IRSTI 06.71.07 https://doi.org/10.26577/be202515119

G.K. Abdigul [1], A.M. Balkibayeva [2*], G.A. Assanova [3], D.M. Iskakova [4]

[1] S. Seifullin Kazakh Agro Technical Research University, Astana, Kazakhstan
[2] Academy of Physical Education and Mass Sports, Astana, Kazakhstan
[3] Auyl Party Republican Public Association, Astana, Kazakhstan
[4] Scientific and Production Enterprise "Innovator" LLP, Astana, Kazakhstan
*e-mail: ambal1974@mail.ru

MODERN TRENDS IN KAZAKHSTAN AGRICULTURE IN THE CONTEXT OF INTEGRATION TO THE WORLD ECONOMY

The threats of financial crisis, social tension, political instability, as well as the danger of a humanitarian catastrophe are common to the entire world community, but they have a particularly strong impact on developing countries. The purpose of the article is to research current agriculture development trends in Kazakhstan in the context of the integration of the world economy and the development of guidelines for improving the state of the sector. The following general scientific methods were used in the research: the methods of analysis, synthesis and formalization; graphical methods, methods of statistical analysis, method of comparisons, analysis of dynamics and structure; method of causal and logical relationships and dependencies; SWOT analysis and minimax analysis. As a result of the research, a retrospective of the agricultural industry in Kazakhstan was considered, the climatic and geographical conditions in which it develops, as well as the degree and directions of state support were determined. The current world trends in the agricultural sector were studied and the directions of their development in Kazakhstan were determined. The research is aimed at improving the efficiency, environmental friendliness and productivity of agricultural enterprises in Kazakhstan based on a study of the initial conditions, the current state and global trends in the development of the sector.

Key words: agro-industrial sector; SWOT analysis; Kazakhstan; food marketing; sustainable development.

Г.Қ. Әбдіғұл[1], А.М. Балкибаева[2]*,
Г.А. Асанова[1], Д.М. Искакова[3]

[1] С. Сейфуллин ат. Қазақ агротехникалық зерттеу университеті, Астана, Қазақстан
[2] Дене шынықтыру және бұқаралық спорт Академиясы, Астана, Қазақстан
[3] ««Инноватор» ғылыми-өндірістік кәсіпорын» ЖШС, Астана, Қазақстан
*e-mail: ambal1974@mail.ru

Әлемдік экономикаға интеграция контексіндегі қазақстандық ауыл шаруашылығының заманауи үрдістері

Қаржылық дағдарыс, әлеуметтік шиеленіс, саяси тұрақсыздық, сондай-ақ гуманитарлық апат қаупі бүкіл әлемдік қоғамдастыққа ортақ, бірақ олар дамушы елдерге ерекше әсер етеді. Мақаланың мақсаты әлемдік экономиканың интеграциясы контексінде Қазақстандағы ауыл шаруашылығының ағымдағы даму тенденцияларын зерттеу және саланың жай-күйін жақсарту бойынша ұсынымдар әзірлеу болып табылады. Зерттеуде келесі жалпы ғылыми әдістер қолданылды: талдау, синтез және формализация әдістері; графикалық әдістер, статистикалық талдау әдістері, салыстыру әдісі, динамика мен құрылымды талдау; себеп-салдарлық және логикалық байланыстар мен тәуелділіктер әдісі; SWOT талдау және минимакс талдау. Зерттеу нәтижесінде Қазақстанның ауыл шаруашылығы саласының ретроспективасы қаралды, ол дамитын климаттық және географиялық жағдайлар, сондай-ақ мемлекеттік қолдаудың дәрежесі мен бағыттары анықталды. Аграрлық сектордағы ағымдағы әлемдік үрдістер зерделеніп, олардың Қазақстандағы Даму бағыттары айқындалды. Зерттеу саланың бастапқы жағдайларын, ағымдағы жай-күйін және жаһандық даму үрдістерін зерделеу негізінде Қазақстанның ауыл шаруашылығы кәсіпорындарының тиімділігін, экологиялылығы мен өнімділігін арттыруға бағытталған.

Түйін сөздер: агроөнеркәсіптік сектор; SWOT-талдау; Қазақстан; ауыл шаруашылық маркетинг; ауыл шаруашылығы.

Г.К. Абдигул[1], А.М. Балкибаева[2]*,
Г.А. Асанова[1], Д.М. Искакова[3]
[1] Казахский агротехнический университет имени Сакена Сейфуллина, Астана, Казахстан
[2] Академия физической культуры и массового спорта, Астана, Казахстан
[3] ТОО НПО Инноватор, Астана, Казахстан
*e-mail: ambal1974@mail.ru

Современные тенденции казахстанского сельского хозяйства в контексте интеграции в мировую экономику

Угрозы финансового кризиса, социальной напряженности, политической нестабильности, а также опасность гуманитарной катастрофы являются общими для всего мирового сообщества, но особенно сильное воздействие они оказывают на развивающиеся страны. Целью статьи является исследование текущих тенденций развития сельского хозяйства в Казахстане в контексте интеграции мировой экономики и разработка рекомендаций по улучшению состояния отрасли. В исследовании использовались следующие общенаучные методы: методы анализа, синтеза и формализации; графические методы, методы статистического анализа, метод сравнений, анализ динамики и структуры; метод причинно-следственных и логических связей и зависимостей; SWOT-анализ и минимаксный анализ. В результате проведенного исследования была рассмотрена ретроспектива сельскохозяйственной отрасли Казахстана, определены климатические и географические условия, в которых она развивается, а также степень и направления государственной поддержки. Были изучены текущие мировые тенденции в аграрном секторе и определены направления их развития в Казахстане. Исследование направлено на повышение эффективности, экологичности и продуктивности сельскохозяйственных предприятий Казахстана на основе изучения исходных условий, текущего состояния и глобальных тенденций развития отрасли.

Ключевые слова: агропромышленный сектор; SWOT-анализ; Казахстан; сельскохозяйственный маркетинг; сельское хозяйство.

Introduction

Despite being a crucial economic engine for many developing nations, Kazakhstan's agricultural sector seems to be underperforming. The latest data on the agricultural sector indicators showed the lowest GDP of 5.7% since Independence For example, GDP of Kyrgyzstan was 14.7%, 12.3% in Armenia, 11% in Moldova, 10.8% in Ukraine and 7.7% in Azerbaijan (Among the CIS countries, the indicators of Kazakhstan in terms of the weight of the agricultural sector in GDP are the weakest, 2022).

The purpose of this article is a comprehensive study of modern trends in the development of agriculture of Kazakhstan in the context of the integration of the world economy and the designing the recommendations for improving the condition of business entities employed in the sector. Accordingly, the object of the research is the agricultural sector of Kazakhstan. By delving deeper into these aspects and drawing insights from neighboring countries, Kazakhstan can unlock the true potential of its agricultural sector, propelling its economy to new heights. The methods of analysis, synthesis and formalization graphical methods, statistical analysis methods, methods of comparison, analysis of dynamics; the method of causal and logical relationships and dependencies; SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis and minimax analysis were used. The hypothesis to justify this paper was the agriculture does not advance, with no sufficient innovative technology.

Literature review

Many Kazakh and international scholars addressed the development, state and prospects of the country's agriculture, including: M. Tulegenova and N. Mejirbek (2020), D. Shejkin (2018), Y. Akhmedyarov (2019), G.R. Baytaeva and S. Dyrka (2019), A.A. Kornilova, S.E. Mamedov, Y.M. Khorovetskaya, G.A. Karabayev, T.A. Kiseleva (2018), G. Lukhmanova, K. Baisholanova, N. Shiganbayeva, B. Abenov, A. Sambetbayeva, B.S. Gussenov (2019), M. Petrick, D. Raitzer, S. Burkitbayeva (2018), J. Rustamov, C. Kirchner, J. Katto-Andrighetto (2020), A. Tokbergenova, L. Kiyassova, S. Kairova (2018), M. Uspambayeva, A. Zeinelgabdin, B. Turebekova, A. Rakayeva, A. Tulaganov, T. Taipov (2020) and others. However, the analysis of the researchers' papers allows noting the lack of an integrated approach to the existing problem. Such an approach should include an analysis of the retrospective, climatic and geographical conditions, the availability and volume of state support, statistical data for the latest period and in dynamics, a characterization of strengths and weaknesses, opportunities and threats for the country's agro-indus-

trial sector, an analysis of current world trends in the sector (sustainable development, the trend towards an increase in the share of organic agriculture, the digitalization of all economy sectors) and the study of opportunities for their stimulation in Kazakhstan, as well as the elaboration of recommendations for improving the state of agriculture.

The formation of the modern agriculture sector in Kazakhstan began in the middle of the last century from the decision of Russia to expand virgin lands in Ukraine and Central Asia. State decisions regarding the development of the sector during this period showed a twofold effect: on the one hand, there was an increase in sown areas, and on the other hand, such a policy harmed livestock breeding, reducing pasture areas. This negative effect has persisted even now (Agriculture in Kazakhstan – climate, industry development, characteristics., 2022). The current state of the agricultural sector in Kazakhstan can be characterized by the following main trends:

- Economic woes: Low labor productivity, a meager GDP share, and limited access to optimal financing and taxation schemes hamper agricultural growth.
- Resource management: Inefficient land and water use restricts potential.
- Market deficiencies: Underdeveloped domestic and export markets hinder expansion.
- Knowledge gaps: Insufficient scientific advancements, poor technology transfer, and low agribusiness expertise hold back innovation.
- Infrastructure shortcomings: Outdated equipment and limited digital adoption further exacerbate the challenges.
- Public service hurdles: Inconsistent public services and inadequate digital integration add to the burden (Uspambayeva, 2020).

Given all the above trends and problems of the sector, agriculture in Kazakhstan has a high development potential. Despite some extreme climate conditions, such as dry summers, little snow and cold winters, scarce water resources, deserts and semi-deserts, which occupy about half of the country, unique conditions have formed on the territory of the country, conducive to growing a wide range of crops and raising livestock and poultry. This is facilitated by the presence of fertile soil, two seas and mountains, and the vast territory of the country determines the diversity of climatic zones and natural conditions (Agriculture in Kazakhstan – climate, industry development, characteristics, 2022). A distinctive feature of the modern development of the AIC is the fact that agrarian transformations are carried out primarily in the regions. The economic mechanism should be built in full accordance with the macroeconomic economic mechanism, but its elements can be supplemented and detailed depending on the territorial, demographic and socio-economic specifics of the region (Tulegenova, 2020). Based on the above, it can be assumed some stagnation in the agricultural sector of Kazakhstan, as well as underutilization of the available potential due to limited funding, insufficiently effective management, and external economic, political, social factors.

Methodology

The following general scientific methods were used in the research process: the methods of analysis, synthesis and formalization were used to analyze the retrospective, climatic and geographical conditions, the availability and effectiveness of state support; graphical methods, statistical analysis methods, methods of comparison, analysis of dynamics and structure were used for the analysis of current sector development trends; the method of causal and logical relationships and dependencies was used to determine the problems and prospects of the sector; SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis and minimax analysis was used to develop recommendations and choose the best strategy. The complex nature of the study implies the presence of several interdependent stages. The following sequence was performed.

The initial stage sets the stage for our analysis, examining Kazakhstan's current agricultural landscape through its historical, climatic, and geographic realities, along with the level of state support. This establishes the basic framework and key characteristics to guide further investigation.

At the second stage, an analysis of current trends in the development of the sector in Kazakhstan was carried out, numerical characteristics were given, a study of individual indicators in dynamics was carried out and their structure in recent periods was studied. At this stage, the dynamics of such important indicators as the gross output of livestock and crop production, the increase in acreage, the number of livestock and poultry, the production of the main types of livestock products, the structure of crop production and the yield of the main agricultural crops were studied. The supposed reasons for the direction of the main trends and the formation of the structure are given, and assumptions were made for their improvement and optimization. Data was collected from national statistic base and using Excel software processed to design graphs.

The third stage is represented by a SWOT analysis of agriculture in Kazakhstan, as a result of which strengths and weaknesses, opportunities and threats for the agro-industrial sector were identified, and an optimal strategy based on the results of the analysis was proposed. The analysis was made by assistance of experts in the field, local authorities responsible for decision making in agriculture and food. Questions were distributed by link to google form and 25 respondents participated. The optimal strategy is selected based on the minimax matrix, for which, first and foremost, it is necessary to determine whether strengths or weaknesses, opportunities or threats prevail according to the results of the SWOT analysis. The combination of results allows determining the best management strategy – min-min, max-min, min-max or max-max.

Following the completion of the three stages, their results were analyzed and compared with the studies of international scientists. This section of the paper contains an analysis of current sector trends in the world, which include sustainable development, a trend towards an increase in the share of organic agriculture, and digitalization of all economic sectors. These trends are the most relevant and effective in the practice of world agriculture according to the results of a study of literary sources. Thus, an attempt was made at this stage to find solutions to the existing problems identified because of the study, by stimulating the introduction of innovative international practices in the economy of Kazakhstan, as well as identifying prospects and barriers to the introduction of innovations. Based on the results of all stages of the research, recommendations are proposed to improve the state of the agro-industrial complex and the prospects for further development of the industry are outlined separately in the areas of sustainable development, organic agriculture and digitalization.

Results and discussion

Modern economic conditions, including in the agro-industrial sector, are characterized by threats of various origins. In the context of the integration of the world economy, the threats of financial crisis, social tension, political instability, as well as the danger of a humanitarian catastrophe are common to the entire world community, but they have a particularly strong impact on developing countries. This is due to economic instability, insufficient experience in crisis management, constant increase in environmental requirements, rapid development of technology, lack of funding and highly qualified specialists, etc. These and other problems affect all economy sectors, especially agriculture, the share of which in the gross domestic product of developing countries is usually quite high. According to the classification of the International Monetary Fund, Kazakhstan belongs to developing countries, which determines the high relevance of studying the agriculture development trends in the Republic in the context of increasingly accelerating integration of the world economy.

Consideration of the initial conditions for the formation and development of the agricultural sector in Kazakhstan

Rural settlements in Kazakhstan were historically the first population centers prior to the development of cities. They represented the best traditions of the local culture, being both material and spiritual reflections of the general evolutionary formation. In recent years, Kazakhstan has adopted a number of laws and regulations governing the development of agriculture and rural settlements (Baytaeva, 2019). Thus, the historical prerequisites for the formation of the agricultural sector in Kazakhstan have led to the fact that today a significant share of the sector is represented not by professional participants, but by households. This has both advantages and disadvantages: the advantages include the preservation of local traditions and unique culture, employment of the rural population, the supply of buyers with local products. However, the disadvantages of such management are worth mentioning: sometimes the quality of small-scale farmers' products does not meet established standards, and the possibilities for appropriate quality control are reduced. This necessitates state control of households with the appropriate support of such business entities. In addition, the current state of the agro-industrial sector of Kazakhstan was affected by the expansion of acreage in the middle of the last century, which led to an increase in the share of crop production, while reducing the share of animal husbandry due to a reduction in the area allocated for livestock pastures.

The climatic conditions, in which the country's agriculture develops, should be considered for individual regions, since the vast territory of the country has led to significant differences in their climatic and geographical conditions. The climate of Southern Kazakhstan is characterized by high temperatures, therefore, properly organized artificial irrigation is necessary to increase productivity in this region. This will increase the yield of tobacco, sugar beets, rice and cotton. The climate of the region is also quite favorable for growing grapes. Western Kazakhstan has large areas of pastures and meadows, which contributes to the develop-

ment of animal husbandry (camels, sheep, horses). Rye, millet and barley are also grown in the region. Northern Kazakhstan specializes in raising sheep, meat and dairy cattle and poultry, as well as growing cereals and cotton. The agriculture of East Kazakhstan is characterized to the great extent by non-irrigated agriculture, large areas are allocated for the cultivation of sunflower. Arable areas near rivers are sown with peas, oats, and vegetables. Animal husbandry is represented by the breeding of meat and dairy cattle (Agriculture in Kazakhstan – climate, industry development, and characteristics, 2022).

Kazakhstan's government program aims at increasing the productivity and recognizes the need to support small-scale farmers. However, government payments for private goods such as agricultural raw materials, machinery or livestock cause overconsumption of resources when their marginal return is less than their total economic costs for the society. This not only leads to losses in economic welfare, but also reduces competitiveness due to inefficient use of resources. To ensure faster agricultural growth, government transfers should be redirected to proven productivity investments. In addition, development approaches and the creation of an enabling environment for agricultural growth require significant attention (Petrick, 2018). The above conditions for the formation and development of the agricultural sector in Kazakhstan are prerequisites for further research and a deeper understanding of the causal relationships of the retrospective and the current state.

Modern trends in the development of the sector

The study of current trends in the development of the country's agricultural sector is based on data from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan. An important indicator of improving the efficiency of agriculture in Kazakhstan is the increase in gross output from the Republic's independence to the present day (Figure 1).

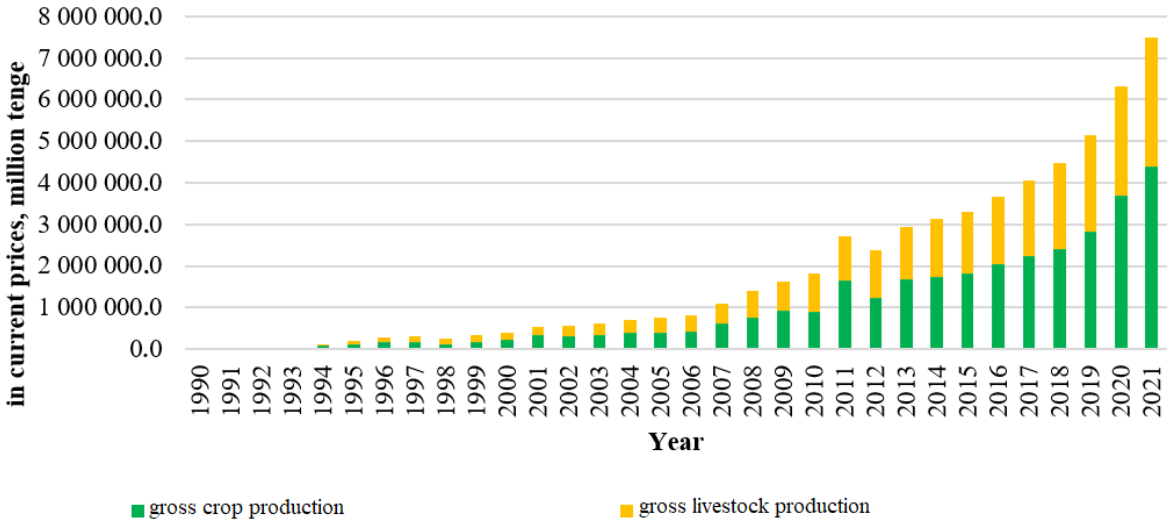

Figure 1 – Gross agricultural output in Kazakhstan
Note – compiled by the authors based on (Statistics of agriculture, forestry, hunting and fisheries, 2022).

As can be seen from Figure 1, Kazakhstan's gross agricultural output has shown significant growth since 1990. Higher growth rates and a share in the structure of agriculture in Kazakhstan are characteristic of crop production. Thus, government authorities should pay attention to the development of animal husbandry, the creation of additional areas for cattle grazing, high-quality feeding and care, appropriate conditions and wages for business entities engaged in animal husbandry. In addition, the increase in sown areas over the past fifteen years should be noted (Figure 2).

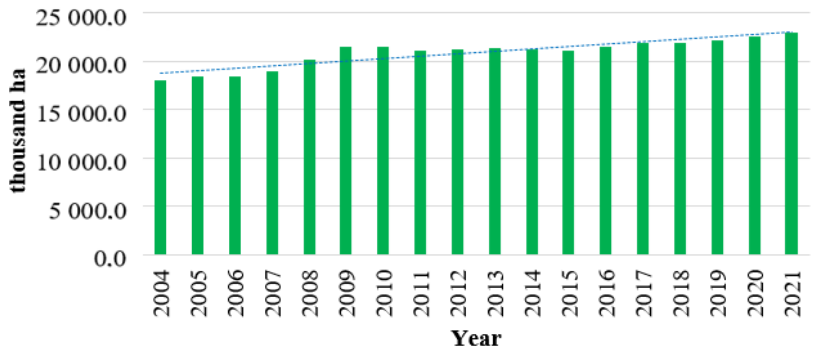

Figure 2 – Total adjusted sown area of agricultural crops
Note – compiled by the authors based on (Statistics of agriculture, forestry, hunting and fisheries, 2022).

Figure 2 indicates an increase in the area under crops, which contributes to the development of crop production and an increase in its gross output. This fact can be considered positive in the case when, due to the expansion of sown areas, the livestock grazing area is not reduced, so the state authorities need to pay attention to the balance or optimal ratio of areas for planting crops and livestock grazing. Data on the livestock production structure are presented in Figure 3.

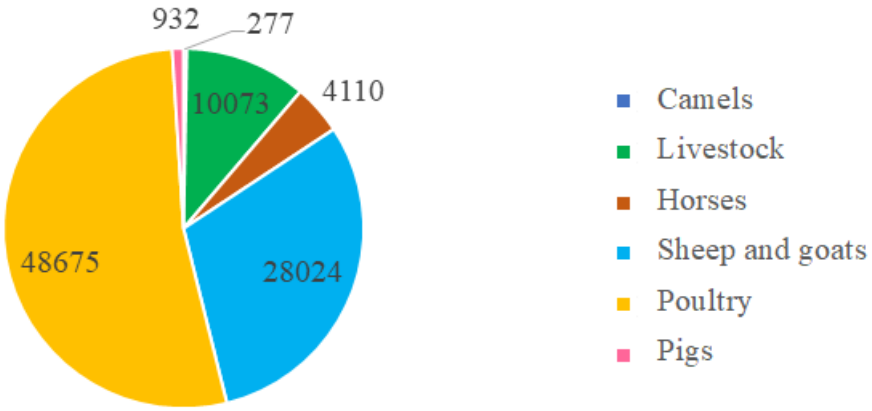

Figure 3 – Monthly number of livestock and poultry as of June 1, 2022, thousand animals
Note – compiled by the authors based on (Statistics of agriculture, forestry, hunting and fisheries, 2022).

As can be concluded from Figure 3, poultry prevails in the structure of the livestock and poultry numbers, sheep and goats are in second place, and cattle is third. This distribution is associated with the peculiarities of farming in Kazakhstan, cultural traditions, climate and other factors. The order that has developed naturally and is associated with the historical development of the sector should be actively supported and developed by state authorities, motivating and increasing the interest of the local population, providing priority areas with appropriate funding and innovations that optimize the management process. Table 1 contains information on the production of the main livestock products.

The production of the main types of livestock products can be increased through special attention to the development of this branch of agriculture, the use of undistributed lands to expand areas for cattle grazing, appropriate financing, improvement of living conditions, feeding, improvement of veterinary safety, qualification of specialists, etc. The structure of crop production is represented by the following types of products in appropriate proportions (Figure 4).

Table 1 – Production of main livestock products for May 2022

Types of livestock products	Quantity
Livestock and poultry slaughtered on the farm or sold for slaughter (live weight), thousand tons	147.179
Cow's milk, thousand tons	672.3853
Chicken eggs, million pieces	437.8175
Note – compiled by the authors based on (Statistics of agriculture, forestry, hunting and fisheries, 2022)	

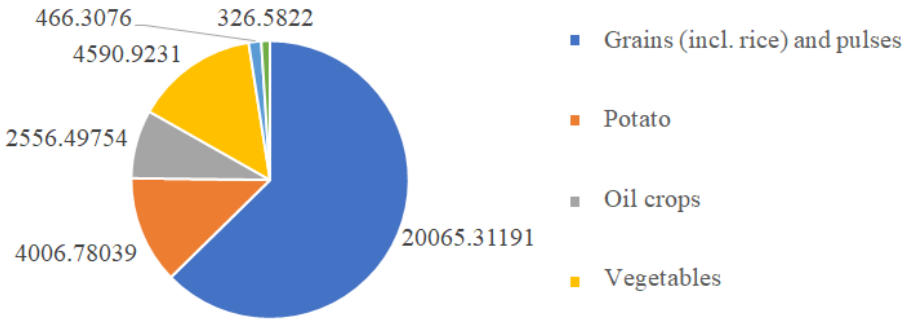

Figure 4 – Gross crop products harvest (thousand tons) in 2020
Note – compiled by the authors based on (Statistics of agriculture, forestry, hunting and fisheries, 2022).

As can be noted from Figure 4, grains, as well as vegetables and potatoes, are leading in the structure of gross crop production. Kazakhstan is the largest exporter of grains, which is the key to ensuring global food security. In addition to the gross harvest, crop yield is an important indicator of crop production (Figure 5).

As can be seen from Figure 5, the grain yield in Kazakhstan is quite low – it is several times inferior to the yield of the developed countries (for example, Germany) and developing countries (Ukraine, Azerbaijan). The methods to increase yields can be reduced to the technological reequipment of the sector, the introduction of digitalization, increasing of funding and the level of management. Thus, it can be concluded that Kazakhstan has a wide potential for the development of agriculture, but its implementation requires overcoming certain barriers and issues, which will be discussed in detail at the next stage of the research.

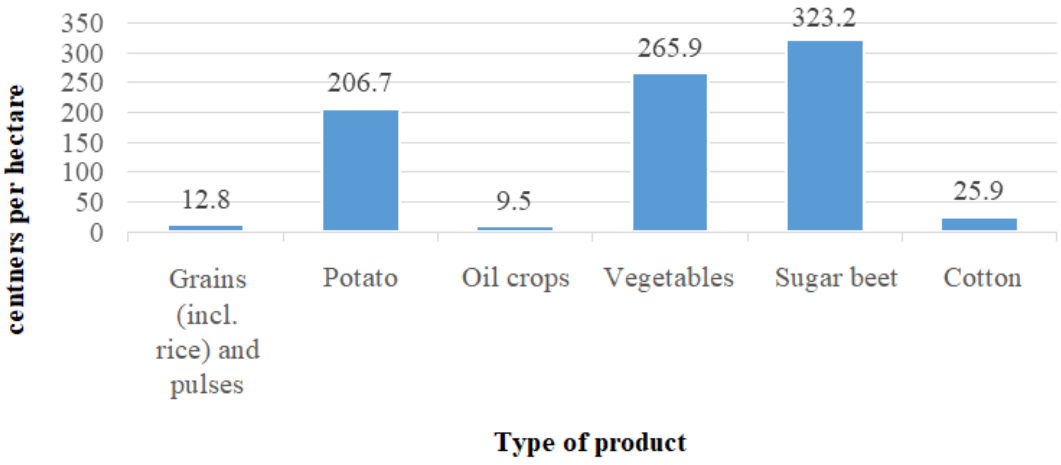

Figure 5 – Yield in 2020
Note – compiled by the authors based on (Statistics of agriculture, forestry, hunting and fisheries, 2022).

Analysis of the strengths and weaknesses, opportunities and threats of the agricultural sector in Kazakhstan and the choice of the optimal strategy

SWOT analysis allows identifying strengths and weaknesses, as well as opportunities and threats for the business. The SWOT analysis given in Table 2 defines these aspects for the agricultural sector of Kazakhstan as a whole, but they are also characteristic for each business entity separately.

Table 2 – SWOT analysis of the agricultural sector of Kazakhstan in the context of the world economy integration

Strengths	**Weaknesses**
Diversity of climatic and geographical conditions enables the development of a wide range of livestock and crop sectors. Availability of extensive sown areas. Low labor costs. High export potential.	Relatively low share in the country's GDP. Decrease in areas allocated for pastures. The sector is largely represented by small-scale households. Insufficient funding of the sector. Reduced efficiency and deterioration of fixed assets. Low wages. Lack of sectoral logistics of product turnover. Low attractiveness for investors. Questionable export prospects for high-quality livestock products. Mixed effect of agricultural subsidies. Unequal conditions for access to state support. Insufficient level of veterinary and food safety.
Opportunities	**Threats**
Increasing support for small commodity producers. Huge potential for renewable energy production. Desire to reduce the greenhouse effect and increase energy production from alternative sources. Efforts are being made to increase export potential.	Environmental threats include the lack of water resources and their reduction, air pollution. Small population of the country and its low density in the presence of vast territories threatens to increase transport costs and imposes difficulties in increasing the output volume.
Note – compiled by the authors based on (Shejkin, 2018); (Tokbergenova, 2018); (Jianzhong, 2018); (Rustamov, 2020); (Lukhmanova, 2019).	

The SWOT analysis carried out in Table 2 allows concluding that the weaknesses of the agricultural sector in Kazakhstan prevail over the strengths, while the opportunities outweigh the threats. It would be advisable to dwell on individual weaknesses and opportunities in more detail. As noted in Table 2, a significant share of the sector falls on small-scale producers, whose products are sometimes characterized by unsatisfactory quality, which, among other things, reduces their export potential. There is a need for appropriate certification and control of such enterprises. Low wages are set due to the lack of competition, which entails a lack of highly qualified specialists in the sector. The absence of sector-specific logistics of product turnover is more beneficial for intermediaries, rather than manufacturers, reducing the interest of the latter. The low attractiveness for international investors as well as for private investments is due to unequal conditions for competition between private and state capital. Doubtful prospects for the export of quality livestock products exist in view of the fact that most of it is represented by households. Providing subsidies to agriculture as well as subsidizing interest rates has an ambiguous effect, distorting the market mechanisms for setting interest rates in the sector. Unequal terms of access to government support from large and small producers contribute to social stratification (Shejkin, 2018).

As for the opportunities, it can be added that increasing support for small-scale producers will help preserve cultural values and supplement consumption structure with organic products. In addition, given a very large but sparsely populated area, Kazakhstan has a huge potential for renewable energy production, in particular wind power. Kazakhstan is a party to the Kyoto Protocol and the Paris Agreement and thus seeks to reduce the greenhouse effect and increase energy generation from alternative sources. In addition, efforts are being made in Kazakhstan to increase the export potential of agricultural products, which will be known under the single brand "Made in Kazakhstan" (Jianzhong, 2018). The matrix presented in Figure 6 is intended to determine the strategy for agricultural enterprises, which are characterized by the prevailing of weaknesses over strengths and opportunities over threats.

Figure 6 – Determination of the enterprise strategy based on the results of the SWOT analysis
Note – compiled by the authors based on (Chowdhury, 2019).

Looking at Figure 6, it is necessary first of all to determine whether weaknesses or strengths prevail in the enterprise's activities. Then the researcher establishes whether opportunities or threats affect the activities of the enterprise more. The strategy is chosen at the intersection of these two. Analysis of Table 2 allows saying that weaknesses prevail in the agricultural sector of Kazakhstan according to the results of the SWOT analysis – their number is much larger than the number of strengths, and the cumulative impact on the sector is stronger. It can also be concluded that the sector is characterized by ample opportunities that prevail over the threats. Thus, the minimax strategy (weaknesses and opportunities – WO) is suitable for agricultural enterprises in Kazakhstan. It is worth clarifying that the analysis was carried out according to the average characteristics of the sector, so other combinations of indicators and, accordingly, other strategies may be typical for individual enterprises.

However, most agricultural enterprises should apply a minimax strategy in their activities. This strategy involves minimizing weaknesses and maximizing opportunities. Its goal is to transform internal weaknesses by capitalizing on external opportunities. Company management should discover various alternatives in order to abstract from weaknesses and take control of the opportunities that appear in the process. It is always a wise decision to remove or correct flaws and realize opportunities. Example: If a company does not have experience in any of the areas of business that are necessary for growth, and it is given the opportunity to team up with another company that has the necessary experience, this can be quite a convenient situation for both companies (Chowdhury, 2019).

It is necessary to see the need for adaptive strategies to address regional inequalities, aiming to boost agricultural productivity and foster sustainable growth across Kazakhstan (Kenzheali, 2024).

Modernization of the agricultural economy entails not only an innovative, but also a multiplier effect (transport infrastructure in rural areas of Kazakhstan, logistics, warehouse and wholesale distribution infrastructure, pre-sale preparation of agricultural products, storage facilities for agricultural products, special tractors of small and medium power, equipment for gardening, irrigation systems) (Kurmanova, 2021).

Early reforms facilitated macroeconomic stability and market liberalization; the economy remains highly dependent on raw material exports (Shukeyev, 2025).

Conclusion

The study of the process of formation and development of agriculture in Kazakhstan, as well as modern statistical data, suggests that there is some stagnation in the sector. From the foregoing, it can be concluded that farmers in Kazakhstan prefer to follow established traditions, farm with outdated

management methods, use depreciated fixed assets, and the state allocates insufficient funds to the sector, while the efficiency of public funding is quite low. A possible solution to the above problems can be a focus on stimulating the introduction of innovative international practices into the economy of Kazakhstan, which corresponds to the strategy determined at the previous stage, since the introduction of international experience is designed to minimize weaknesses by realizing opportunities. In the context of this issue, it is useful to consider the following concepts: sustainable development of the agricultural sector; organic agriculture; digitalization of the agro-industrial sector. This choice of concepts is due to their high relevance today, which is confirmed by numerous studies by Kazakh and international scientists (Laurett et al., 2021; Tokbergenova et al., 2018; Meemken, 2018; Baytaeva, 2019; Rustamov et al., 2020; Bahn et al., 2021; Ehlers et al., 2021; Akhmedyarov, 2019).

The general concept of sustainable development is to balance the interests of society, economy and business, as well as the environment. Sustainable development in the agricultural sector can be considered an important ally in addressing environmental issues, minimizing inequalities, improving food quality and reducing soil damage and the adverse effects of chemical products, etc., given the growing demand for food production for a growing population. As for the environmental situation in the country, it can be argued that today it requires increased attention. The main environmental issues include:

- lack of water resources (ecological catastrophe of the Aral Sea, ecological issues of Lake Balkhash);
- radioactive, bacteriological and chemical contamination of land resources (Semipalatinsk region, where the military space test site was located and where nuclear weapons were tested for 40 years);
- air pollution (the permissible level was exceeded in fifteen large cities);
- accelerated climate change (Yessymkhanova, 2021).

Researchers A. Tokbergenova, L. Kiyassova, S. Kairova (2018) identify the following main directions of sustainable development of agriculture in Kazakhstan:

- introduction of undistributed lands into agricultural production, ensuring employment in the rural areas, development of animal husbandry;
- development of a state social housing construction program to secure specialists in the rural areas, provision of marketing infrastructure and upgrade of educational, medical, cultural and sports facilities;
- establishment of industrial production in rural settlements, taking into account specialization and application of benefits;
- attraction of international full-cycle agricultural companies, rational use of production and export potential, search for new markets (Tokbergenova et al., 2018).

The above recommendations allow concluding that scientists pay more attention to two of the three sustainable development pillars – economic and social well-being, while not paying enough attention to the third, environmental aspect. However, the study conducted in the article focuses on the environmental safety of agriculture in view of the presence in the country of a number of issues associated with environmental pollution. Thus, it is advisable to supplement the recommendations of the researchers with the following:

- conservation and renewal of natural resources, namely, ensuring the purity of air and land, rational water use through the introduction of environmental technologies into production;
- ecological problems of Lake Balkhash associated with shallowing, increased concentration of harmful substances, as well as poaching deserve special attention, and their solution requires government measures, including international ones, since some of the issues are related to China's activities regarding the settlement of the Ili River, which is the main artery of the lake;
- preservation of soil fertility by calculating the optimal amount of fertilizers applied, the use of organic fertilizers, adaptation of modern soil fertility preservation technologies to local conditions;
- use of renewable resources, such as wind energy, solar energy, etc.

The idea of organic agriculture is a qualitative addition and expands the possibilities of the sustainable development concept. It arose at the beginning of the twentieth century in the context of urbanization and the expanded use of agrochemical resources. Organic standards cover crop production, animal husbandry, beekeeping, aquaculture and recycling. Organic production includes nutrient recycling, banning synthetic fertilizers and chemical pesticides, using organic fertilizers, feeding animals with organic feed, as well as providing adequate space and access to outdoor areas. From 2000 to 2015, the global area of certified organic agriculture increased from 15 million hectares to 51 million hectares (Meem-

ken, 2018). Motives for the consumption of organic products are as follows: environmental safety of food products; high quality and freshness of products; best taste qualities of organic products; preservation of the natural environment in the production process; absence of genetically modified organisms (Baytaeva, 2019).

Legislative regulation of organic production in Kazakhstan began with the adoption of a relevant law at the end of 2015. Since then, the main regulations on organic production as well as regulatory and technical documents have been developed and adopted. In particular, three standards for organic products came into force in 2018, including a mark confirming the conformity of organic products (Baytaeva, 2019). Kazakhstan has about 300 thousand hectares of organic land certified in accordance with international standards. The following should be developed and approved for the successful development of organic production in the country:

- technical regulations for the production of organic products and raw materials;
- procedure for assessing the suitability of soils for organic production;
- procedure and requirements for labeling organic products;
- national system of certification, accreditation of state control over the activities of the subjects of production, transportation, storage, sale of organic products;
- Straightening scientific research and organize the training of qualified personnel in the field of organic farming (Baytaeva, 2019).

The effectiveness of introducing digitalization to enterprises, including those in the agricultural sector, is confirmed by the example of developed and developing countries that make the most of its benefits: thanks to digitalization, the productivity of international enterprises increases significantly (Bahn, 2021). This applies to the entire production cycle, from speeding up the workflow to the calculation of the required amount of fertilizers applied to the soil. The positive effects of digitalization include a reduction in the cost and an increase in the speed of "paper" work, an increase in product quality due to the optimal amount of fertilizers, an increase in the efficiency and environmental friendliness of the entire production process, etc.

The participation of Kazakhstan in integration associations, in particular in the Eurasian Economic Union, helps to synchronize the direction of movement towards the digitalization of agriculture. Y. Akhmedyarov (2019) specifies the establishment of information platforms and technological reequipment as the main recommendations for the transition to the digital structure of the agricultural market. Such recommendations are somewhat lengthy and general, and therefore require detailing. Based on the research results, the following more specific recommendations can be made regarding the transition to digital agriculture:

- development of legal support for digitalization and provision of financial support from the state;
- technological reequipment of the sector;
- increasing investment in science and technology in the field of agriculture;
- analysis and minimization of possible risks;
- creation of conditions that enable agricultural enterprises to use the experience of international companies, access to satellite data, information about the latest technologies, etc.

Taking into account the considered recommendations for improving agriculture in Kazakhstan will allow developing the agro-industrial sector in three main areas – sustainable development, organic agriculture and digitalization, which will ensure faster agro-industrial integration, efficient and safe management, taking into account the interests of entrepreneurs, consumers and the environment. Comparison of own research results with the findings obtained by Kazakh and international scientists allows stating that the authors' research lacks an integrated approach to solving issues and developing recommendations, on the basis of which their research results were expanded and supplemented with their own developments.

Thus, government authorities need to pay attention to animal husbandry, namely, to provide additional areas from undistributed lands, as well as to provide high-quality animal feeding and veterinary care. The third stage of the study contains a SWOT analysis of the agricultural sector in Kazakhstan, which includes an analysis of the strengths, weaknesses, opportunities and threats for the country's agriculture. Based on the analysis, it was found that the optimal strategy for agriculture in Kazakhstan is the minimax strategy, which involves minimizing weaknesses by maximizing opportunities and it is advisable to use the world experience and practice of farming in the context of the most relevant trends today, which are sustainable development, organic agriculture and digitalization.

References

1. Agriculture in Kazakhstan – climate, industry development, characteristics. (2022). https://cutt.ly/BC7ACTh
2. Akhmedyarov, Y. (2019). Agricultural market digitalization in Kazakhstan. *Economics. Ecology. Socium*, *3*(4), 1–9.
3. Among the CIS countries, the indicators of Kazakhstan in terms of the weight of the agricultural sector in GDP are the weakest. (2022). https://cutt.ly/lC7RMD0
4. Bahn, R. A., Yehya, A. K., & Zurayk, R. (2021). Digitalization for sustainable agri-food systems: Potential, status, and risks for the MENA region. *Sustainability*, *13*(6), Article 3223.
5. Baytaeva, G. R., & Dyrka, S. (2019). Managing the development of the sector of organic agriculture of Kazakhstan. *News of the National Academy of Sciences of the Republic of Kazakhstan*, *1*(323), 218–227.
6. Chowdhury, O. (2019). What is the TOWS Matrix? And how it is used? https://cutt.ly/SC7BsV9
7. Ehlers, M.-H., Huber, R., & Finger, R. (2021). Agricultural policy in the era of digitalisation. *Food Policy*, *100*, Article 102019.
8. Jianzhong, X. U., Assenova, A., & Erokhin, V. (2018). Renewable energy and sustainable development in a resource-abundant country: Challenges of wind power generation in Kazakhstan. *Sustainability*, *10*(9), Article 3315.
9. Kornilova, A. A., Mamedov, S. E., Khorovetskaya, Y. M., Karabayev, G. A., & Kiseleva, T. A. (2018). Historical aspects of the formation of rural settlements in northern Kazakhstan during the pre-revolutionary period. *Terra Sebus. Acta Musei Sabesiensis*, *10*, 271–285.
10. Kenzheali, Y., & Makhmetova, A. (2024). Analysis of sustainable agricultural development in Kazakhstan: Key economic and climatic indicators. *Eurasian Journal of Economic and Business Studies*, *68*(4), 47–60. https://doi.org/10.47703/ejebs.v68i4.440
11. Kurmanova, G. K., Sukhanberdina, B. B., & Urazova, B. A. (2021). Modernization of agrarian economy in the Republic of Kazakhstan. *Economics: the strategy and practice*, *16*(3), 35–50.
12. Laurett, R., Paco, A., & Mainardes, E. W. (2021). Measuring sustainable development, its antecedents, barriers and consequences in agriculture: An exploratory factor analysis. *Environmental Development*, *37*, Article 100583.
13. Lukhmanova, G., Baisholanova, K., Shiganbayeva, N., Abenov, B., Sambetbayeva, A., & Gussenov, B. S. (2019). Innovative development of the agricultural sector of the Republic of Kazakhstan. *Revista Espacios*, *40*(32), 1–9.
14. Meemken, E. M., & Qaim, M. (2018). Organic agriculture, food security, and the environment. *Annual Review of Resource Economics*, *10*, 39–63.
15. Petrick, M., Raitzer, D., & Burkitbayeva, S. (2018). *Policies to unlock Kazakhstan's agricultural potential* In: *Kazakhstan. Accelerating Economic Diversification (pp. 21-72)*. Manila: Asian Development Bank.
16. Rustamov, J., Kirchner, C., & Katto-Andrighetto, J. (2020). *Status-quo analysis of the institutional and legal framework of organic agriculture in Kazakhstan*. https://agrardialog-kaz.de/wp-content/uploads/2021/03/statusquo-organic-report_en_fin.pdf
17. Shejkin, D. (2018). *Agriculture in Kazakhstan: Overview of agriculture in Kazakhstan*. https://halykfinance.kz/download/files/company-documents/research/agr2018.pdf
18. Shukeyev, U., Mendaliyeva, Sh., & Maulina, N. (2025). Structural economic transformations in Kazakhstan: Historical context, contemporary challenges, and strategic approaches. *SHS Web of Conferences*, *212*, 03004. https://doi.org/10.1051/shsconf/202521203004
19. Statistics of agriculture, forestry, hunting and fisheries. (2022). https://stat.gov.kz/official/industry/14/statistic/7
20. Tokbergenova, A., Kiyassova, L., & Kairova, S. (2018). Sustainable development agriculture in the Republic of Kazakhstan. *Polish Journal of Environmental Studies*, *27*(5), 1923–1933.
21. Tulegenova, M., & Mejirbek, N. (2020). Trends in the development of agriculture in the Republic of Kazakhstan. *Scientific Collection "InterConf"*, *2*(35), 39–48.
22. Uspambayeva, M., Zeinelgabdin, A., Turebekova, B., Rakayeva, A., Tulaganov, A., & Taipov, T. (2020). Agriculture in Kazakhstan: Effective financial management. *Brazilian Journal of Political Economy*, *40*(3), 554–565.
23. Yessymkhanova, Z., Niyazbekova, S., Dauletkhanova, Z., Dzholdoshev, N., & Dzholdosheva, T. (2021). Environmental safety in the countries bordering Kazakhstan in the context of sustainable development. In *E3S Web of Conferences: XXII International Scientific Conference Energy Management of Municipal Facilities and Sustainable Energy Technologies* (pp. 1–9). Les Ulis: EDP Sciences.

Information about authors:

Abdigul Gulzhaukhar – Senior Manager, Department for Strategic Development, S.Seifullin Kazakh Agro Technical Research University (Astana c., Kazakhstan, e-mail: zhaukanai_ak@mail.ru);

Balkibayeva Aida – C.e.s, associate professor, Department of Social-Humanitarian Disciplines, Academy of Physical Education and Mass Sports, (Astana c., Kazakhstan, e-mail: ambal1974@mail.ru);

Assanova Gulnara – C.e.s, associate professor, Chief Consultant of the Department for Support of Civil Initiatives of the central office of the Republican Public Association "Auyl Partiyasy" (Astana c., Kazakhstan , e-mail: assanga@mail.ru);

Iskakova Damira – Director, C.e.s, Researcher, Scientific and Production Enterprise "Innovator" LLP (Astana c., Kazakhstan, e-mail: damirais61@mail.ru).

Авторлар туралы мәлімет:

Әбдігүл Гүлжаухар Қазболатқызы – аға менеджер, Стратегиялық даму жөніндегі департамент, С. Сейфуллин атындағы Қазақ агротехникалық зерттеу университеті (Астана қ., Қазақстан, e-mail zhaukanai_ak@mail.ru);

Балкибаева Аида Максутовна – э.ғ.к., қауымдастырылған профессор, Әлеуметтік-гуманитариялық пәндер кафедрасы, Дене шынықтыру және бұқаралық спорт Академиясы, (Астана қ., Қазақстан, e-mail: ambal1974@mail.ru);

Асанова Гульнара Абдильдиновна – э.ғ.к., қауымдастырылған профессор, "Ауыл партиясы" Республикалық қоғамдық бірлестігі Орталық аппаратының азаматтық бастамаларды қолдау департаментінің бас консультанты, (Астана қ., Қазақстан, e-mail: assanga@mail.ru);

Искакова Дамира Максутовна – э.ғ.к., директор, ««Инноватор» ғылыми-өндірістік кәсіпорын» ЖШС, (Астана қ., Қазақстан, e-mail: damirais61@mail.ru).

Received: 14 January 2024
Accepted: 4 March 2025