacje o stratach poniesionych przez ukraińskie rolnictwo w wyniku pełnoskalowej zbrojnej agresji Rosji. Przedstawiona analiza opiera się na wartościach wskaźnika produkcji roślinnej i zwierzęcej w poszczególnych obwodach Ukrainy oraz na ocenie struktury i dynamiki zmian powierzchni upraw rolnych w czasie wojny. Autorki analizują zmiany wielkości produkcji (zbiorów brutto) upraw rolnych, a także zmiany powierzchni zasiewów i produktywności. Omawiają również skuteczność działań podejmowanych przez państwo w celu stymulacji ukraińskiego sektora rolnego w czasie trwania działań wojennych oraz perspektywy jego powojennej odbudowy.

Słowa kluczowe: rolnictwo, gospodarka, produkcja, rozwój, produkcja roślinna, hodowla zwierząt