

GRAIN COMPLEX OF KAZAKHSTAN ON THE EXAMPLE OF GRAIN-GROWING REGIONS

АСТЫҚ ЕГЕТІН ӨҢІРЛЕР МЫСАЛЫНДА ҚАЗАҚСТАННЫҢ АСТЫҚ КЕШЕНІ

ЗЕРНОВОЙ КОМПЛЕКС КАЗАХСТАНА НА ПРИМЕРЕ ЗЕРНОСЕЮЩИХ РЕГИОНОВ

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Abstract. *The goal* is an economic assessment of the development of grain market using the example of grain-growing regions of Kazakhstan and development of recommendations. *Methods* – bibliometric, comparative, graphical, statistical, generalization and system analysis. *Results* – it has been determined that in the unstable conditions of the development of the world economy, production and access to grain products become important to ensure food security; a thematic review of literature sources on the efficiency of growing grain crops was made, where the authors focus on government support for farmers, the use of digital technologies, increasing yields, and achieving the competitiveness of agricultural producers. Factors affecting the collection and export of grain in the republic have been identified. A ranking of the influx of investment in agriculture in the regional context of the country was carried out. The socio-economic indicators of the development of the real sector of economy of the Kostanay, North Kazakhstan and Akmola regions, which have the most significant grain potential, are considered. Indicators of grain production in this region over the past 10 years have been analyzed in dynamics. The level of change in the main parameters affecting the volume of gross grain harvest was calculated using the example of regional grain farms. The reasons for the negative deviation and positive trend in production of grain crops in Kazakhstan's grain-growing regions have been identified. Directions for increasing efficiency, competitiveness and grain exports are proposed. *Conclusions* – the

existence of favorable conditions at the regional level for grain industry is substantiated on the basis of state subsidies for the construction of transport infrastructure, the influx of foreign investors, digitalization and introduction of innovations in the agro-industrial complex. It is necessary to reduce high infrastructure and logistics costs, increase the level of exchange trading, and increase investment.

Аңдатпа. *Мақсаты* – Қазақстанның астық егетін өңірлерінің мысалында астық нарығының дамуын экономикалық бағалау және ұсынымдар әзірлеу. *Әдістері* – библиометриялық, салыстырмалы, графикалық, статистикалық, жалпылау және жүйелік талдау. *Нәтижелері* – азық-түлік қауіпсіздігін қамтамасыз ету үшін әлемдік экономиканы дамытудың тұрақсыз жағдайларында астық өнімін өндіру мен оған қол жеткізудің маңызы зор екені анықталған; дәнді дақылдарды өсірудің тиімділігі бойынша әдеби дереккөздерге тақырыптық шолу жасалған, онда авторлар фермерлерді мемлекеттік қолдауға, цифрлық технологияларды пайдалануға, өнімділіктің өсуіне, ауыл шаруашылығы тауарын өндірушілердің бәсекеге қабілеттілігіне қол жеткізуге баса назар аударған. Республикада астық жинауға және экспорттауға әсер ететін факторлар анықталған. Елдің өңірлік бөлінісінде ауыл шаруашылығы саласына инвестициялар ағынын саралау жүргізілген. Қостанай, Солтүстік Қазақстан және Ақмола облыстары экономикасының нақты секторын дамытудың неғұрлым көп сатып алынатын астық әлеуеті бар әлеуметтік-экономикалық көрсеткіштері қаралған. Соңғы 10 жылдағы осы өңірдегі астық өндірісінің индикаторлары динамикада талданған. Облыстардың астық шаруашылықтарының мысалында жалпы астық жинау көлеміне әсер ететін негізгі параметрлердің өзгеру деңгейі есептелген. Қазақстандық астық егетін аудандарда астық дақылдарын өндірудің теріс ауытқуының және оң үрдісінің себептері анықталған. Дәнді дақылдардың өнімділігін, бәсекеге қабілеттілігін және экспортын арттыру бағыттары ұсынылған. *Қорытындылар* – көлік инфрақұрылымын салу, шетелдік инвесторлар ағыны, цифрландыру және АӨК инновацияларын енгізу бойынша мемлекеттік субсидиялау негізінде астық саласы үшін өңірлер деңгейінде қолайлы жағдайлардың болуы негізделген. Жоғары инфрақұрылымдық және логистикалық шығындарды қысқарту, биржалық сауданың деңгейін арттыру, инвестициялауды ұлғайту қажет.

Аннотация. *Цель* – экономическая оценка развития зернового рынка на примере зерносеющих регионов Казахстана и разработка рекомендаций. *Методы* – библиометрический, сравнительный, графический, статистический, обобщения и системного анализа. *Результаты* – установлено, что в неустойчивых условиях развития мировой экономики для обеспечения продовольственной безопасности важное значение приобретает производство и доступ к зерновой продукции; сделан тематический обзор литературных источников по эффективности выращивания зерновых культур, где авторы акцентируют внимание на государственной поддержке фермеров, использовании цифровых технологий, росте урожайности, достижении конкурентоспособности сельхозтоваропроизводителей. Определены факторы, воздействующие на сбор и экспорт зерновых в республике. Проведено ранжирование притока инвестиций в сферу сельского хозяйства в региональном разрезе страны. Рассмотрены социально-экономические показатели развития реального сектора экономики Костанайской, Северо-Казахстанской и Акмолинской областей, имеющие наиболее купный зерновой потенциал. Проанализированы в динамике индикаторы производства зерна в данном регионе за последние 10 лет. Рассчитан уровень изменения основных параметров, воздействующих на объемы валового сбора зерна на примере зерновых хозяйств областей. Выявлены причины отрицательного отклонения и положительной тенденции производства зерновых культур в казахстанских зерносеющих районах. Предложены направления повышения результативности, конкурентоспособности и экспорта зерновых. *Выводы* – обосновано наличие благоприятных условий на уровне регионов для зерновой отрасли на базе государственного субсидирования по строительству транспортной инфраструктуры, притока зарубежных инвесторов, цифровизации и внедрения инноваций в АПК. Необходимо сократить высокие инфраструктурные и логистические издержки, повысить уровень биржевой торговли, увеличить инвестирование.

Key words: agro-industrial complex, grain, grain-growing regions, innovation, logistics, transport infrastructure, investors, government support, food security.

Түйінді сөздер: агроөнеркәсіптік кешен, астық, астық егетін өңірлер, инновациялар, логистика, көлік инфрақұрылымы, инвесторлар, мемлекеттік қолдау, азық-түлік қауіпсіздігі.

to significantly curb the production of grain crops. Many farmers, in order to reduce their costs, began to switch to more profitable non-grain production. This situation leads to a threat to food security in terms of reducing domestic grain production. In this regard, scientists propose to strengthen control by local governments to strengthen the focus on the local harvest of grain crops [6].

Agricultural productivity with the use of new digital technologies can lead to a reduction in emissions (CO₂). In Buckler's view, many growers in the European Union and the US are neglecting the application of innovation in row crops and cereals. Farmers save their costs on innovation. It is emphasized that the Government, on the basis of subsidizing the costs of agricultural companies, should contribute to the reduction of negative emissions [7]. To calculate the level of international competitiveness, foreign scientists Wang, Huang et al used such indices as: comparative advantages, international market share and degree of trade competitiveness. In addition, on the basis of the gravity model, the factors influencing the international grain trade were presented and evaluated. The findings of the study demonstrated the low share of Kazakhstan's presence in the global grain market. True, it is objectively noted that wheat has good quality characteristics, therefore it can successfully compete in the international space [1k.2].

Soliani's work is focused on the study of logistics for the delivery of agricultural products within and outside the country. It is determined here that a country can have high profitability if there is an optimization of transport logistics for the delivery of grain. It has been proven that in order to get a good profit, grain must be delivered by rail or sea. Therefore, the state itself should participate in this process and attract more foreign investors in the construction of transport infrastructure [8].

According to a group of foreign authors, climate change around the world adversely affects the quality of the land fund, the nutritional value of cereals, productivity, etc. [9]. Another article reveals aspects of the impact of harmful emissions, considering the production of agricultural products, including cereals. The authors concluded, using mathematical optimization and forecasting models - LCA and ARIMA, that it is necessary to achieve a reduction in harmful emissions based on the introduction of innovations in the agricultural production process [10].

The past pandemic has significantly affected the food system around the world.

A survey of 768 respondents in India, Egypt, Nigeria and other African and Asian countries was conducted to assess the impact of the pandemic and the cost of resources on food. The survey findings showed that in the period 2020-2021 the production of agricultural products, including grain crops, was seriously disrupted. To support agriculture, government measures to subsidize farmers are needed [11].

During the pandemic, there were limits and restrictions for all states. Many households that were engaged in agriculture began to have production and social risks. Therefore, the role of the Government in supporting agricultural producers to protect farmers is substantiated here [12]. Kazakh scientists believe that a slight decline in grain exports over the past three years can be explained by the presence of a pandemic, border closures, disruption of logistics, higher prices for agricultural equipment, seeds, fuels and lubricants, mineral fertilizers, etc. [13].

Despite some improvements, in 2023 the global economy continues to see dangerous weakening in economic activity. In particular, according to the World Bank research, it is expected that in 2023. the increase in the global economy will be approximately 2.1% (while in 2022 - 3.1%) [14]. Such a decline in economic growth, in our opinion, can be explained by a rather high increase in interest rates and the cost of energy resources.

Against the backdrop of the aggravation of world political conflicts, climate cataclysms, economic recession, urbanization, there is a decrease in food security and an increase in hunger of the population. In recent years, the effects of climate change have seriously affected the development of food systems. This leads to hunger and a decline in the range of diets in poor countries [1k.9].

At the end of 2022 the value of Kazakhstan's gross agricultural output is 9.3 trillion. tenge. Over the past 10 years, farmers of the republic have harvested a high crop of grain crops at the level of 22.8 million tons [15]. Including wheat harvest in 2022 amounted to almost 17 million tons (in relation to 2021 increased by 44%).

From our point of view, the factors that influenced the grain harvest are comfortable weather conditions, government measures to allocate funding for agricultural producers, fuels and lubricants, fertilizers, and seeds. In addition, an important role was played by the influx of investments in this industry in the amount of 855.7 billion tenge. That is, growth in relation to 2021 in the fixed capital of agriculture increased by approximately 7%. Par-

ticularly in 2022 - 267 new investment projects were implemented for a total amount of over 241.3 billion tenge.

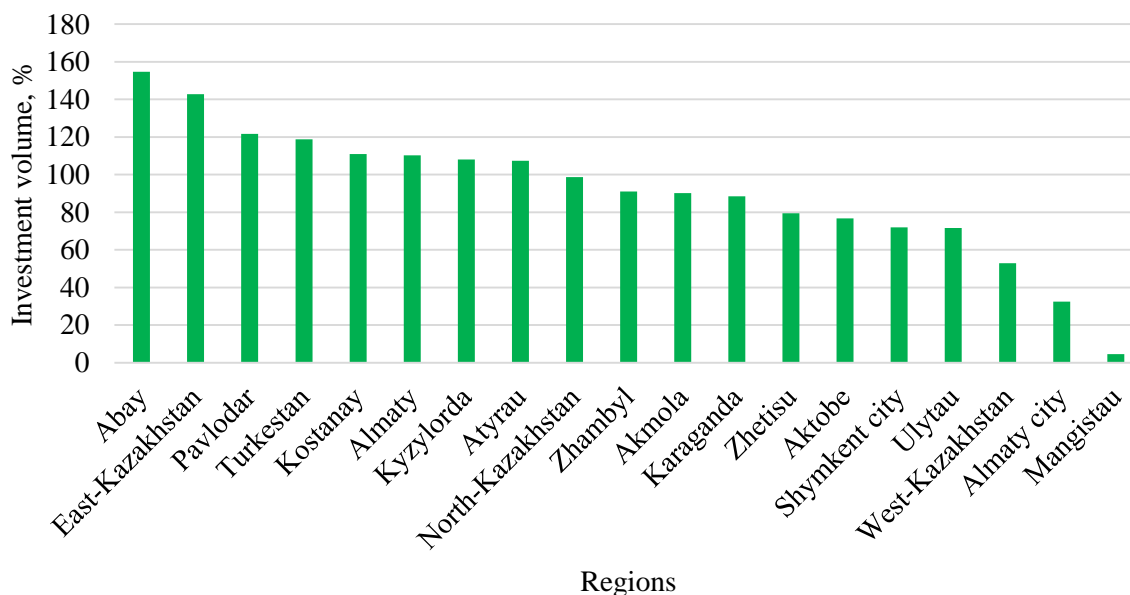
According to estimates, in the country for 5 months of 2023 the growth of foreign trade turnover by 8% (equivalently within 56 billion dollars) was demonstrated. At the same time, the export of Kazakhstan's products is 31.6 billion dollars. Accordingly, there is a positive trade balance of the republic at the level of 7.4 billion dollars [16]. For example, for the whole of 2022 foreign trade turnover increased by 33.4%, which is 122.2 billion in dollar terms [17].

Grain is one of the main objects of foreign economic trade relations. Considering certain difficulties in the framework of Russia's special operation in Ukraine, the export of wheat and flour for the period of the 2022-2023 season is expected, according to our forecasts, at

the level of about 9 million tons. While in 2022 more than 13 million tons of flour and grain were exported [18].

Currently, agricultural companies in 13 regions produce wheat in the republic. Favorable weather conditions and a well-developed production base make it possible to ensure good grain yields in the northern regions. The largest here are three grain-growing regions - Kostanay (about 31%), North Kazakhstan (about 29%) and Akmola (about 20%) regions. It should be noted that the total share of grain production in the noted 3 regions is over 80%.

The total amount of investments in fixed capital of agriculture by region in 2022 is equal to 853.5 billion tenge (figure). This is almost 7 percent higher than in 2021.



Note: compiled from source [19]

Figure - Index of the physical amount of investment by region in the fixed capital of agriculture, 2022

Figure shows the physical volume of investments by regions in the fixed capital of agriculture in 2022. It can be seen here that the 3 main grain-growing regions attracted more than 357.2 billion tenge, or more than 40% of the total investment in agriculture of the republic. Consider the socio-economic indicators of three large grain-growing regions of Kazakhstan.

The North Kazakhstan region has a powerful territorial and industrial potential for the development of the agro-industrial complex. The total territory of the region is 98,0 km² (this is about 4% of the entire territory of Kazakhstan). This area borders on Russia,

which implies quite favorable transport and logistics conditions.

The share of the region in the total volume of the gross agricultural product of the Republic of Kazakhstan is approximately 14%. Including the agricultural sector accounts for 31% of gross rating point (GRP). The specialization of the region is connected with the sowing of grain crops. Almost every year, this region exports over 1 million tons of grain.

In order to develop investment attractiveness, the Regional Administration prepared a regional pool (900 billion tenge). This pool consists of 53 investment projects of the agro-industrial complex, which will be implemented until 2024.

Akmola region is located in the border zone and has extensive foreign economic relations with the developed regions of Russia: Tyumen, Omsk and Novosibirsk regions. Among the regions in terms of total GRP, Akmola region is in 11th place (more than 3% of Kazakhstan's GDP).

In terms of natural and climatic conditions, the marked area differs significantly from neighboring regions. Here, its climate is affected by the heterogeneous relief of Saryarka - this is the Kazakh hillock. In the center of this region is the capital of the country - Astana, where suburban agriculture is actively developing.

The main element of the agricultural production of the region is rainfed grain cultivation (more than 20% of the total mass of republican production). The production of spring wheat prevails here, occupying over 70% of the total sown area of the region. The quality of grain produced in the region corresponds to the 3rd class.

In recent years, Akmola region has been producing more than 1.5 million tons of grain for export. Large grain-sowing companies of the region are: «Atbasarskaya Niva» LLP, «Ishim Astyk» LLP, «Baumanskoye» LLP, etc.

The next Northern region - Kostanay region occupies a fairly convenient geographical position, considering the proximity to Russia. Let's single out for 2021-2022 investments in the amount of 306.2 billion tenge were attracted to the regional economy (an increase of 11%).

This area is rightfully considered one of the largest grain-producing regions of the country. In particular, the share of agriculture in GRP exceeds 34% on average. And the total share in the republican is over 17%. The basic basis of agricultural production is grain farming. The agricultural sector is the second direction of the region's economy. The total area of agricultural crops in the Kostanay region was approximately 4.9 million hectares in 2022 and 2023. At the same time, for grain crops, the sowing volume amounted to over 4 million hectares. For example, for the development of the agro-industrial complex of Kostanay region, the state allocated for 2022 - 113.6 billion tenge.

State funding was provided to subsidize the sowing campaign of farmers (more than 45 billion tenge), the purchase of agricultural machinery, seeds, fuels and lubricants, etc. [20]. From the beginning of 2023 the government allocated 58.5 billion tenge for the organization of the agro-industrial complex of the Kostanay region. JSC «Agrarian Credit

Corporation» provided farmers with loans totaling almost 35 billion tenge [21].

Let's carry out a comparative economic assessment of grain production in three large grain-growing regions of Kazakhstan. Based on the results of the comparative analysis, it can be seen that a negative deviation by 2022 in relation to 2013 was recorded in terms of indicators: yield and gross grain harvest. Other indicators, such as the area under crops, the total number of agricultural companies and investments in agriculture, show positive dynamics.

Let's try to determine the reasons for the negative development of grain production in the noted regions. Objectively, it is worth emphasizing that some fluctuation in grain yield over the years is associated with unstable weather conditions and uneven rainfall in the North of the republic. In addition, there are often risks of sudden onset of frost. Due to the sharp autumn cooling, grain growers do not have time to harvest the crop.

An important emphasis should be placed on the instability of prices in the grain market, which sharply reduce demand. In particular, Russia's military operation in Ukraine and the imposition of anti-Russian sanctions led to a significant flow of Russian grain. Thus, Russia began to offer more of its grain to traditional international markets, where Kazakh wheat previously had a higher priority. High supply from Russian grain contributed to lower prices. Therefore, Kazakh farmers began to receive less profitability and profit from grain exports.

At the beginning of 2023 According to the Ministry of Agriculture, agricultural producers have up to 160,0 units. tractors, about 80,0 units seeders, over 5 000 units. various sowing machines [22]. True, in our opinion, in the machine and tractor fleet there is a serious deterioration of agricultural equipment. In general, wear and tear in the republic is over 60-70%, which seriously leads to a decline in productivity [Ik.13].

In order to improve the quality of grain, productivity, productivity and profitability of production, the introduction of innovations and agricultural technologies is urgently required. Successfully applying a digital approach, agrodrones, electronic navigation, you can make timely decisions to optimize the costs of grain growers. In turn, this will seriously increase the yield, production volume and export potential of grain crops [23].

The decline in grain production and exports was affected by high transport tariffs, reduced throughput, old infrastructure and a

shortage of grain carriers. At the same time, the pandemic of 2020 and 2021 exacerbated the situation due to the introduction of lockdowns and border closures.

However, from 2022 the situation began to improve. For example, first of all, there were good deliveries of our grain and flour to the Republic of Uzbekistan within the framework of about 4 million tons, as well as to China, Iran and other countries.

From our point of view, the following can be attributed to the positive growth factors of grain cultivation. Obviously, the three large regions have significant land resources, as evidenced by the high level of agricultural potential.

Indeed, over the past 10 years, some modernization of agricultural technology has been implemented in these grain-sowing regions, there has been an increase in sown areas, financing of sowing and harvesting campaigns has been carried out at the expense of State programs and the National Project for the Development of the Agro-Industrial Complex of the Republic of Kazakhstan for 2021 - 2025, etc.

As a result, in our opinion, we can talk about some positive dynamics in the yield, production and export of grain over the 10 years under study in the three northern large grain regions of the country.

In the bulk, Kazakh grain has a rather high protein - over 15%, and gluten indicators are more than 30%. This characterizes the good quality indicators of grain crops. We believe that it is necessary to increase the stable rate of production of high-quality wheat. So, in the bulk of wheat production, class 3 prevails. And to increase world demand for domestic wheat, the quality should be brought to the level of 1-2 classes. To do this, it is necessary to apply a sufficient amount of fertilizers annually, carry out plant protection control, ensure timely irrigation, use digital technologies to monitor agricultural fields, etc.

In our opinion, today the issues of material support for the renewal and modernization of the agricultural park, state financing for the purchase of elite seeds, preferential lending for the sowing and harvesting campaigns need to be promptly addressed. Here, first of all, we are talking about timely deliveries of fuels and lubricants, spare parts, herbicides, etc.

At present, in the framework of the global competition for investments, great emphasis should be placed on attracting strategic investors. Yes, indeed, an increase in investment in the country's fixed capital in 2022 approached 13%. It should be noted that the attraction of

investments increased in agriculture - by 22.1%. However, it should be noted that these investments are still not enough to ensure the goals of sustainable development of Kazakhstan and the growth of the real sector.

Regionally for the 1st half of 2023 an increase in production is observed: in Akmola and Kostanay regions, primarily due to the growth of the agro-industrial complex. True, the inflow of investment resources, including the agricultural sector, has decreased in the North Kazakhstan region [Ik.16].

In order to ensure a favorable grain harvesting campaign, it is necessary to exclude idle times for farmers, the state provides such support measures as: a program of preferential agricultural lending for machinery and equipment, leasing of agricultural equipment and subsidizing agricultural industries.

Here it is worth highlighting that the lending of commercial banks to representatives of farms and Agro institutions is very low. Currently, the share of lending to agricultural companies is less than 5% of the total. In this regard, the state appears to be the only source of obtaining material resources. In particular, seasonal activities of grain growers are financed through the JSC «Agrarian Credit Corporation».

The following factors appear to be important general threats and shortcomings in the production and sale of grain for export in Kazakhstan. For example, there are problems when transporting grain to foreign countries. These include: a lack of grain-carrying wagons, a weak level of locomotive traction, rising prices for railway wagons and tariffs, downtime, low speed of unloading wagons.

It should be objectively said that the growth of transport tariffs is also affected by the increased level of inflation both in the world and in our country. This leads to a decrease in competitiveness and a drop in the profitability of agricultural producers.

An important threat is the global decline in grain prices. On this basis, there is a decrease in the profitability of wheat production. Especially, the import of cheap wheat from Russia is of great concern. There was an increase in prices for material resources: mineral fertilizers, elite seeds, spare parts, agricultural equipment.

The problems of grain growers are aggravated by non-observance of crop rotations. The lack of amorphous, herbicides and nitrogen in the soil leads to a decrease in the nutritional value of the earth. The growth of plant diseases leads to the destruction of the future crop.

There is a rather low wheat yield compared to Russia. This directly affects the reduction in prices for Russian grain. Therefore, Kazakh grain growers receive less profit.

High interest rates and a lack of working capital among farmers lead to a decrease in the introduction of innovations, new digital technologies, the purchase of quality seeds, and the application of sufficient fertilizers.

In the context of the global economic downturn, the tightening of lending measures in the world, the continuation of inflationary expectations (especially in the food market), the decline in the economic development of poor countries, the increased risk of the population to access agricultural products and food, from our point of view, it is necessary to take such measures in the grain sector.

To solve problems with logistics, it is necessary to expand and build a new transport infrastructure. First of all, attention should be paid to the construction and expansion of port infrastructure in Georgia. We are talking about a grain terminal in the city of Poti. In the future, this will give our republic a stable yield of grain exports by the Black Sea up to 1.5 million tons per year. Note that the sea route is much cheaper than other modes of transport.

To improve state support for the grain market, we propose following measures.

In our opinion, the Government should introduce subsidies for the transportation of grain according to the successful experience of Russia. For example, the Russians, in order to sell their surplus crops in certain Siberian regions, introduce subsidies for rail transport to seaports. And there, further, the grain is already distributed by sea for export. This experience would help our republic to increase the number of grain shipments to Azerbaijan, Turkey and other countries.

Our state should stimulate the modernization and construction of innovative elevators and grain storage facilities, help to buy new locomotives and grain carriers.

From our point of view, the state should pay much attention to the regime of inflow of foreign and domestic investments. This will provide significant support to local grain producers and flour processors.

We believe that today it is worth paying significant attention to the use of digital agricultural technologies in grain production. In particular, agricultural formations should initiate the process of purchasing agricultural drones for flying over agricultural fields, introduce a precision farming system to properly irrigate crops, apply computer technologies based on the analysis of a large array of agri-

cultural data, etc.

Therefore, the use of innovative approaches will mitigate the effects of food crises. At the same time, the use of digitalization and innovation will have a positive impact on the positive development of the agro-industrial complex, including the grain market.

Conclusions

1. Grain production is the main food commodity on a global scale. Kazakhstan appears to be one of the main producers and exporters of grain at the world level. At the same time, wheat is the main agricultural crop. So, according to the results of 2022 for the first time in history, the republic sold 13.2 million tons of flour and grain for export. This was facilitated by such factors: favorable climate and precipitation, inflow of investments, distribution of state resources for the purchase of high-quality seeds, diesel fuel by farmers, etc.

2. At the level of the study, we found that more than 80% of the grain crop falls on the 3 largest grain-growing regions - Akmola, North Kazakhstan and Kostanay regions. A comparative analysis of these areas showed negative trends in terms of insufficient growth in the volume and yield of grain. At the same time, positive trends in the production of grain crops have been identified: an increase in investment, acreage and agricultural formations.

3. Anti-Russian sanctions reduce farmers' incomes and complicate the export of domestic grain due to disruption of logistics routes, volatility in wheat prices, shortages and downtime of grain carriers, the use of outdated agricultural equipment, and a decrease in the inflow of foreign capital into the agro-industrial complex.

4. Prospects for the formation of the Kazakh grain market include such recommendations. It is necessary to expand state financing of agricultural companies for the purchase of agricultural machinery, fuel, herbicides, and elite seeds. An important emphasis should be given to the introduction of digitalization, the construction of grain warehouses, transport, port and maritime infrastructure to address the logistics of delivering grain for export.

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