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EXAMINING THE IMPACT OF THE AGRICULTURAL INDUSTRY ON KAZAKHSTAN'S ECONOMY: TRENDS, CHALLENGES AND OPPORTUNITIES

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ABSTRACT

Purpose. By analyzing the relationship between agricultural production, emissions, agricultural employment and local communities, the study aims to highlight the role of agriculture in economic development, as well as provide specific recommendations for policymakers in prioritizing agriculture.

Methods. The authors use linear regression as a methodology to establish and identify the relationship between agricultural indicators and GDP growth. The data was taken from various reliable sources, such as the Statistics Agency of the Republic of Kazakhstan and the World Bank. The regression includes both dependent variables (GDP) and independent variables (agricultural activity). Statistical tests are also presented to assess the significance and reliability of the findings.

Originality / Value. The article presents new evidence of the dependence of the economy of the Republic of Kazakhstan on the agricultural sector. The uniqueness of the work lies in the identification of the main problems of the agricultural sector and the proposed solutions. The consideration of carbon dioxide emissions and rural employment issues adds a special scientific depth to the study.

Findings. The regression analysis identified factors that directly influence the growth of the GDP of the Republic of Kazakhstan. Moreover, the R-square indicates that a significant portion of the variance in the dependent variable can be explained by the selected independent variables, demonstrating the model's effectiveness in identifying the key determinants of agricultural productivity. As observed from the research results, Kazakhstan's agricultural sector requires more attention compared to the industrial sector. This sector

is responsible for the growth of GDP and economic productivity, with empirical evidence supporting this. By supporting agrarian policies and investments, it is possible to combat poverty and sustainably develop the rural population.

Keywords: Dutch disease, agriculture, economic growth, production indices, CO2 emissions, employment, rural population.

INTRODUCTION

In the midst of a pandemic and a prolonged global economic downturn, Kazakhstan's agricultural sector has significant potential to lead the country out of its current economic crisis. By leveraging resources effectively and reforming the subsidy system, Kazakhstani agro-industrial complex can become a competitive player in international markets and pave the way for diversifying the national economy.

Currently, agriculture accounts for less than 5% of Kazakhstan's GDP. Since the 2000s, rising global oil prices have led to a decrease in agriculture's GDP share. As a major oil exporter, Kazakhstan experienced an increased exchange rate, accelerated domestic price growth, and a significant outflow of human resources and funds to the booming oil industry. This phenomenon, commonly known as "Dutch disease," has adversely affected agriculture and the manufacturing sector [1].

Key obstacles hindering the development of the agro-industrial complex include weak implementation of state programs, limited access to financing, a lack of qualified personnel, drought, low wages, and low production volumes. Additionally, entrenched corruption in the distribution of state subsidies hampers the effectiveness of national projects aimed at developing the agro-industrial sector.

Our research suggests that while the agricultural sector faces numerous challenges, these are not insurmountable. The 2021-2025 national project targets 4.1 trillion tenge, export growth, labor productivity, agricultural processing, and expanded irrigation [2]. Adding to this fact, clear digital and paper-based monitoring for land seizure and transfer, stringent financial oversight to prevent corruption, and a reformed subsidy system are crucial steps. Effective implementation of responsibilities and personal accountability at all levels are essential.

Literature review. The agricultural sector in Kazakhstan holds significant potential to drive the country's economy. To realize this potential, several key factors and strategies need to be addressed, drawing insights from various scholars and reports.

Lio and Liu [3] argue that effective government control is essential for enhancing agricultural productivity. Better management by the government can lead to significant improvements in productivity without changing climatic conditions or input resources. Protecting property rights and ensuring contract reliability are also critical, as these measures enhance the competitiveness of the agricultural sector by promoting the adoption of new technologies, equipment, and innovations [3].

However, Kazakhstan's agricultural sector has faced challenges due to the "Dutch disease," as discussed by Timur Aliev. Since gaining independence, the share of agriculture in the GDP has declined, especially in the 2000s when global oil prices surged. This phenomenon, common in oil-exporting countries, has led to a focus on the extractive industry at the expense of agriculture, despite its importance for economic diversification [4].

The International Bank for Reconstruction and Development highlights the persistent issue of rural poverty in Asia, which has parallels in Kazakhstan. Despite high economic growth rates, rural poverty remains widespread, with over 600 million rural residents living in poverty. The report suggests that job creation through agricultural diversification is crucial. Developing and supporting linkages between agro-industry and other industries can create a bridge between rural and urban areas. This type of approach could work well for Kazakhstan, thereby reducing regional poverty and stimulating economic growth [5].

North [6] identified two arguments regarding the contribution of agriculture to economic growth. One of the arguments shows that there is some dependence on the availability of agricultural products in stocks. This affects operational efficiency and reduces the obstacles encountered in industrial growth. The following argument shows that economic growth and growth in general varies over time and depends on location, for example, there is a difference between urban industrial areas and rural industrial areas. North stresses the importance of regional capability in integrating into larger markets through exports, which in turn can lead to sustainable growth and diversified economic activities [6].

Semenova [7] emphasizes the multifactorial relationship between agricultural employment and economic growth. Key factors for economic growth include increasing investment, utilizing idle labor, improving workforce skills, reclaiming land, and enhancing production methods, all boosting demand, income, and savings [7]. Other authors also connect agriculture and employment, for example Chang (2011) aims to examine labor movement within Taiwan's agricultural sector in order to elucidate the relationship between agricultural policy and adjustment issues, focusing on estimating the labor movement function. The methodology involves analyzing the movement of labor between the agricultural sector and other sectors through empirical analysis of migration patterns. This analysis highlights how various policy factors impact the incentives for labor migration and hinder off-farm labor migration. Factors include price support policies, incomplete farmland conversion regulations that encourage farmers to retain land, and government agricultural spending, including direct transfers. By simulating the removal of these policies, the study reveals their impact on labor migration dynamics [8].

Prokhorova et al. [9] advocate for the diversification of agricultural sectors as a foundation for efficiency in a market economy. The agro-industrial complex (AIC) should be recognized as a critical component of the national economy. The key objectives for the agro-industrial complex (AIC) are to meet food and consumer goods needs, ensure food security by reducing import dependence, enhance system efficiency, and support the economic and social interests of agricultural workers [9]. The governmental injections were also reviewed by Gylfason et al. [10]. He was focusing on several reasons why natural resource abundance and widespread agriculture seem to impede economic growth worldwide. He presents empirical, cross-sectional evidence from transition economies in Eastern and Central Europe, as well as Central Asia, since 1990. The central argument posits that heavy dependence on natural resources and agriculture can lead to rent-seeking behaviors, such as corruption, and policy failures, such as inflation. Additionally, this reliance may also discourage investment in education, international trade, and genuine savings, ultimately slowing down economic growth. The researchers conclude the paper with a brief discussion of policy implications drawn from the study's findings [10].

Effective government control, addressing the impacts of "Dutch disease," bridging the rural-urban income gap, leveraging agricultural employment for economic growth, and diversifying agricultural sectors are crucial steps. By implementing these measures, Kazakhstan can transform its agro-industrial complex into a competitive and vital part of the national economy, fostering economic diversification and resilience.

MAIN PART

Methodology. Kazakhstan, nowadays, has all of the resources, land, weather conditions and other possibilities for agricultural development. However, as we can see on the Figure 1 below, the weight of agriculture in overall GDP is very small. In the first quarter of 2024, the economic landscape unveiled a varied distribution across sectors in the country. Agriculture, forestry, and fishing accounted for a modest yet significant 2.3% of the economic activity. Despite its numerical modesty, this sector serves as the cornerstone of sustenance, intertwining livelihoods with the land, and preserving a rich cultural heritage deeply rooted in the soil.

The industrial sector dominated the economic scene with a robust 28.8 %, reflecting the nation's prowess in manufacturing, mining, and quarrying. Manufacturing alone contributed 13.8 %, symbolizing innovation, productivity, and employment opportunities. Mining and quarrying, constituting 12.8 %, showcased the nation's resource exploitation capabilities. Electricity, gas, steam, and air conditioning supply represented 1.9 %, underpinning the infrastructural backbone vital for industrial operations and societal comfort. Meanwhile, the water supply; sewerage, waste management, and remediation activities accounted for 0.3 %, signifying the essential yet often overlooked services ensuring public health and environmental sustainability. Construction, standing at 4.4 %, symbolized growth, development, and urbanization, as the nation continued to build its future. Yet amidst this diverse economic tapestry, agriculture, forestry, and fishing stood out not just as a statistic, but as a testament to resilience, tradition, and the enduring bond between humanity and nature.

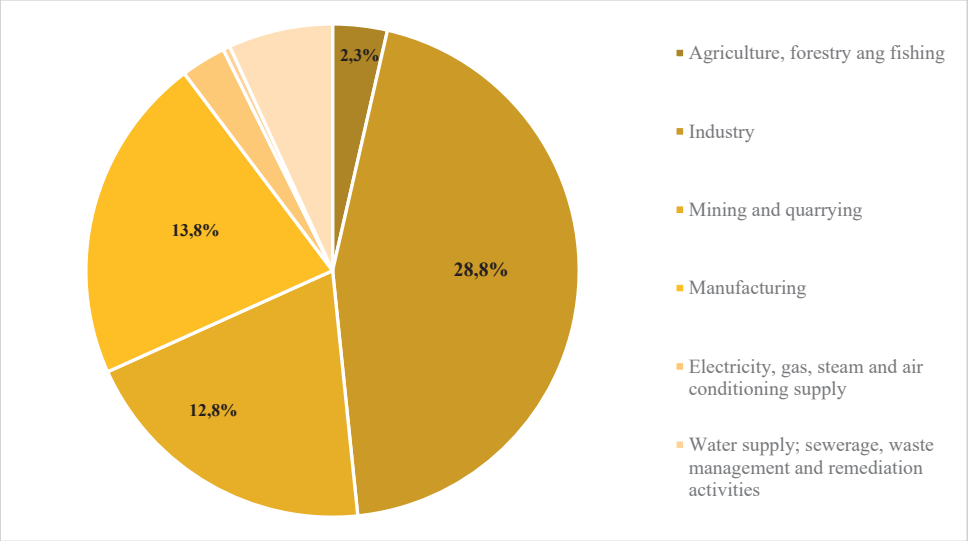

Figure 1 – Structure of GDP by the production method (1st quarter 2024)
Note – Compiled by the author based on [11]

Agriculture directly contributes to GDP through the production and sale of agricultural raw materials. As exports of these materials increase, they contribute positively to GDP growth by generating revenue and creating employment opportunities (Figure 2). The Figure below illustrates the trajectory of agricultural raw materials exports and imports as a percentage of merchandise trade over several decades. Beginning at 2.81 % in 1995, exports peaked at 3.15 % in 1996 before gradually declining. Similarly, imports started at 2.09 % in 1995, fluctuating thereafter. The gap between them varied significantly, ranging from wide surpluses to narrow balances. For instance, in 1996, the gap was substantial, indicating a surplus in exports. Conversely, in 2007, the gap narrowed, suggesting a closer balance between exports and imports. This interplay reflects a nation's competitive advantage, resource management, and market dynamics.

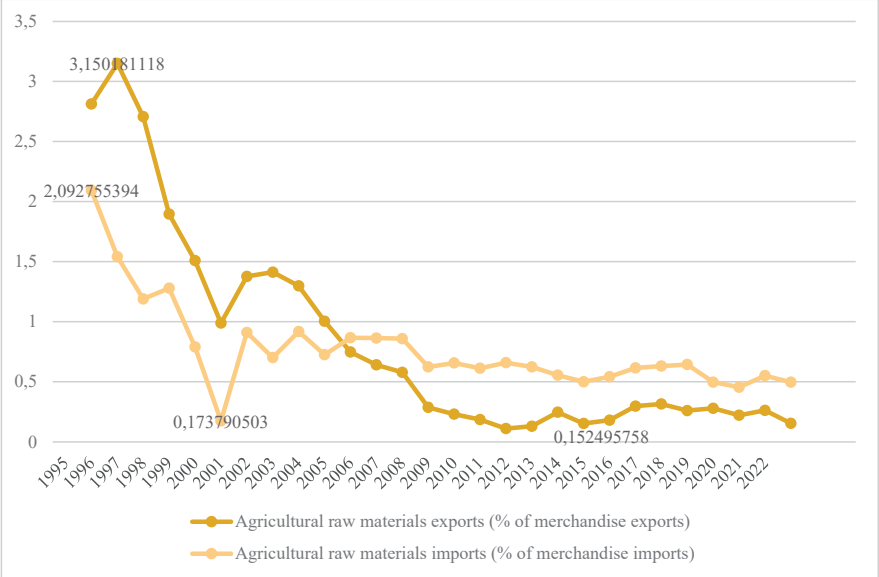

Figure 2 – Agricultural raw materials export and import
Note – Compiled by the author based on [12]

The connection between agricultural raw materials exports and imports is intertwined with various factors such as domestic production capacity, international demand, trade policies, and market dynamics. High levels of agricultural raw materials exports relative to imports can indicate a competitive advantage in production, efficient resource utilization, or strong demand in global markets. Conversely, a higher level of imports compared to exports may signify either a domestic shortage of certain raw materials, reliance on foreign sources to meet domestic demand, or preferences for imported varieties due to quality or price considerations. Nowadays, the gap between export and import is going to be narrowed.

As, we consider the agricultural development and economic growth, we took main production indices, as food, crop and livestock. They are crucial metrics used to assess changes in agricultural output over time. The food production index tracks overall food production within a country, encompassing crops, livestock, fisheries, and forestry products. It serves as a vital indicator of food security and self-sufficiency. The crop production index specifically measures changes in crop volume, spanning cereals, vegetables, fruits, and oilseeds, providing insights into agricultural productivity and food availability. Meanwhile, the livestock production index monitors variations in livestock and livestock product volumes, such as meat, milk, and eggs, reflecting the health and performance of the livestock sector. These indices collectively inform policymakers, researchers, and stakeholders about agricultural performance, aiding in the formulation of strategies to enhance productivity, ensure food security, and foster economic development [13] (Figure 3).

Figure 3 – Production indices (food, crop, livestock)

Note – Compiled by the author based on [12]

Livestock index reflects changes in the volume of livestock and related products. Despite fluctuations, it generally maintained an upward trajectory, reaching 124.81 by 2023. Peaks and troughs suggest variations in factors such as market demand, disease outbreaks, and climatic conditions. *Food production index* tracks overall food production, this index encompasses crops, livestock, fisheries, and forestry products. It displayed resilience, rebounding from downturns to peak at 127.76 in 2021, demonstrating the sector's ability to overcome challenges and adapt to changing conditions. *Crop production index* is focused on changes in crop volume, this index encompasses cereals, vegetables, fruits, and oilseeds. Despite fluctuations, it showed consistent growth, reaching 129.35 by 2023, driven by advancements in technology, improved agricultural practices, and increased market demand.

The livestock production index showed steadier growth than the food and crop indices, indicating resilience in livestock activities. On the other hand, the food production index, reflecting overall food production,

demonstrated a remarkable rebound from downturns, highlighting the sector's adaptability and importance for food security. Meanwhile, the crop production index exhibited consistent growth, driven by advancements in agricultural practices and technology.

For agricultural development, the country needs labor productivity as well. The relationship between economic growth and employment has been a topic of much debate. While the unemployment rate is typically seen as a lagging indicator, there is disagreement on whether employment itself is coincident or lagging [14].

The Figure 4 below shows the overall employment in agriculture and also the male and female difference (involved in the agricultural process). The overall percentage of employment in agriculture in Kazakhstan has been gradually declining over the years. It started at 36.66% in 1990 and decreased to 12.86% by 2023. This decline suggests a structural shift in the economy away from agriculture towards other sectors, such as industry and services.

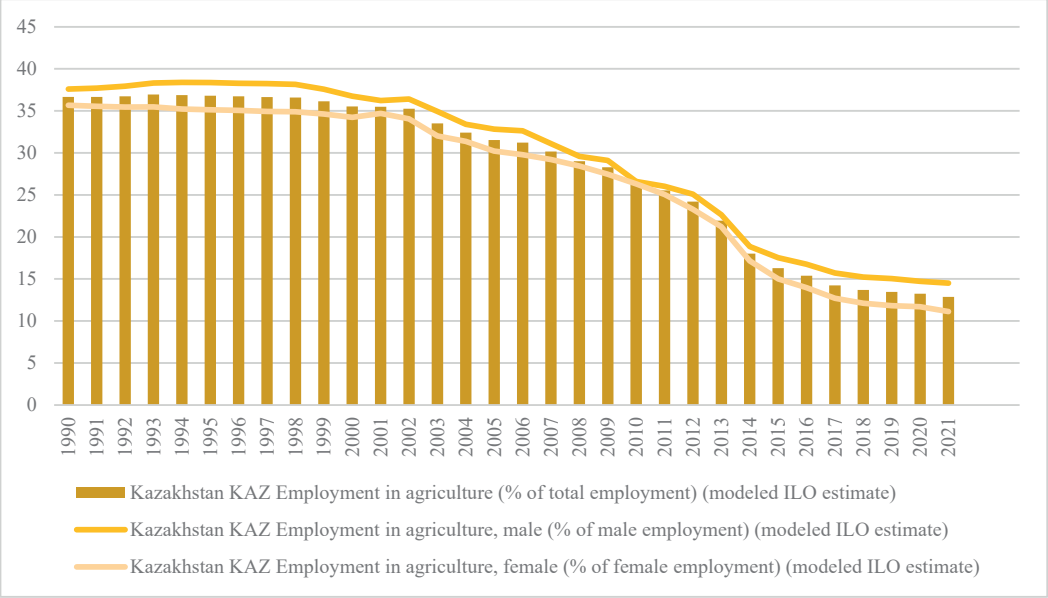

Figure 4 – Employment in agriculture (male and female) 1990-2021

Note – Compiled by the author based on [12]

Both male and female employment in agriculture followed a similar downward trend, although there were slight differences in the percentages. Male employment in agriculture started at 37.59% in 1990 and decreased to 14.51% by 2023. Female employment in agriculture started at 35.67% in 1990 and decreased to 11.13% by 2023. Despite the similar trends, male employment consistently remained slightly higher than female employment throughout the period.

The decline in employment in agriculture could be attributed to various factors, including technological advancements, mechanization of agriculture, and urbanization. This is supported by the share and very slight growth of rural population in Kazakhstan within last few years (Figure 5).

The percentage of Kazakhstan's population living in rural areas has been gradually declining over the years. It started at 43.73 % in 1990 and decreased to 42.01 % by 2023. This decline is indicative of a significant urbanization trend. More people are moving from rural areas to cities in search of better opportunities, infrastructure and services. A declining rural population often leads to a decline in the agricultural labor force and agricultural activities, which in turn leads to a decline in agricultural production. As rural residents migrate to cities in search of alternative employment opportunities, the agricultural labor force is declining, resulting in lower production and a widening gap between exports and imports of agricultural products. This link highlights the important role of rural populations in maintaining agricultural productivity and the broader impact of rural-to-urban migration on the agricultural economy.

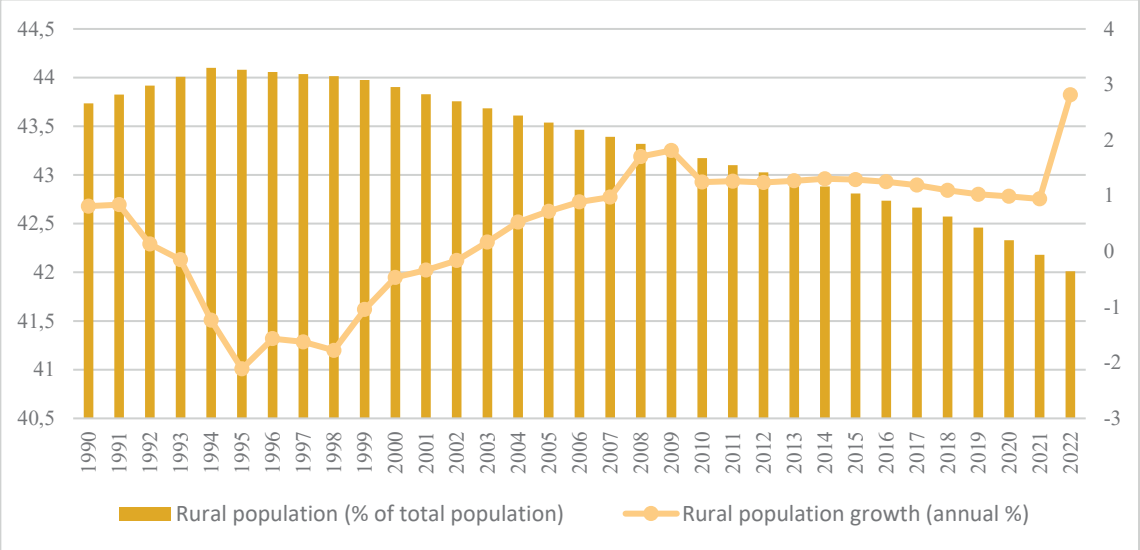

Figure 5 – Share and growth of rural population from 1990-2022

Note – Compiled by the author based on [12]

Previous studies have shown an interdependence between crop production indices and carbon dioxide emissions. More uneven relationship was found between livestock production and carbon dioxide emissions [15]. This study uses a regression model with GDP as the dependent variable to reflect economic growth (Table 1). In addition, given that Kazakhstan is a manufacturing-oriented country, carbon dioxide emissions are included as a factor in the analysis [16].

(1)

$$\hat{}GDPgrowth = 36.3 * LSPI201\_1 - 101 * FPI2014201\_1 + 61.6 * CPI2014201\_1 - 2.47 * CO2\_1 - 2.71 * AgRME\_1 + 6.36 * Emp\_1 - 0.877 * Ruralpop\_1$$

Where we apply:

Table 1 – Model variables description

Variable	Meaning (1991-2022)
GDPgrowth	Growth rate of GDP
LSPI (livestock production index)	A measure quantifying the output and productivity of livestock farming, including meat, dairy, and other animal products.
FPI (food production index)	An indicator gauging the overall productivity and output of food crops and livestock, reflecting the agricultural sector's ability to meet food demands.
CPI (crop production index)	A metric assessing the productivity and output of crop cultivation, encompassing various agricultural commodities such as grains, fruits, and vegetables.
CO2 emissions	Abbreviation for carbon dioxide emissions, a greenhouse gas emitted through various human activities, including combustion of fossil fuels, deforestation, and industrial processes.
AgRME (agricultural raw materials export)	The quantity and value of agricultural commodities exported from a country, including raw materials like crops, livestock products, and other agricultural produce.

Emp (Employment in agriculture)	The number of individuals engaged in agricultural activities within a specific region or country, providing insight into the labor force distribution across various sectors.
Ruralpop (Total rural population)	The collective number of inhabitants residing in rural areas within a given geographical area, offering insights into demographic patterns and rural development dynamics.
Note – Compiled by the author based on [12] *** All of the variables are represented in logarithms (LN)	

Results and discussions. We built a regression model. We included all the variables described earlier to test our established hypothesis. The variables were selected for several reasons; primarily there is both theoretical significance and empirical evidence that suggests an impact on the dependent variable. This variable represents a fundamental aspect in agricultural production and environmental sustainability. We also took variables of livestock production, crop production, and food production, which in general, for example, show the overall productivity of rural production. At the same time, variables such as CO2 emissions and agricultural land reflect the environmental aspects and consequences of agricultural activities. In addition, the importance of human capital and demographic dynamics take into account socio-economic factors and are determined by such factors as the rural population, agricultural employment.

According to the regression model, we get the following results (Table 2).

Table 2 – Regression model. Agricultural impact on GDP growth.

Variable	Coefficient	Standard error	T-statistics	P-value
Livestockprodu~_1	36.2725	28.1486	1.289	0.2116
Cropproduction~_1	−100.625	55.7363	−1.805	0.0854 *
Foodproduction~_1	61.5845	29.0420	2.121	0.0460 **
CO2emmissions_1	−2.46922	10.8926	−0.2267	0.8229
Agriculturalra~_1	−2.71215	1.52740	−1.776	0.0903 *
Employmentinag~_1	6.35551	3.11171	2.042	0.0539 *
Ruralpopulatio~_1	−0.877114	0.873568	−1.004	0.3268
R-squared: 0.822357 F-statistic (7, 21): 19.68684 p-value (F): 6.79e-08 Akaike criterion: 146.8495 Schwarz criterion: 156.1749 Durbin-Watson statistic: 1.794889				
Note – Compiled by the author based on [12]				

Regression analysis indicated that complex relationships were established between various agricultural and environmental factors and the dependent variable, which are likely to represent an important aspect of agricultural production and environmental sustainability. Coefficients, standard errors, t-statistics and p-values for each independent variable were determined to determine their significance in predicting the dependent variable. In addition, a number of summary statistics were considered to comprehensively evaluate model performance, including the mean and standard deviation of the dependent variable, measures of model fit such as R-squared and F-statistics, and diagnostics such as the Durbin-Watson statistic.

The findings provide compelling insight into the interaction between agricultural sector dynamics and the broader economic climate. Notably, the variables crop production and agricultural employment were found to be statistically significant predictors of the dependent variable with coefficients of 61.5845 and 6.35551, respectively, and p-values of 0.0460 and 0. 0539.I in contrast, variables such as CO2 emissions and agricultural land showed less significant relationships with coefficients of -2.46922 and -2.71215 and p-values of 0.8229 and 0.0903, highlighting the complexity of environmental factors in farming systems.

In addition, a robust R-squared of 0.867765 indicates that a significant portion of the variance in the dependent variable can be explained by the selected independent variables, indicating the effectiveness of the model

in identifying key determinants of agricultural productivity. However, potential problems such as the presence of borderline significant variables and autocorrelation reflected in the Durbin-Watson statistic 1.794889 require further research and refinement of the model.

Given these findings, it is clear that agriculture has a significant impact on economic growth and overall national prosperity. Empirical evidence suggests that agriculture can make a significant contribution to GDP growth and economic development. It is therefore critical that policymakers pay due attention to the agricultural sector, recognizing its potential to stimulate economic activity, reduce poverty and promote sustainable development.

Policymakers in the agriculture sector of Kazakhstan should increase agricultural productivity, improve infrastructure and access to markets to promote sustainable farming practices. Moreover, they can maximize the potential of the agricultural sector as a catalyst for inclusive growth and prosperity.

This analysis highlights the critical importance of agriculture in shaping economic results and highlights the need for policymakers in Kazakhstan and beyond to prioritize agriculture on the policy agenda. By harnessing the transformative power of agriculture, policymakers can pave the way for sustainable economic growth and improved food security.

CONCLUSION

Kazakhstan's agricultural sector has untapped potential, but is underdeveloped and underfunded compared to its industrial sector. Kazakhstan's agricultural policy has been influenced by multifaceted diplomacy, particularly regionalism within the Eurasian Economic Union (EAEU) and China's Belt and Road Initiative (BRI). new opportunities for local producers, increased competition, especially from productive partners such as Russia, is a problem.

Participation in the BRI not only facilitates the transit of Chinese products, but also opens up opportunities for increasing the export of agricultural products to China. Kazakhstan plays a key role in this initiative and therefore can negotiate favorable conditions for the export of agricultural products if they meet global production standards.

To take advantage of these opportunities, Kazakhstan must bring its agricultural practices in line with international standards and anticipate demand in key markets such as the EU, Russia and China. This includes promoting free trade agreements (FTAs), harmonizing agricultural support within the EAEU and expanding agricultural services. Using regionalism can help create Eurasian value chains that combine the strengths of the EAEU member countries and neighboring Central Asian countries.

Other state-owned financial entities like the Fund for Financial Support of Agriculture JSC and the Kazakh Agrarian Credit Corporation provide microcredit and loans to SMEs and farmers. In June 2020, the World Bank approved a $500 million loan for a Sustainable Livestock Development Program, aiming to train farmers and improve infrastructure for sustainable livestock production, including a traceable beef production system. Key sub-sectors in agriculture include chemical products, grain machinery, seeds, livestock genetics, food processing, water-saving technologies, and aquaculture. American agricultural exports to Kazakhstan, particularly equipment like tractors and combines, have a strong reputation. Opportunities lie in machinery, grain storage, irrigation technologies, and veterinary services.

Additionally, there's a growing market for U.S. food imports like beef, poultry, almonds, and beverages. Fresh fruits and vegetables are major imports, mainly from Uzbekistan and China, highlighting potential trade opportunities.

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ҚАЗАҚСТАН ЭКОНОМИКАСЫНА АУЫЛ ШАРУАШЫЛЫҒЫ САЛАСЫНЫҢ ӘСЕРІН ЗЕРТТЕУ: ТЕНДЕНЦИЯЛАР, ҚИЫНДЫҚТАР МЕН МҮМКІНДІКТЕР

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АҢДАТПА

Зерттеу мақсаты. Ауыл шаруашылығына мемлекет экономикасының дамуына септігін тигізетін сала ретінде көзқарас тудырып, оның маңызын айқындап, көмірқышқыл газы шығарындыларының кем тұстарын көрсету зерттеу жұмысының негізгі мақсаты. Сонымен қатар аграрлық сектордағы мәселелерді шешу кезінде ауылдың тұрғындарын хабардар етудің маңыздылығы анықталған.

Әдіснамасы. Зерттеу жұмысында регрессиялық әдіс қолданылған. Бұл талдау шаруашылықтың айнымалылары мен жалпы ішкі өнімнің өсімі арасындағы тәуелділікті анықтауға бағытталады. Барлық мағлұматтар ҚР ресми статистикалық сайты мен Дүниежүзілік банктің ресми желісінен алынды. Регрессиялық талдау ауыл шаруашылығы секторының әртүрлі бір-біріне тәуелді емес айнымалылардан тұрады, ал жалпы ішкі өнім өсімінің қызметі – тәуелді айнымалы болу. Алынған нәтижелердің нақтылығын бекіту үшін статистикалық тәжірибелер, толық диагностика жүргізілген болатын.

Зерттеудің бірегейлігі / құндылығы. Мақалада авторлармен келтірілген жаңа дәлелдер ҚР экономикасының ауыл шаруашылық секторынан тәуелділігін айқын көрсетеді. Жұмыстың ерекшелігі – ауыл шаруашылық секторының басты проблемалары мен оны шешу жолдары ұсынылған, көмірқышқыл газының шығарындылары мен ауыл тұрғындарын жұмыспен қамту мәселелерін қарастыру зерттеу жұмысына ғылыми тұрғыда ерекше терең реңк береді.

Зерттеу нәтижелері. Жүргізілген регрессиялық талдау нәтижесінде ҚР-ның ЖІӨ өсуіне тікелей әсер ететін факторлар туралы деректер белгілі болды. Сонымен қатар, R-квадрат тәуелді айнымалыдағы дисперсияның едәуір бөлігін таңдалған тәуелсіз айнымалылармен түсіндіруге болатындығын көрсетеді, бұл модельдің ауылшаруашылық өнімділігінің негізгі детерминанттарын анықтаудағы тиімділігін көрсетеді. Зерттеу нәтижесінен байқағанымыздай, Қазақстанның ауыл шаруашылық секторы өнеркәсіп саласына қарағанда көп көңіл бөлуді қажет етеді. Жалпы ішкі өнімнің өсуі мен экономикалық өнімділікке осы сектор жауап береді. Бұл туралы эмпирикалық дәлелдер бар. Аграрлық саланың саясаты мен инвестицияларға қолдау білдіру арқылы кедейлікпен күресуге, ауыл халқын тұрақты түрде дамытуға көмек көрсетуге болады.

Түйін сөздер: ЖІӨ, ауыл шаруашылығы, экономикалық өсу, өндіріс индекстері, көмірқышқыл газы шығарындысы, жұмыспен қамту, регрессия.

ИЗУЧЕНИЕ ВЛИЯНИЯ СЕЛЬСКОХОЗЯЙСТВЕННОЙ ПРОМЫШЛЕННОСТИ НА ЭКОНОМИКУ КАЗАХСТАНА: ТЕНДЕНЦИИ, ВЫЗОВЫ И ВОЗМОЖНОСТИ

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АННОТАЦИЯ

Цель исследования. создать подход к сельскому хозяйству как отрасли, способствующей развитию экономики государства, определить его значение и показать недостатки выбросов углекислого газа. Также определена важность информирования жителей села при решении вопросов аграрного сектора.

Методология. В исследовательской работе использовался регрессионный метод. Этот анализ будет направлен на определение зависимости между переменными фермы и ростом валового внутреннего продукта. Все данные взяты с официального статистического сайта РК и официальной сети Всемирного банка. Регрессионный анализ состоит из различных взаимозависимых переменных сельскохозяйственного сектора, и функция роста валового внутреннего продукта заключается в том, чтобы быть зависимой переменной. Для утверждения достоверности полученных результатов были проведены статистические эксперименты, полная диагностика.

Оригинальность / ценность исследования. новые данные, представленные авторами в статье, наглядно демонстрируют зависимость экономики РК от сельскохозяйственного сектора. Специфика работы заключается в том, что представлены основные проблемы сельскохозяйственного сектора и пути их решения, рассмотрение вопросов выбросов углекислого газа и занятости сельского населения придает исследовательской работе особенно глубокий научный оттенок.

Результаты исследования. в результате проведенного регрессионного анализа стали известны данные о факторах, непосредственно влияющих на рост ВВП РК. Кроме того, R-квадрат показывает, что значительная часть дисперсии зависимой переменной может быть объяснена выбранными независимыми переменными, что указывает на эффективность модели в определении основных детерминант производительности сельского хозяйства. Как видно из результатов исследования, сельскохозяйственный сектор Казахстана требует большего внимания, чем промышленность. Этот сектор отвечает за рост валового внутреннего продукта и экономическую производительность. Есть эмпирические доказательства этого. Выражая поддержку политике аграрной отрасли и инвестициям, можно помочь в борьбе с бедностью, устойчивом развитии сельского населения.

Ключевые слова: ВВП, сельское хозяйство, экономический рост, индексы производства, выбросы углекислого газа, занятость, регрессия.

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