

## EXPORT POTENTIAL OF AGRICULTURAL-INDUSTRIAL COMPLEX OF UKRAINE: LOGISTICS AND DEVELOPMENT PROSPECTS

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### Abstract

*The article describes the current state, retrospective, and perspective of the development of the export potential of the agricultural sector of the Ukrainian economy. The share of agricultural exports in the structure of the total export of goods from Ukraine was analyzed. The geographical structure of the export of goods from Ukraine, in particular the agro-industrial complex, was studied. Special attention was paid to the issue of the change in the structure of the export of goods in 2022. The structure of the export of products from Ukraine, in particular agricultural products, was studied in terms of partner countries. Special attention was focused on considering changes in the structure of exports in 2022 in Ukraine. In 2022, the logistics of exporting agricultural products became significantly more complicated. Neighbouring European countries felt a significant burden during the restructuring of the logistics channels for the export of Ukrainian agricultural products before the opening of the «grain corridor». Customs crossings, railway infrastructure and the infrastructure of sea and river ports of the European Union countries were fully involved. In the article, we substantiated that in order to unblock the export of agricultural products from Ukraine through the domestic Black Sea seaports, the significant burden of building export logistics flows was taken on by European neighboring countries, which fully utilized all their logistics infrastructure. In 2022, there was a reduction in the export of agricultural products, and in 2023, its further decline is predicted. Using the example of grain crops, polynomial approximation was used to forecast their gross harvest, as well as calculate domestic consumption and export potential in 2023. The study indicates that in 2023, export revenue from the sale of grain crops should be expected to be more than twice as much as in 2021.*

**Key words:** export potential, agricultural-industrial complex, logistics, agricultural enterprise

### INTRODUCTION

Currently, Ukraine has a developed agricultural sector, which creates significant economic advantages for it, as it is largely export-oriented. At the same time, during the last decade, agriculture in Ukraine occupies the structure of gross added value from 8.4% in 2010 to 12.4% in 2021, when it was the third sector of the domestic economy in terms of the share of the formation of gross added value.

The main share of the gross added value in Ukraine is created by the industry, which accounts for 21% to 25% of the gross added value, the second is wholesale and retail trade with a share of more than 16% in the structure of the country's gross added value.

Along with this, it is the agrarian sphere that is an important source of foreign exchange earnings. Export volumes of agrar products are constantly growing. According to analysts of the Ukrainian Agrarian Business Club, according to the results of 2021, agricultural

products were exported for a total amount of 27.8 billion USD, which is 41% of all Ukrainian exports. Compared to 2020, this indicator increased by 25%. Crop products account for the largest share of Ukrainian exports of agricultural products. In 2021, it accounts for 15.6 billion USD or 56% of the total export of agricultural products. The smallest export revenue came from the livestock industry. Thus, in 2021, these products were exported in the amount of 1.4 billion USD, which is only 5% of the total export of agricultural products [30].

Many works of various scientists and practitioners are devoted to the study of the problems of the efficiency of the export of agricultural products.

It accounts for 56% of the total export of agricultural products, which made it possible to obtain \$15.6 billion in export revenue. The livestock sector generated the lowest export revenue. In 2021, the export of this product amounted to \$1 billion or 5% of the total volume of exports of products of the agro-industrial complex. [1]

Many scientists and practitioners devoted their research to the problems of the efficiency of export of agricultural products.

In this aspect, it is especially worth highlighting the works of such researchers as M. Dziamulych [1-10], I. Lazaryshyna [11], A. Marcuta [12], T. Nestorenko [14-15], A. Popescu [16-26], N. Serdiuk [27], T. Shmatkovska [28-29], S. Voloshyna [32], I. Voronenko [33], and many others.

## MATERIALS AND METHODS

The study provides an assessment of the dynamics of the export of agricultural products in retrospect and its projected value in 2023. For this, it is necessary to evaluate and determine the role of performance indicators that affect the country's export capabilities, in particular, the logistics capacity of the corresponding types of transport and other infrastructure, changes in the size of cultivated areas, and productivity agricultural crops.

Conducting research is based on the use of the following methods and methodological approaches: analysis and synthesis, structural analysis, historical method, and graphic and tabular methods – for visual display of research results. Data visualization was carried out using Microsoft Excel version 2016.

Statistical data contained in the databases of the State Statistics Service of Ukraine, as well as analytical materials of various agricultural information and analytical agencies, were used for calculations.

## RESULTS AND DISCUSSIONS

Ukraine successfully exports tens of billions USD worth of goods and services every year, and it is the export of goods that occupies the lion's share of its overall structure (Fig. 1).

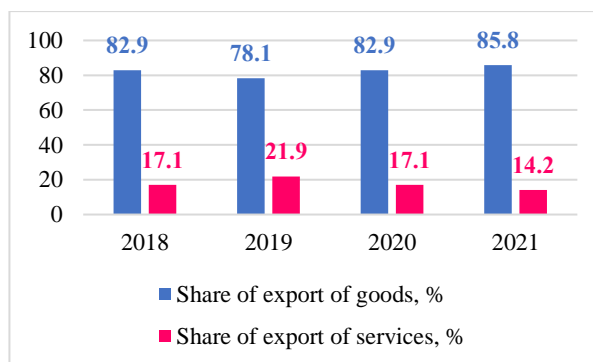


Fig. 1. The structure of exports of goods and services of Ukraine

Source: calculated by the authors based on [30].

In the structure of export of goods and services in 2018, the share of export of goods is about 83%. The total volume of exports of goods and services in 2018 amounted to 59.2 billion USD, of which 47.3 billion USD accounted for the export of goods. In 2019, the export of goods and services amounted to 64.1 billion USD, including the export of goods – 50.1 billion USD, i.e. 78.2% of the total export structure. 2019 is characterized by the lowest share of exports of goods during the period under review. In 2021, in the structure of Ukraine's exports, the share of exports of goods was the largest and amounted to 85.8%.

Examining the volume of exports of goods from Ukraine, it is advisable to emphasize that a significant share, on average more than 41.5% over the last five years, is the export of agricultural products and the food industry (Table 1).

In 2018, exports of goods and services amounted to \$59.2 billion, with a share of exports of goods of about 83%, i.e. \$47.3 billion. In 2019, the total volume of exports increased to \$64.1 billion, while exports of goods amounted to \$50.1 billion, which accounted for 78.2% of the total export structure. The lowest specific weight of the export of goods for the analyzed period was recorded in 2019. In 2021, the specific weight of the export of goods in the export structure of Ukraine was the largest and amounted to 85.8%.

It should be noted that over the past five years, a significant share, on average over 41.5%, of the structure of exports of goods from Ukraine has been occupied by the export

of products of the agro-industrial complex and the food industry (Table 1).

Analyzing the change in the domestic export of goods in 2018-2021, it is appropriate to note that the export of agricultural and food industry products and the export of mineral products show the most positive dynamics. In 2021, the business received more than USD 9.2 billion more from the export of agro-industrial complex and food industry products than in 2018, i.e., the increase was 49.7%. Analyzing the changes in the domestic export of goods from 2018-2021, it should be noted that the export of products of the agro-industrial complex and the food industry, as well as the export of mineral products, showed the most positive dynamics. In 2021, the increase in exports of agricultural and food industry products compared to 2018 amounted to more than \$9.2 billion or 49.7%. In 2021, there is a significant increase in the export of products of the metallurgical complex – by more than 4.3 billion USD.

Table 1. Export of goods from Ukraine in 2018-2021, million USD

Indicator	2018	2019	2020	2021	Deviation, 2021 to 2018, +/-
Products of agriculture and food industry	18,612.8	22,144.2	22,179.4	27,875.3	9,262.5
Production of the metallurgical complex	11,633.1	10,255.7	9,030.0	15,992.5	4,359.4
Mechanical engineering products	5,475.1	5,528.1	5,405.8	6,120.2	645.1
Mineral products	4,340.0	4,866.5	5,331.6	8,414.4	4,074.4
Products of the chemical industry	2,565.8	2,652.3	2,702.8	3,920.8	1,355
Wood and paper pulp	2,043.6	1,838.1	1,814.6	2,540.6	497
Various industrial goods	1,449.4	1,585.1	1,649.3	1,250.0	-199.4
Products of the light industry	1,220.3	1,184.7	1,078.4	1,975.5	755.2
Total export of goods	47,340.1	50,054.7	49,191.9	68,089.3	20,749.2

Source: calculated by the authors based on [30].

From the export of mineral products, the increase in foreign exchange earnings in 2021 compared to 2018 amounted to more than 4 billion USD.

At the same time, the increase in the export of mineral products in 2021 compared to 2018 was 93.9%, that is, it has almost doubled in four years.

Among the main partner countries that exported Ukrainian goods in 2018-2021, the following can be distinguished: the European Union, China, Turkey, India, the Russian Federation, Belarus, and the USA (Table 2).

Table 2. Structure of exports of goods from Ukraine by country in 2018-2021, %

Indicator	2018	2019	2020	2021	Deviation, 2021 to 2018, +/-
European Union	42.6	41.5	37.8	39.4	-3.2
China	4.6	7.2	14.4	11.8	7.2
Turkey	5.0	5.2	5.0	6.1	1.1
Russian federation	7.7	6.5	5.5	5.0	-2.7
India	4.6	4.0	4.0	3.7	-0.9
Egypt	3.3	4.5	3.3	2.9	-0.4
Belarus	2.8	3.1	2.7	2.2	-0.6
USA	2.3	2.0	2.0	2.4	0.1
Other countries of the world	27.1	26.0	25.3	26.5	-0.6

Source: calculated by the authors based on [30].

The European Union and China are the largest trade partners for the export of goods from Ukraine. The dynamics we observe in Table 2 indicate that the share of the European Union in the export of Ukrainian goods is decreasing, while China has significantly strengthened its position as a partner country. Since 2018, the export of Ukrainian goods to China has increased by 7.2 points.

We believe that taking into account the full-scale invasion of the Russian Federation into the territory of Ukraine, the structure of the export of Ukrainian goods to partner countries will change significantly. Of course, the Russian Federation and Belarus will be excluded from these. The structure of product positions will also change significantly. The share of the metallurgical complex in the structure of domestic exports will obviously be significantly reduced due to logistical problems, as well as due to the concentration of metallurgical enterprises in the East of Ukraine, their destruction or reduction of production volumes. In particular, Ukraine lost such metallurgical enterprises as Azovstal, the Mariupol Metallurgical Plant named after Ilich, etc. It is also impossible to relocate this type of business to safer regions of Ukraine, even with the largest state support for this process.

The structure of the export of services by partner countries is somewhat different. The main consumer of services from Ukraine is the European Union. In general, the countries of the European Union export more than a third of services from Ukraine every year.

The situation regarding significant volumes of export of services to the Russian Federation is quite unclear. In general, for the period 2018-2021, the export of services to the Russian Federation amounted to 14,112.7 million USD. The significant volume of exports to the Russian Federation, the total amount of exports of goods and services during the study period was more than 27,120.2 million USD, poses significant economic and security risks for Ukraine. The situation regarding significant volumes of service exports to the Russian Federation remains unclear and leads to significant economic and security risks for

Ukraine. During the period of 2018-2021, the total volume of exports of goods and services to the Russian Federation amounted to \$14,112.7 million. In general, the amount of exports of goods and services to the Russian Federation for the period under review amounted to more than 27,20.2 million US dollars. 2022 is indicative of this statement. Ukraine's annual losses from the suspension of financial relations with the Russian Federation will be painful for the national economy. In general, during the study period, we observe a significant reduction in exports to the Russian Federation. In 2021, the share of exports of services to the Russian Federation was 15.2%, while in 2018 this indicator exceeded 28%. In 2021, the specific weight of the export of services to the Russian Federation decreased by almost two times compared to 2018 - to 15.2%.

Table 3. Structure of export of services from Ukraine by country in 2018-2021, %

Indicator	2018	2019	2020	2021	Deviation, 2021 to 2018, +, -
European Union	32.9	28.6	38.7	34.6	1.7
Russian federation	28.1	39.7	22.9	15.2	-12.9
USA	8.2	8.2	12.3	15.3	7.1
Switzerland	7.5	6.3	6.8	9.3	1.8
UAE	2.2	2.3	2.9	3.2	1
Israel	1.7	1.6	1.9	2.3	0.6
Turkey	1.5	1.3	1.3	1.4	-0.1
China	0.9	1.2	1.1	0.8	-0.1
Other countries of the world	27.1	26	25.3	17.9	-9.2

Source: calculated by the authors based on [30].

In the structure of export of services, the share of the USA is growing significantly. During the last five years, it has almost doubled. To a large extent, this is related to the change in the structure of the types of services that are exported from Ukraine. In 2018, the export of computer and information services from Ukraine amounted to 2,044.2 million USD, i.e. 17.2% in the structure of export of services. In 2021, the export of computer and information services brought USD 4,032.0 million in foreign exchange earnings and accounted for 31.5% of the structure of the export of services.

The sphere of providing transport services is the most effective in terms of the formation of export foreign exchange earnings. In 2019,

58.3% of export foreign currency earnings were generated due to the provision of transport services, i.e. 9,109.9 million USD. In 2021, the share of transport services in the export of services from Ukraine decreased and amounted to 36.4%, i.e. 4,657.5 million USD. In terms of value, export revenue from the provision of transport services in 2021 has almost halved compared to 2019.

Figure 2 shows the structure of the export of services from Ukraine in terms of types of activity on average during the study period. Transport services are an area that forms almost half of the export foreign exchange earnings.

In 2021, export revenue from the provision of transport services decreased to \$4,657.5 million and accounted for 36.4% of the structure of exports of services from Ukraine. It is worth emphasizing that in 2021, compared to 2019, export revenues from the provision of transport services decreased by almost two times.

Characterizing the structure of export of services from Ukraine by type of activity, it is appropriate to emphasize that transport services are the sphere that provides about half of the foreign exchange earnings from exports. Over 21% of the structure of export of services is occupied by computer and information services. As we have already noted, their share is growing dynamically every year.

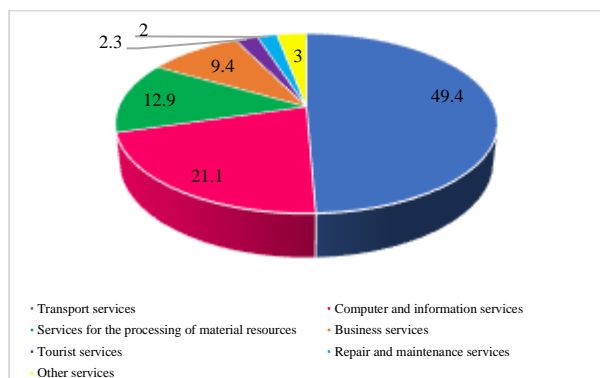


Fig. 2. The structure of export of services from Ukraine by type of activity, on average during the study period, %

Source: calculated by the authors based on [30].

12.9% and 9.4% in the structure of export of services are occupied by services for the

processing of material resources and business services, respectively. Other types of services occupy an insignificant part in the structure of exports, within the range of 2.3% or less.

The agricultural sector in Ukraine has recently been called the locomotive of the national economy. In the structure of the export of goods from Ukraine, the share of agricultural products and the food industry is from 39.3% in 2018 to 53.0% in 2022.

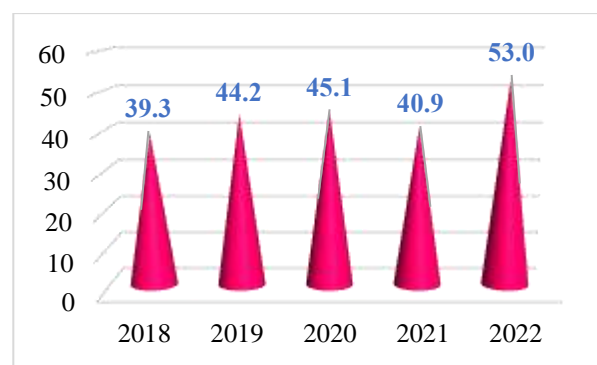


Fig. 3. The specific weight of agricultural products and the food industry in the structure of exports of goods from Ukraine in 2018-2022, %

Source: calculated by the authors based on [30].

The agricultural sector of Ukraine plays an active role in stabilizing the foreign exchange market, and reducing unemployment, as it provides orders, and therefore also the work of workers in related industries.

Analyzing the commodity structure of the export of agricultural and food industry products from Ukraine, we can note the following. In value terms, the volume of exports of live animals and products of animal origin in 2021 compared to 2018 increased by 0.1 billion USD, and the share of this group in the structure of exports of agricultural products decreased in 2021 by 1.8 percentage points (Fig. 4). In 2021, Ukraine received \$1.3 billion from the export of live animals and products of animal origin, which is \$0.1 billion more than in 2018. At the same time, the specific weight of this group in the structure of agricultural exports decreased in 2021 year by 1.8 percentage points (Fig. 4). In 2022, the volume of exports for this group increased by 0.2 billion USD compared to 2021, and the share increased by 1.7 percentage points.

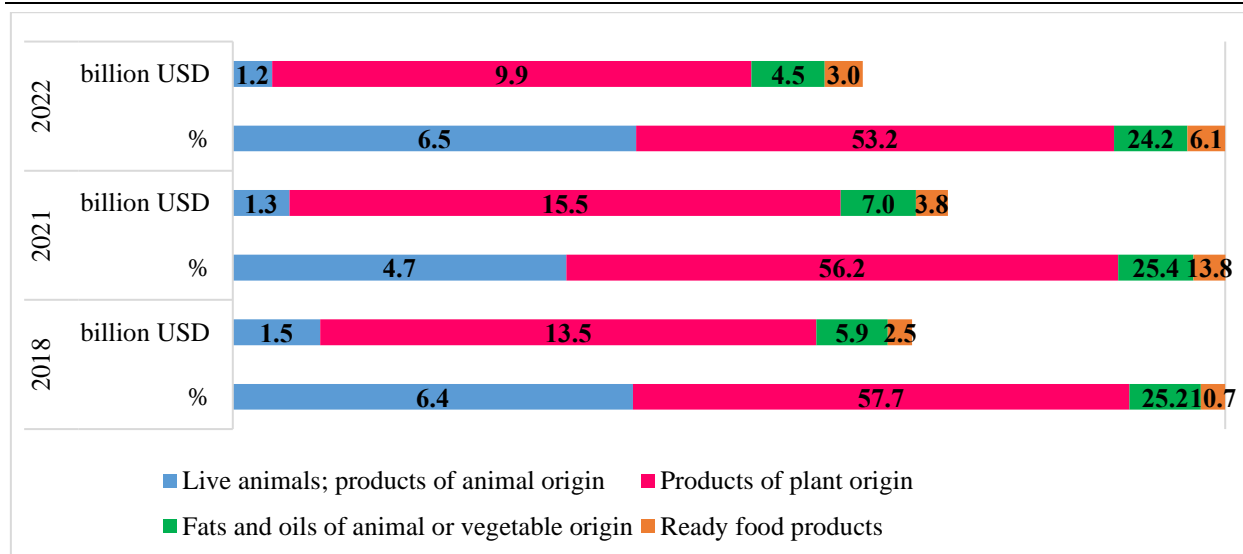


Fig. 4. Value structure of exports of agricultural products and food industry from Ukraine in 2018-2022  
 Source: calculated by the authors based on [30].

The number of export revenues from the sale of plant products in 2021 compared to 2018 increased by 5.6 billion USD, while their share in the structure and export of agricultural products increased by only 3.0 percentage points. In 2022, compared to 2021, the export of plant products decreased by 2.0 billion USD, but the share in the structure of the export of products of the agricultural sector increased by 1.5 percentage points. This indicates that in 2022, after the start of large-scale hostilities, the structure of agricultural exports underwent significant changes.

The amount of animal or vegetable fats and oils exported from Ukraine to the EU has increased significantly. In 2018, the export of this group of goods in value equivalent amounted to 4.5 billion USD, and in 2021 it increased to 7.0 billion USD, although it decreased in 2022 to 5.9 billion USD. In the structure of exports, the share of this group of goods has increased and fluctuated within 25%.

According to the accepted classification, the structure of exports of agricultural products and the food industry includes 4 groups of goods, each of which includes separate types of goods, of which there are 24 in total.

Characterizing the export of agricultural products and the food industry in Ukraine, four types of goods can be distinguished, which bring the lion's share of export

revenue in this direction (Table 4). Ukraine exports products of the agro-industrial complex and the food industry, four main types of goods can be distinguished, which provide a significant part of export revenues in this area of activity (Table 4).

The largest share in the structure of export of agricultural products is grain crops. During 2018-2022, grain exports are increasing. In 2018, the share of grain exports exceeded 22% in the structure of exports of agricultural products and the food industry, and in 2021, the share of grain exports increased to 25.5%. In general, grain exports in value equivalent increased in 2022 compared to 2018 by 1,871.9 million USD. A significant increase is observed in the export of fats and oils of animal and vegetable origin. In 2018, the share of this group of products in the structure of exports of agricultural products was 13.7% and increased to 14.6% in 2022, that is, it increased by 1,452.9 million USD over the period under study. Cereal crops constitute the largest specific weight in the structure of domestic export of agricultural products. In 2018, the specific weight of grain exports in the structure of exports of products of the agro-industrial complex amounted to more than 22%, and in 2021 it increased to 25.5%. Export revenue from the sale of grain crops increased in 2022 by \$1,871.9 million compared to 2018.

Another group of agricultural products, namely fats and oils of animal and vegetable origin, also saw significant growth. The share of this group of products in the structure of exports of products of the agro-industrial

complex was 13.7% in 2018 and reached 14.6% in 2022. Thus, cash receipts from the export of this group of goods increased by \$1,452.9 million over the period under study.

Table 4. Structure of Ukrainian exports of agricultural products and food industry, 2018-2022

The code and name of goods according to the Ukrainian classification of goods of foreign economic activity	2018		2019		2020		2021		2022		Deviation, 2022 to 2018, +/-	
	million USD	share, %	million USD	share, %	million USD	share, %	million USD	share, %	million USD	share, %	million USD	share, %
grain crops	7,240.6	22.1	9,633.3	24.4	9,410.7	24.4	12,343.8	25.5	9,112.5	22.3	1,871.9	0.2
fats and oils of animal or vegetable origin	4,496.5	13.7	4,732.2	12.0	5,746.9	14.9	7,037.2	14.5	5,949.4	14.6	1,452.9	0.9
seeds and fruits of oil plants	1,954.1	6.0	2,563.2	6.5	1,842.4	4.8	2,435.2	5.0	3,758.8	9.2	1,804.7	3.2
food industry residues and waste	1,224.8	3.7	1,486.2	3.8	1,576.5	4.1	1,733.1	3.6	1,082.0	2.6	-142.8	-1.1
meat and edible offal	646.0	2.0	711.9	1.8	652.1	1.7	845.6	1.7	923.9	2.3	277.9	0.3
milk and dairy products, poultry eggs; natural honey	480.9	1.5	453.9	1.1	426.5	1.1	378.5	0.8	452.5	1.1	-28.4	-0.4
edible fruits and nuts	228.6	0.7	260.1	0.7	238.4	0.6	368.2	0.8	313.1	0.8	84.5	0.1
vegetables	235.7	0.7	184.5	0.5	168.1	0.4	196.6	0.4	102.7	0.3	-133	-0.4
finished grain products	268.3	0.8	269.4	0.7	313.1	0.8	414.6	0.9	251.8	0.6	-16.5	-0.2
sugar and sugar confectionery	366.9	1.1	254.4	0.6	250.3	0.6	246.5	0.5	299.6	0.7	-67.3	-0.4
tobacco and industrial tobacco substitutes	398.7	1.2	437.6	1.1	441.3	1.1	453.0	0.9	138.7	0.3	-260	-0.9
other goods and products of the agriculture and food industry	15,186.0	46.5	18,569.4	46.9	17,545.5	45.4	21,928.3	45.3	18,460.1	45.2	3,274.1	-1.3
Total agro-industrial complex	32,727.1	100.0	39,556.1	100.0	38,611.8	100.0	48,380.6	100.0	40,845.1	100.0	8,118.0	-

Source: calculated by the authors based on [30].

A dynamic increase in the export of seeds and fruits of oil crops in 2022 compared to 2018. In 2022, the export of seeds and fruits of oil crops increased compared to 2018 by 1,804 million USD, i.e. by 3.2 percentage points. 2022 turned out to be very difficult for Ukraine and for the world as a whole. The hostilities in the region blocked the main logistics flows of the export of products from Ukraine and significant changes in the export structure have appeared regarding the geographical dispersion of the beneficiaries. Transport logistics became much more complicated – 55% fewer products were exported by sea transport in 2022 than in 2021. On the other hand, the share of transportation by road transport has increased significantly. In 2022, the total tonnage of goods exported by road transport increased by 32.4% compared to 2021.

The exports of agricultural products, which usually were carried out by sea, since 2022 were transported on the expense of the use of road, rail, and river, which led to a reduction of the volume of transported products. One cargo ship is capable of moving such a quantity of cargo that would require, for example, about 3,600 trucks or 40 river barges. In 2022, 60% of grain exports were carried out by river transport, 26% by rail, and 4% by road transport. Exports were carried out by rail to the ports of Poland and Lithuania, as well as through Austria. The use of railway transport, let alone road transport, turned out to be inefficient from an economic point of view. European sea terminals have not enough capacity to export additional amounts of products like the ones coming from Ukraine.

Before 2022, the Ukrainian export volume was 60 million tons. In 2021, 8.2 million tons of grains were exported through the Polish ports: Gdansk, Gdynia, Szczecin. But, starting from March 2022, about 25 million tons of grains were exported through Constanta port [31].

Since August 2022, more than 1.7 million tons of agricultural products were exported from the ports of Odesa, Chornomorsk, and Pivdennyi, after the opening of the "Grain corridor".

According to State Statistics Service of Ukraine, a total of 68 ships left the unlocked ports during August, the ports of destination of which are located in 18 countries of the world. During the same period, almost 1.6 million tons were exported through the Danube ports, about a million tons by rail, and more than 600 thousand tons by road [30].

As a result, in March 2022 331.6 thousand tons of agricultural products were exported, then in April – 1.2 million tons, and in June – more than 2.7 million tons, and 3 million tons in July 2022. At the same time, this is significantly less than the 5-6 million tons that were exported monthly by the Black Sea ports before 2022. In general, before the opening of Odesa ports, as of August 1, 2022, almost 8 million tons of agricultural products were shipped, while in 2021, the figure for March-July was more than twice as large – 19.5 million tons. With the start of the implementation of the “grain initiative”, the monthly export of agricultural products increased significantly. In total, in August, Ukraine exported 4.6 million tons of agricultural products, in October and September – 6.9 million tons, and in November – 7.2 million tons [30].

The results of the research made by the Ministry of Agrarian Policy and Food of Ukraine, together with the Kyiv School of Economics, indicated that the total amount of indirect losses in the agricultural sector of Ukraine during the period March-October 2022 amounted to 34.25 billion USD. More than 50% of this amount is due to the losses of producers due to the disruption of logistics flows [13].

In general, we can note the consolidation of the world community around Ukraine's problems, particularly its economic component. For example, the EU cancelled all customs restrictions on the export of goods and services from Ukraine, which were stipulated by the agreement on the free trade zone. The world community demonstrated unity in solving problems, in particular, economic and logistical ones, which arose as a result of the financial crisis in Ukraine. In particular, the EU canceled customs restrictions and quotas on the export of agricultural products from Ukraine in 2022 and extended this norm until 2023.

Despite the losses of agriculture in 11 months in 2022, Ukraine exported 50.9 million tons of agricultural and food industry products for a total amount of 21.1 billion dollars. In terms of volume, this is by 16.7% less, and in value by 13.7% less than in 11 months of last year [30].

According to Ministry of Agrarian Policy and Food of Ukraine about 7.6 million hectares of arable land have been withdrawn from circulation for an indefinite period. In 2023, the projected cultivated area with grain crops in Ukraine is 8.7 million hectares [13].

In our study, we established the forecast for the year 2023 regarding the gross harvest, based on the sown areas of cereals, and also the forecast of the yield using extrapolation through the construction of a trend line. In the process of calculations, polynomial approximation was used to form the trend line, because the quality of the trend line is the highest – the  $R^2$  coefficient is 0.8717.

The forecasted yield in 2023 is determined at the level of 5.2 tons/ha

In 2023, a decrease in grain yield in Ukraine is expected due to a number of objective reasons. The economic crisis provoked by hostilities significantly narrows the financial possibilities of farmers directly and the state in terms of their support as a whole. We expect a decrease in the amount of fertilizer application, the use of plant protection products, and a violation of the technological process, which will definitely affect an even greater decrease in the yield of grain and other crops.



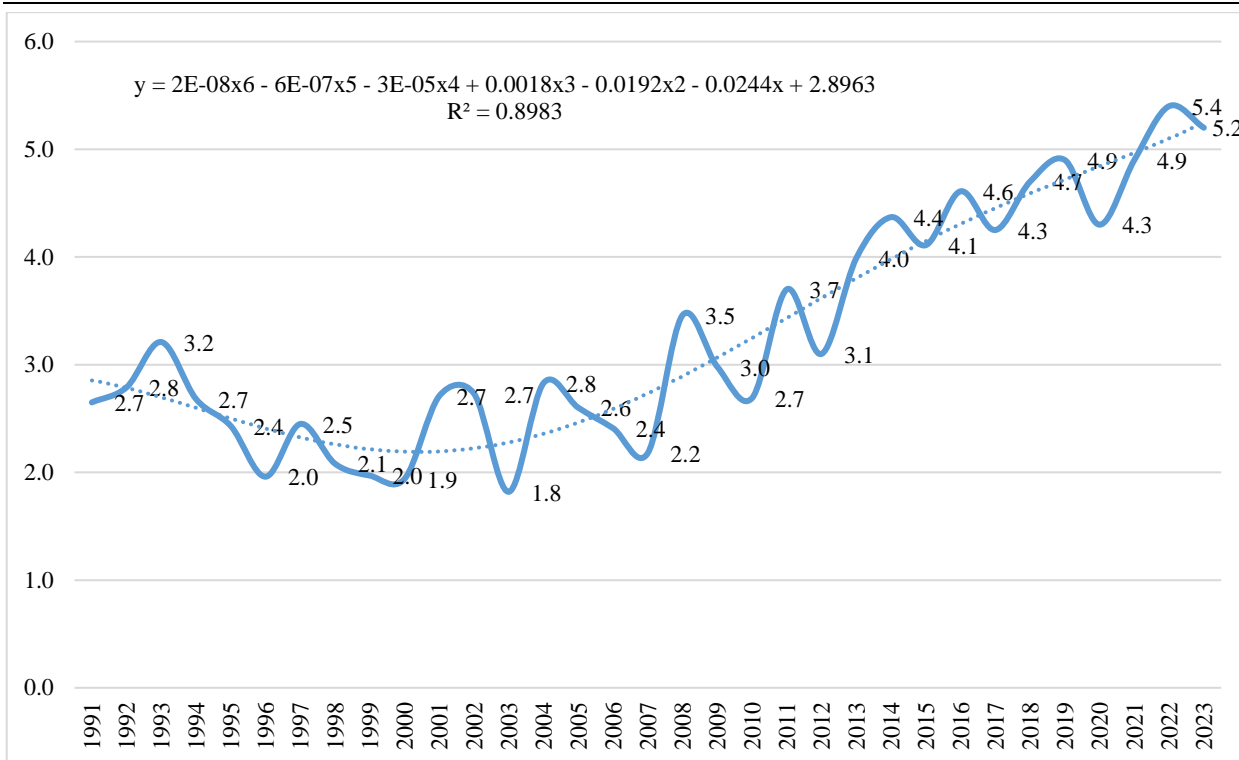


Fig. 5. Forecast of the yield of grains in Ukraine for 2023, tons/ha  
 Source: calculated by the authors.

The expected reduction in the yield of grain crops as a result of the action of the above-listed reasons relative to the forecast indicator for 2023 may amount to 10-20%. Thus, the average yield of grain crops in Ukraine in 2023 can be predicted at the level of 4.4 t/ha. The factors listed above will have a negative impact on the yield of grain crops, which may cause it to decrease by an additional 10-20% relative to the forecasted indicator in 2023. We believe that the expected yield of grain crops in Ukraine in 2023 will be 4.4 tons on average /Ha.

Taking into account the forecasted amount of acreage under grain crops in Ukraine in 2023 in the amount of 8.7 million hectares, and productivity – 4.4 tons/ha, the expected gross harvest of grain crops will be about 38.1 million tons, which is 55% less than the similar indicator of the pre-war year 2021.

Traditionally, in Ukraine, the lion's share of the gross harvest of grain went for export, while the share of the harvest needed for domestic needs did not exceed 36% over the last 5 seasons, including on average, food consumption accounted for only about 6%, fodder - 18% [30].

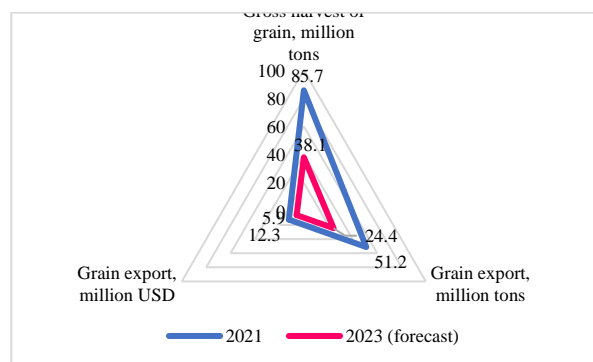


Fig. 6. Projected losses of Ukraine from the export of grain crops  
 Source: [30].

Based on this statement, we can assume that in 2023, Ukraine will use 13.7 million tons of grain for domestic consumption, while it can export about 24.4 million tons, which is 53.2% less than a similar indicator in 2021 (Fig. 6).

## CONCLUSIONS

The above provides grounds for asserting that the agricultural sector is extremely important for the Ukrainian economy as a whole. The agrarian branch of the economy is entrusted

with the strategic mission of ensuring the country's food security. As an economic component of the national economy, the agrarian sphere actively forms added value, provides work for the rural population, which contributes to the development of the countryside, loads adjacent branches of production, trade, etc. with orders. Surplus production of agricultural products over domestic demand creates the export potential of domestic agricultural products. High quality and balanced prices make Ukrainian agricultural products highly competitive not only in domestic but also in foreign markets. As a result of the export of agricultural products, Ukraine receives significant foreign exchange earnings, which allows it to balance the foreign exchange market and provides producers with cash to finance economic activities.

The risks that arose in 2022 left a heavy mark on the agricultural sector. The loss of export capacities, a significant reduction in cultivated areas, expensive logistics, and price disparity significantly deepened the economic crisis of the industry. In order to ensure the production of the number of agricultural products necessary for domestic consumption and export, the state needs to take a number of measures, in particular, to provide farmers with the necessary financial support for the proper completion of the production season of the current year, to make efforts to establish effective and uninterrupted logistics for the export of agricultural products, to provide domestic farmers with the necessary political support in the markets of partner countries.

To ensure the required amount of agricultural products for domestic consumption and export, the state should take certain measures. Among them is the provision of necessary financial support to farmers so that they can successfully complete the production season of the current year. It is also necessary to pay due attention to the creation of effective and uninterrupted logistics for the export of agricultural products, as well as to provide political support to domestic farmers in the markets of partner countries. These measures will contribute to the stability and

development of the agricultural sector in Ukraine, which is key to ensuring the country's food security and increasing export potential.

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