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Competitiveness of Kazakhstan's Agricultural Export: Influencing Factor Analysis

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ABSTRACT: *The research, "Competitiveness of Kazakhstan's Agricultural Exports: Influencing Factor Analysis," delves into deciphering the factors that shape the competitive landscape of Kazakhstan's agricultural exports on the global stage. Employing comprehensive analytical tools like descriptive statistics and regression models, this study scrutinizes pivotal determinants including production efficiency, infrastructure development, policy formulations, and technology integration. Kazakhstan has showcased a consistent uptrend in export volume and value in recent years, prominently driven by cereals such as wheat and flour, constituting over 60% of total exports. However, a gradual decline in grain exports has resulted in Kazakhstan falling out of the top 10 global grain exporters since 2015. Projections forecast a substantial global surge in both wheat production and consumption by 2026. This study underscores the paramount significance of bolstering production efficiency, enhancing infrastructure, implementing favorable policies, embracing technological innovations, and diversifying export strategies to fortify Kazakhstan's agricultural export competitiveness. The findings from this comprehensive analysis provide policymakers, industry stakeholders, and researchers with critical insights to devise targeted strategies aimed at elevating Kazakhstan's agricultural exports to greater competitiveness on the international platform.*

KEYWORDS - *Agricultural exports, competitiveness, global trade, influencing factors, Kazakhstan*

I. INTRODUCTION

Kazakhstan's agricultural sector has emerged as a key player in the global market, marked by a significant contribution to the nation's economy through agricultural exports. This burgeoning sector has showcased remarkable growth, positioning Kazakhstan as a notable exporter of agricultural commodities. The competitive dynamics governing the country's agricultural exports are underpinned by a multitude of factors encompassing climatic conditions, soil quality, infrastructural development, government policies, and international trade engagements. Understanding the intricate interplay of these factors is pivotal in delineating strategies aimed at enhancing Kazakhstan's agricultural export competitiveness on the global platform. This research endeavors to delve into the comprehensive analysis of the competitive landscape surrounding Kazakhstan's agricultural exports. Leveraging empirical methodologies, including descriptive statistical analysis and regression modeling, this study scrutinizes the determinants dictating the competitiveness of Kazakhstan's agricultural products in international markets. By examining the intrinsic drivers and impediments, this research seeks to unravel the nuanced intricacies shaping the country's agricultural export landscape. The scope of this study encompasses an in-depth exploration of key facets influencing export competitiveness, encompassing the pivotal roles of production efficiency, infrastructure development, policy formulations, technological innovations, and export diversification strategies. Through meticulous analysis, this research aims to elucidate critical insights into the strengths, challenges, and opportunities inherent in Kazakhstan's agricultural export sector. By unraveling the multifaceted dimensions of Kazakhstan's agricultural export competitiveness, this study intends to offer policymakers, industry stakeholders, and researchers a robust framework for formulating targeted strategies aimed at bolstering the nation's position in the global agricultural export arena.

This study makes a significant contribution to understanding Kazakhstan's agricultural export competitiveness by employing a multifaceted approach. It combines quantitative analysis, utilizing credible trade data and economic models like the Gravity Model and Comparative Advantage Theory, with qualitative insights obtained from interviews and surveys with key agricultural stakeholders.

II. LITERATURE REVIEW

The term "comparative advantages" was coined by economist David Ricardo, who expanded on Adam Smith's notion of absolute advantages. According to (David Ricardo et al., 2005), comparative advantages arise when one nation is more equipped for the production of one thing than another. This indicates that the opportunity costs of production in one country are lower than in the other. Despite this, neoclassical economists Eli Heckscher and Bertil Ohlin (Feenstra et al., 2004) described comparative advantages as a pattern based on resource endowment differences. However, it should be noted that analyzing comparative benefits and verifying the Hecksher-Ohlin theory presents some difficulties because the comparable costs under autarky are not visible. Given that reality, Balassa suggests that there is no need to include all components of assessing a country's comparative advantage. As an alternative, according to (Balassa et al., 1965), comparative advantage is "revealed" through observable trade patterns. According to (Laursen et al., 1998), the RCA measure's appeal stems from its relative simplicity, ability to employ a comparable set of data, such as trade data based on SITC analysis, and dependability as a measure of genuine changes in the fundamentals of real comparative advantages. It should be noted that the approach proposed by Balassa is more commonly utilized for empirical estimates of nations' specialization and comparative advantage, including Kazakhstan. Kazakhstan's agricultural competitiveness was examined by researchers. (Espolov and Kerimova et al. 2004) investigated the competitiveness of Kazakhstan's agricultural products on the CIS market, whereas (Khatibi et al. 2008) investigated Kazakhstan's RCA on the EU market and discovered that, while Kazakhstan has a demonstrated comparative advantage in certain sectors, its competitiveness has declined in nearly all industries.

The works of such Kazakhstan scientists as Ahmet D.M., Bukatov S. such Russian researchers as Trufljak E.V., Kurchenko N.U., Magomedov A.M. in addition to overseas scientists Benyam A.A., Debauche O., Hafeez A., Jerhamre E., Jones J.W., Mishra S.K., Namani S. they take into consideration the theoretical and methodological elements of the usage of virtual technology in rural regions. At the same time, they attempted to expose the excessive significance of virtual factors and additionally paid awesome interest to the evolution of the digitalization procedure of the agro-commercial complex. Most of the modern-day studies are aimed toward characterizing new farming methods, such as "clever farms" (Jerhamre, Carlberg et al. 2022), "cloud technology" (Debauche et al., 2021), "precision farming" (Jones et al., 2017), etc., at the same time as those research are more often than not descriptive, indicating how those technology work, what are their ben suits and regions of application.

Nevertheless, those works poorly describe the possibilities and presently current obstacles inside the geographical region for the creation of those technologies for a selected production. Thus, notwithstanding the exceptionally huge number of clinical guides and guides associated with the digitalization of agriculture in recent years, a few troubles have now no longer been studied sufficiently. These encompass troubles associated with figuring out the quantitative dependencies of virtual elements and overall performance signs of rural enterprises, in addition to assessing the correspondence among the impact capability of those technologies and the opportunities in their implementation in rural regions in precise financial conditions (Namani & Gonen et al., 2020).

III. DATA COLLECTION AND METHODOLOGY

The In the study of Kazakhstan's Agricultural Export Competitiveness, a systematic framework examines the key factors impacting its global market competitiveness, employing qualitative and quantitative methods. It aims to categorize influential factors, utilizing economic theories and trade frameworks. Data collection involves diverse sources, such as government reports, interviews, and statistical databases, analyzed using statistical tools and econometric models. The analysis delves into market, technological, policy, and environmental aspects influencing Kazakhstan's agricultural exports. Key components include market penetration, price competitiveness, and product quality evaluation. Comparative analysis benchmarks Kazakhstan's sector against global peers, identifying strengths and weaknesses. Policy recommendations aim to enhance export competitiveness. Regarding precision farming in East Kazakhstan, methodologies like economic-statistical and monographic studies were used, evaluating existing conditions and constraints. There are 17,669 registered agricultural establishments in Kazakhstan, with 15,317 active ones, comprising small, medium, and large businesses. In East Kazakhstan, 1,241 active agricultural formations account for about 7% of

the country's total. Surveying over 1,000 agricultural enterprises in the region, the study revealed inadequate utilization of digital technologies. Approximately 75% of farmers surveyed did not use precision farming technology, with 10% being unfamiliar with it. This highlights a need for greater awareness and adoption of digital tools in the region's farming practices.

DATA COLLECTION

The data for this study on Kazakhstan's Agricultural Exports are influencing factor analysis was gathered using a multifaceted strategy that included primary and secondary sources. Secondary source is International Trade Databases such the WTO, the United Nations Comtrade database, and the FAO were used to get information on Kazakhstan's agricultural exports. Official papers and publications from Kazakhstan's Ministry of Agriculture, Ministry of Trade and Integration, and other related governmental entities gave critical insights into policies, laws, and trade data. Academic publications and research articles on Kazakhstan's agricultural exports, competitiveness, and affecting variables were studied in order to gain background information and insights from current studies. To collect specialized market information and industry-specific statistics, reports from agricultural trade groups, industry organizations, and market research firms were reviewed. Primary data surveys are those that were done among important agricultural stakeholders such as farmers, exporters, policymakers, and industry experts. The surveys were aimed to collect particular information on variables impacting Kazakhstan's agricultural export competitiveness. In-depth interviews and consultations were held with specialists in the subject, including academics, government officials, industry executives, and agricultural association members. These conversations gave qualitative insights and nuanced viewpoints on the topic. Case studies on selected agricultural firms and export endeavors were done in order to get extensive, context-specific information on their operations, problems, and accomplishments. The following is visits to agricultural production sites, export facilities, and key infrastructure were made to collect first-hand observations and evaluate information gained via other means of data collecting.

Data Source and Data Collection Path:

(1) World Trade Organization (WTO), United Nations Comtrade database, Food and Agriculture Organization (FAO) international trade databases

(2) Kazakhstan's Ministry of Agriculture, Ministry of Trade and Integration, and other related governmental entities are the sources of these documents.

(3) Sources include a variety of academic databases (Google Scholar, JSTOR, and Web of Science). Access was obtained through institutional subscriptions or open-access platforms, and relevant papers were located using comprehensive literature searches.

(4) Reports were either purchased or obtained through subscriptions, and some were available for download straight from the websites of the various organizations.

(5) Farmers, exporters, policymakers, industry experts, and agricultural companies provided primary data (surveys, interviews, case studies, and field visits).

(6) Surveys were sent electronically or in person, interviews were done in person or via video conferencing, case studies entailed direct contact with the selected firms, and on-site field trips were conducted.

Overall, those dataset technique provided a solid platform for the research of influencing variables impacting Kazakhstan's agricultural export competitiveness. It enabled the balanced integration of quantitative and qualitative information from diverse agricultural stakeholders.

METHODOLOGY

The study employs quantitative analysis of export trends, values, and destinations using credible trade data sources. It utilizes economic models like the Gravity Model and Comparative Advantage Theory to assess factors affecting competitiveness. Qualitative analysis involves interviews and surveys with key agricultural stakeholders for insights. Policy recommendations focus on trade policy adjustments, technology adoption, and market expansion. Kazakhstan's top exports span oil, gas, metals, chemicals, and grain, with primary partners including China, Russia, and European nations. Key imports cover machinery, food, metals, and vehicles, sourced mainly from Russia, China, and European countries. The Comparative Advantage Theory underscores

the need for Kazakhstan to specialize in producing agricultural goods where it holds a competitive edge, considering resources, technology, and comparative production costs.

The first theory that has been used is Comparative Advantage Theory (CAT, it aids in long-term agricultural planning, tech investments, infrastructure [David Ricardo et al., 2005], and market expansion. It helps identify Kazakhstan's naturally competitive agricultural products. CAT suggests countries focus on producing items where they excel, making them cheaper than others. This specialization leads to more efficient resource use, boosting overall production and economic prosperity. It supports free trade, arguing that barriers like tariffs limit global welfare by hindering countries from specializing in their comparative advantage areas.

$$CAT = X''ij'' / \Sigma Xij$$

Where:

Xij = Value of exports of product i by country j

Σ Xij = Total value of exports of product i by all countries

Second theory is the Gravity Model Theory (GMT) [Jan Tinbergen et al., 1962], it suggests that larger economies trade more and geographical proximity influences trade. For Kazakhstan, this means bigger economies are significant trade partners. Closer countries are more likely to import Kazakh agricultural products due to lower transportation costs, highlighting potential competitive advantages. GMT emphasizes the importance of transportation infrastructure. The fundamental gravity model is as follows:

$Yij = \alpha$ (GDPi GDPj)/ Distanceij

Yij indicates the total trade volume of exporting country i to importing country j, GDPi indicates the country's economic aggregate, GDPj indicates the country's economic aggregate. The geographical distance between two countries is represented by Distanceij, and the regression parameter is α.

Assessing the quality of transportation links between Kazakhstan and trading partners reveals the competitiveness of agricultural exports. It also evaluates the impact of trade agreements on exports, where reduced barriers can boost exports. Additionally, GMT predicts future trade flows based on economic size and distance changes. This helps anticipate how alterations in these factors will affect Kazakhstan's agricultural export competitiveness. Overall, GMT provides insights into factors affecting Kazakhstan's agricultural export competitiveness, aiding policymakers in developing trade strategies and policies.

IV. RESULTS AND FINDINGS

The strategic initiative encompasses acquiring modern farming equipment, deploying agricultural technology, and enhancing farmer education. While agricultural profit increased the GDP by 4 trillion tenge in 2019, and animal husbandry contributed 2 trillion tenge annually, the sector has shown a 3.6% growth this year. Government programs like the "Agriculture Digitalization: E-APK" and "Digital Kazakhstan" are pivotal in this transformation, showcasing a 23% increase in agricultural output in 2020 compared to 2019, as illustrated in Table 1. Notably, this growth isn't solely attributed to digital advancements but is influenced by increased agricultural product values, superior seeds, mineral usage, and overall production enhancements. Despite the nascent stage of digital technology adoption in agriculture, assessing rural enterprises' investments in information technology will ascertain the impact of digitalization on agricultural practices.

Table 1. Offers the general photograph of modifications withinside the essential signs of agriculture

Indicators	Years			Growth rate during 8 years, %
	2018	2019	2020	
Meat (in slaughter weight), thousand tons	1 059,4	1 120,6	1 168,6	34,2
Milk, thousand tons	5 686,2	5 864,9	6 051,4	22,7

Eggs, million pieces	5 591,4	5 531,4	5 065,8	30,0
Grain yield, centner per hectare	13,5	12,3	12,8	10,3
Potato yield, center per hectare	197,9	203,4	206,7	13,9
Oilseed yield, centner per hectare	9,7	9,3	9,5	18,8
Livestock of cattle, heads	7 151	7 436	7 850	34,2
Livestock of small cattle, heads	18 699	19 156	20 058	14,2
Note – Compiled by the authors based on the Bureau of National statistics				

The rising use of information technology demands a surge in skilled professionals, pivotal for technological advancement. However, despite positive trends, there remains a weak implementation of digitalization in rural areas, evident in minimal technology investments, such as the 0.37% spending on information and communication technology compared to the U.S. (389 million tenge). Analyzing the relationship between digital parameters and agricultural productivity in Table 2 will ascertain their impact on overall village output dynamics.

Table 2. Correlation table displaying the relationships between digitalization factors and overall rural production.

	1	2	3	4	5	6	7
The volume of agricultural production, billion tenge	1						
Enterprises using computers	0,9572	1					
Enterprises using cloud technologies	0,9802	0,9617	1				
Computers with Internet	0,9497	0,9480	0,9422	1			
Number of specialists	0,0021	-0,0298	-0,0774	0,2283	1		
ICT spending, million tenge	0,9678	0,9109	0,9650	0,9612	0,1319	1	
Firms using the Internet	0,9677	0,9876	0,9645	0,9746	0,0446	0,9293	1
Note — Compiled by the authors							

As may be visible from Table 3, there is a great correlation among the dynamics of virtual signs and the gross extent of agricultural production (over 0.9), besides for the parameter of the variety of specialists, in which the connection may be very low, almost imperceptible. Based at the acquired data, it's miles viable to decide the regression equation among the required parameters and the overall performance indicator in Table 3.

Table 3. Regression analysis results

Indicators	Coefficient	Determination coefficient	Number of Observations
Free term of the equation	2 822,77		

Number of enterprises using computers	-0,144	0,994	8
Number of enterprises using cloud technologies	-3,895		
Number of computers with Internet	-0,665		
Number of IT specialists	1,429		
Expenditure on ICT technologies	4,911		
Number of firms using Internet portals	2,893		
Note — Compiled by the authors			

Kazakhstan stands as a key global exporter of wheat and flour, ranking among the top 10 in the world, while its land and resources have untapped potential for expanding grain production. Eastern and Southeastern regions thrive in oilseeds, sugar beets, maize, fruits, and vegetables, with substantial exports in cotton and rice. The nation's agricultural focus primarily revolves around grain farming, offering bread and livestock fodder. Although cereals and flour account for over 60% of exports, Kazakhstan witnessed a gradual decline in grain exports since 2015, dropping from its peak of $3.4 billion in 2012 to $2.1 billion in 2017, constituting 6% of total national exports. Global wheat output is projected to grow by 10.6% until 2026, with consumption following suit by 12.9%, reaching 815.3 million tons (Fig 1).

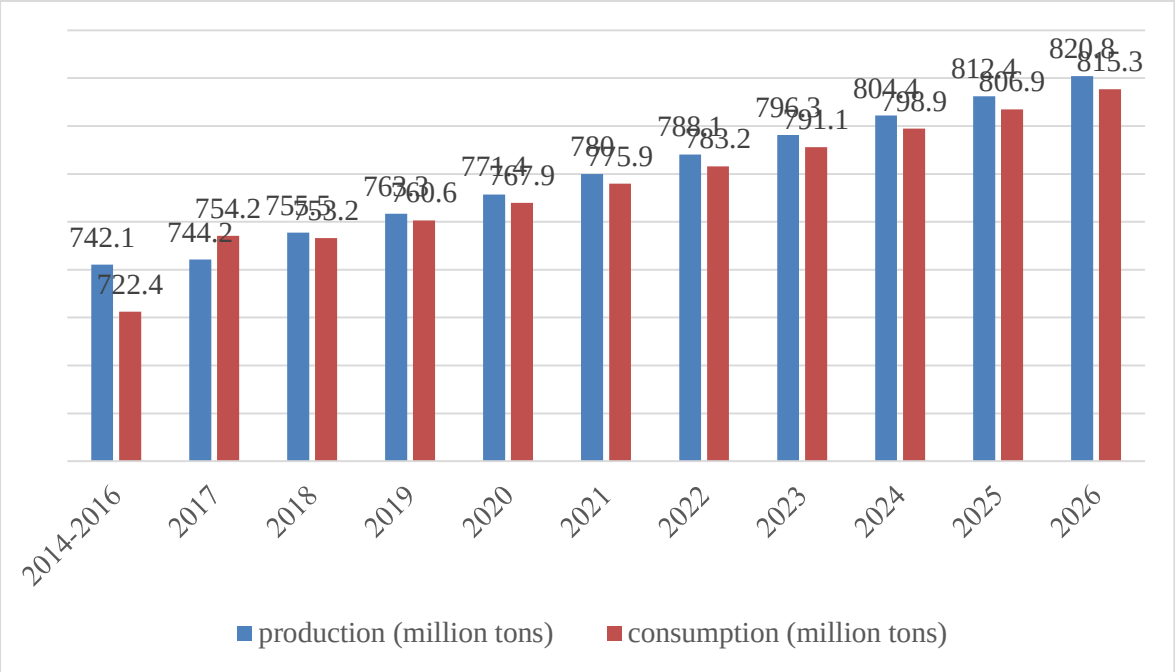

Fig. 1 Projection for global wheat production and consumption between 2017 and 2026

The projections for 2026 indicate an anticipated rise in wheat acreage by 1.8% to 226.7 million hectares, with a 7.6% increase in final wheat stocks to 243.5 million tons. Globally, wheat exports are predicted to surge by 15.3% to 191.1 million tons, leading to an estimated 20.1% growth in the global wheat price to $248.9 per ton. Additionally, by 2026, maize production and consumption are anticipated to rise, with an expected output of 1,163.7 million tons (13.6%) and consumption reaching 1,161.2 million tons (14.4%), as illustrated in Fig. 2.

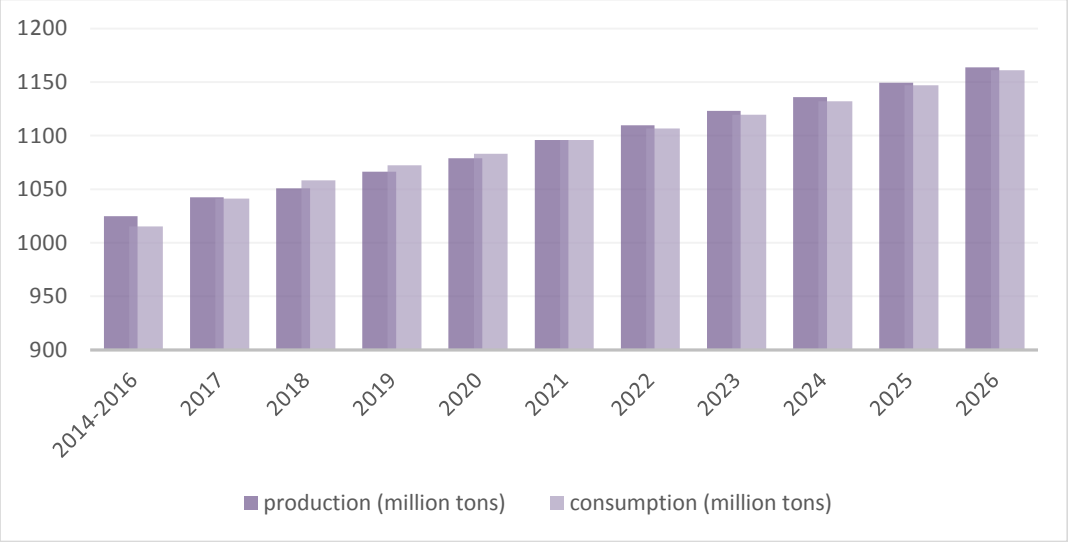

Fig. 2 Forecast of world corn production and consumption for 2017-2026

Forecasts for 2026 anticipate an 8.7% decline in final corn stocks to 208.8 million tons. Corn exports are estimated to rise by 14.2% by 2026 compared to the average from 2014-2016, totaling 154.5 million tons. Corn acreage is projected to increase by 2.2% globally, reaching a total area of 181.8 million hectares. The OECD and FAO predict a significant surge in world maize prices by 19.7% to $196.7 per ton by 2026. Projections for rice production and consumption globally foresee expansions to 560.9 million tons and 560.1 million tons, respectively, marking a 13.4% and 13.2% growth. Furthermore, the global rice price is expected to rise by 10.8% to $415.5 per ton, as depicted in Fig. 3.

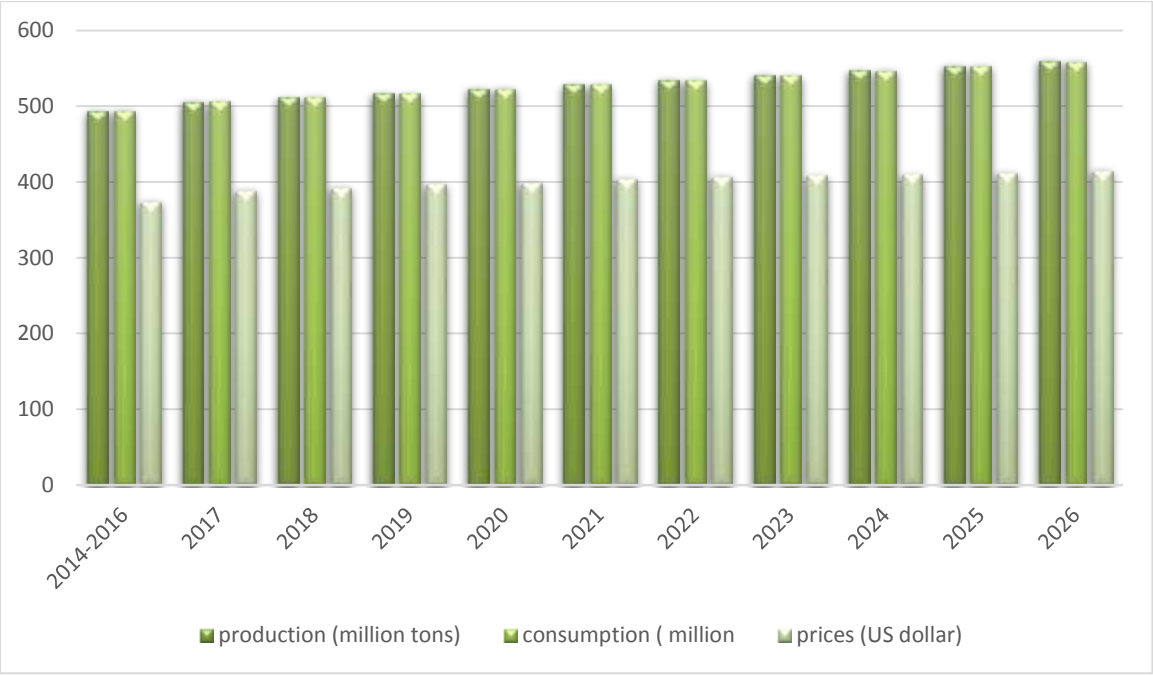

Fig. 3 Estimate of global rice production, consumption, and prices expected between 2017 and 2026.

OECD and FAO forecasts suggest a 1.2% increase in global rice acreage to 164.2 million hectares by 2026. Rice exports are expected to rise by 16.3% to 51.2 million tons. However, final rice stocks are predicted to decrease by 2.8% to 166.8 million tons by 2026. Kazakhstan's agricultural science drives crop and livestock production. It boasts around 160 varieties and hybrids approved for use, including 39 potato varieties and 103 vegetable

varieties. Notably, Akmola reported an 18.6% increase, generating a gross output of 976.6 billion tenge ($2.09 billion), and Turkestan's output increased by 2% to 950.6 billion tenge ($2.03 billion). Additionally, Almaty City made a significant contribution, yielding 279.2 billion tenge (nearly $605 million) in agricultural output from January to November 2022 (Fig.4).

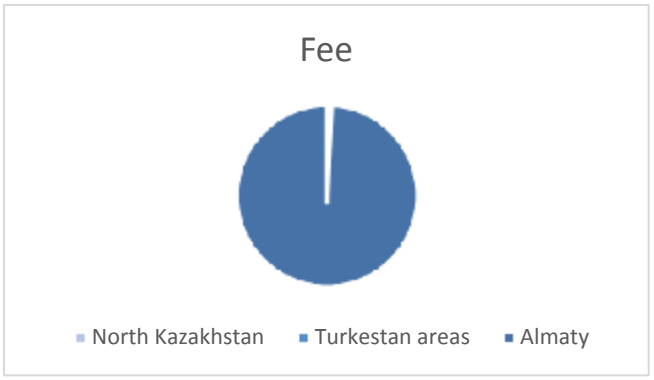

Fig.4 The overall fee of agriculture, forestry, and fishery gross output

In 2022, official data (Fig. 5) reveals the distribution of wheat exports from Kazakhstan to neighboring countries. Uzbekistan imported 3 million metric tons (47.1%) of Kazakhstan's exported wheat, followed by Tajikistan with 986,700 metric tons (15.5%) and Afghanistan with 686,700 metric tons (10.8%). Notably, Kazakhstan, not sharing a border with Tajikistan and Afghanistan, channels its exports to these countries through Uzbekistan.

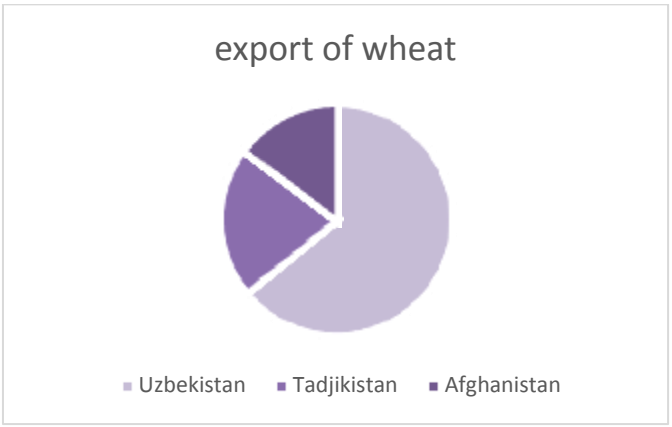

Fig. 5 Export of wheat to CIS countries

V. CONCLUSION AND RECOMMENDATIONS

Kazakhstan agriculture exports influencing factor analysis gives vital insights into the dynamics driving the country's agriculture sector's competitiveness in the global market. Through the descriptive statistical analysis and regression modeling, this research has included a full review of major drivers such as production efficiency, infrastructure, policy environment, and technology adoption, the data show that Kazakhstan's agriculture export business is dynamic and robust.

Over the last 5 years, the country has shown consistent increase in both export volume and value, demonstrating its growing importance on the global agricultural trade arena. The diversity of export commodities, which includes cereals, oilseeds, and value-added goods, demonstrates the sector's capacity to respond to changing market needs. Through careful regression analysis, critical impacting factors were found and quantified. Production efficiency emerges as a linchpin, demonstrating that investments in contemporary agricultural methods and technology contribute considerably to increased export competitiveness.

Influential factors discovered a number of critical factors influencing Kazakhstan's agricultural export competitiveness. Notably, production efficiency and infrastructure emerged as key factors influencing export success. The study emphasized the critical role of production efficiency in improving export competitiveness, increased agricultural productivity correlates positively with increased export performance. Infrastructure development shows the critical role of robust infrastructure in Kazakhstan's agricultural exports. Improving transportation networks, storage facilities, and logistics all contribute significantly to export efficiency. The findings demonstrated the direct impact of the policy environment on agricultural export competitiveness. Favorable policies are critical in encouraging and facilitating export activities, thereby stimulating growth in this sector.

The role of technology adoption established a link between technology adoption and export outcomes. Adopting technological advancements has a positive impact on Kazakhstan's agricultural exports, increasing productivity and competitiveness.

Efforts to diversify agricultural products can reduce reliance on specific commodities and mitigate market volatility risks. The investigation emphasized the strategic importance of specific export destinations, recognizing key markets and concentrating efforts in these areas can help to increase export success and market penetration. An inclusion of qualitative findings from stakeholder surveys, interviews, and case studies enriched the analysis by providing nuanced perspectives and contextualizing quantitative results within the context of the broader export landscape.

In essence, these findings emphasize the critical importance of improving Kazakhstan's agricultural export competitiveness through increased production efficiency, infrastructure development, favorable policies, technological innovation, and diversification strategies. A strategic focus on these factors, combined with ongoing research and policy development, has the potential to drive long-term growth and expansion in the agricultural export sector.

Kazakhstan's policy environment has shown to be effective, offering a stable and supportive framework for agricultural exports. Transparent rules and trade agreements have created a favorable climate for corporate growth and international commerce. Furthermore, the use of sophisticated agricultural technology has a favorable link with export success, demonstrating the sector's resilience and ability for innovation.

However, obstacles like as market access constraints, price volatility, and climate-related hazards remain, addressing these issues will be critical to guaranteeing Kazakhstan's agricultural exports' long-term growth and competitiveness. Strategic interventions in market diversification, risk management, and value addition offer considerable prospects for growth. The combination of empirical data and stakeholder insights provides policymakers, industry leaders, and stakeholders with useful information for developing tailored strategies for Kazakhstan's agricultural exports' sustained development and competitiveness on the world arena. This study not only adds to the unique context of Kazakhstan, but it also provides ideas and approaches that may be applied in comparable settings across the world.

REFERENCES

Journal Papers:

[1] Ricardo D. From the principles of political economy and taxation //Readings in the economics of the division of labor: The classical tradition. – 2005. – С. 127-130.
[2] Balassa, "Trade Linearization and 'Revealed Comparative Advantage," Manchester School, vol. 33, no. 2, pp. 99-123, 1965.
[3] K. Laursen, "Revealed comparative advantage and the alternatives as measures of international specialisation", DRUID Working Paper No. 98-30, 1998.
[4] A. Khatibi (2008), "Kazakhstan's Revealed Comparative Advantage Against the EU-27," ECIPE working paper no. 03, pp. 12-16.
[5] T.I. Espolov and U.K. Kerimova (2004), "Increase of agricultural efficiency in conditions of integration with foreign markets," Journal of Agrobusiness, vol 2, no 10-14.
[6] Abdelouahid R. A., Debauche O., Marzak A. Internet of things: a new Interoperable IoT platform. Application to a smart building //Procedia Computer Science. – 2021. – Т. 191. – С. 511-517.

[7] Jones JW, Antle JM, Basso B, Boote KJ, Conant RT, et al. 2017. Toward a new generation of agricultural system data, models, and knowledge products: state of agricultural systems science. Agric. Syst. 155:269–88

[8] Namani S., Gonen B. Smart agriculture based on IoT and cloud computing //2020 3rd International Conference on Information and Computer Technologies (ICICT). – IEEE, 2020. – С. 553-556.

Books:

[9] Feenstra R. C. Advanced international trade: theory and evidence. – Princeton university press, 2015.

[10] Casten Carlberg C. J., Jerhamre E. Artificial Intelligence in Agriculture: Opportunities and Challenges. – 2021.