The Agricultural Factors Influencing the Economic Development of Kazakhstan

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Abstract

This article aims to identify the impact of factors of agriculture on the economic growth of Kazakhstan. The literature review analyzes the current state of the agricultural sector and indicates the role of Kazakh agriculture in the development of the economy in world. Using the SPSS program, a multiple regression analysis was performed to investigate the relationship between six independent variables and one dependent variable of economic growth expressed as GDP per capita. When constructing the regression, four factors were used, namely investments in agriculture, productivity, livestock of cattle and poultry, and gross output of agricultural services, in addition, the interest rate and the unemployment rate were also taken into account. Descriptive statistics for variables were taken from the Bureau of National Statistics from 2003 to 2021. Three hypotheses were put forward, and two were accepted on a 5% significance level. The third hypothesis was not rejected, and at the same time, there was no evidence to accept it either. According to the results, a small change in GDP per capita as an investment in agriculture and crop yield change by one unit. Also, the difference in a dependent variable while cattle and poultry livestock and gross output of agricultural services change by one unit were insignificant when $\alpha=0.05$. The government can use the results of the study to develop the economy from the perspective of agriculture.

Keywords: Economic Growth, Agriculture, Agricultural Factors, Strategy, Regression Analysis

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Қазақстанның экономикалық дамуына әсер ететін ауыл шаруашылығы факторлары

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Түйін

Бұл мақаланың мақсаты – Қазақстан экономикасының өсуіне ауыл шаруашылығы факторларының әсерін анықтау. Кіріспеде және әдебиеттерге шолуда Қазақстандағы ауыл шаруашылығы саласының қазіргі жағдайы және әлем экономикасының дамуындағы ауыл шаруашылығының рөлі талданды. SPSS бағдарламасында жан басына шаққандағы ЖІӨ ретінде көрсетілген экономикалық өсудің алты тәуелсіз айнымалы мен бір тәуелді айнымалы арасындағы қатынасты зерттеу үшін регрессиялық талдау жүргізілді. Ауыл шаруашылығының төрт факторы зерттелді, атап айтқанда ауыл шаруашылығына салынатын инвестициялар, дақылдардың өнімділігі, ірі қара мен құс басы, ауыл шаруашылығы қызметтерінің жалпы өнімі, ал қалған екі фактор пайыздық мөлшерлеме мен жұмыссыздық деңгейі. Бұл айнымалылар бойынша деректер Ұлттық статистика бюросынан 2003-2021 жылдар аралығында алынды. Үш гипотеза ұсынылды, оның екеуі 5% маңыздылық деңгейінде қабылданды. Үшінші гипотеза жоққа шығарылмады және сонымен бірге оны қабылдауға ешқандай дәлел болмады. Нәтижелерге сәйкес, ауыл шаруашылығына инвестиция және ауыл шаруашылығы дақылдарының өнімділігі бір бірлікке өзгергенде жан басына шаққандағы ЖІӨ-де шамалы өзгеріс болуы елеулі. Сондай-ақ, $\alpha=0,05$ кезінде ірі қара мал мен құс басы мен ауыл шаруашылығы қызметтерінің жалпы өнімі бір бірлікке өзгергендегі, тәуелді айнымалының өзгеруі болымсыз болып шықты. Зерттеу нәтижелерін үкімет ауыл шаруашылығы перспективасында экономиканы дамыту үшін пайдалана алады.

Түйін сөздер: экономикалық өсу, ауыл шаруашылығы, ауыл шаруашылығы факторлары, стратегиясы, регрессиялық талдау

Сельскохозяйственные факторы, влияющие на экономическое развитие Казахстана

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Аннотация

Целью данной статьи является определение влияния факторов сельского хозяйства на экономический рост Казахстана. В литературном обзоре проанализировано современное состояние аграрного сектора и указана роль казахстанского сельского хозяйства в развитии экономики в мире. На основе использования программы SPSS был проведен множественный регрессионный анализ для исследования связи между шестью независимыми переменными и одной зависимой переменной экономического роста, выраженного в виде ВВП на душу населения. При построении регрессии использовались четыре фактора, а именно инвестиции в сельское хозяйство, урожайность, поголовье крупного рогатого скота и птицы и валовой выпуск сельскохозяйственных услуг, дополнительно также были учтены процентная ставка и уровень безработицы. Описательная статистика для переменных была взяты из Бюро национальной статистики за период с 2003 по 2021 год. Были выдвинуты три гипотезы, две из них были приняты на уровне значимости 5%. Третья гипотеза не была отвергнута, в то же время не было и оснований для ее принятия. Согласно результатам, наблюдается небольшое изменение ВВП на душу населения при изменении инвестиций в сельское хозяйство и урожайности на одну единицу. Также изменение зависимой переменной при изменении поголовья крупного рогатого скота и птицы и валовой продукции сельскохозяйственных услуг на одну единицу было незначительным при α=0,05. Результаты исследования могут быть использованы правительством для развития экономики в перспективе сельского хозяйства.

Ключевые слова: экономический рост, сельское хозяйство, с сельскохозяйственные факторы, тратегия регрессионный анализ.

Introduction

The agro-industrial complex, namely agriculture, is one of the important sectors of the economy, which forms the country's food and economic security, as well as the labor and settlement potential of rural areas. The agriculture of Kazakhstan has good prospects for further development: the export positions of the oilseed and meat sectors are strengthening, and in terms of grain and flour, our country has quickly become one of the largest exporting countries in the world.

Even though, for the past 60 years, the share of agriculture in the GDP has drastically decreased globally agriculture sector still has a meaningful impact on economic growth. According to the World Bank statistics, agriculture influences global domestic product for 4.3%, while in some developing countries, it weighs 25% of GDP. Despite that, most developing countries are not paying proper attention to agricultural and rural development (Erh-Cheng Hwa), which leads to the standing of agriculture.

Kazakhstan has great potential for developing sustainable agriculture in the perspective of land, where 80% of the territory is characterized as agricultural land. However, the country`s GDP affected by agriculture is accounted for 5.1%, which could be higher if we use all our potential. Additionally, approximately 45% of the country's population lives in rural areas, where incomes of almost 30% of the economically active population are given by employment in the agricultural sector. This is one of the main sectors of the economy. Every year it provides almost 38% of income to the budget. Approximately 16% of the country's total labour force is employed in this industry. It should be emphasized that agriculture in Kazakhstan is in 2nd place in the world in terms of growing grains with indicators of 967 kg per 1 person. However, livestock productivity is very low, and this indicator of Kazakhstan is 142nd (World Bank, 2022).

Agriculture plays an essential but declining role in the economy of Kazakhstan. In 2020, the share of agriculture, forestry and fisheries was only 2.4% or 449 billion tenge. In general, in 2020, the percentage of the agro-industrial complex in the country's GDP amounted to only 5.1% (4.2 trillion tenge). Since 2010, the share of agriculture in the economy has stayed within 5%, which is lower than 6.4% in 2005 and 8.2% in 2000. Of the 8.5 million employed in the economy, about 1.4 million or 16%, are used in agriculture. In January-December 2021, the volume of gross agricultural output decreased by 2.4% and amounted to 7.4 trillion tenge. The

reason for the decline is the abnormal drought last year, due to which the volume of crop production decreased by 6.7% (4.2 trillion tenge), although the livestock sector achieved an increase of 3.6% (3.1 trillion tenge). Food production for the specified period increased by 1.9% and amounted to 2.2 trillion tenge (Bureau of National Statistics, 2022).

There is a steady trend of investment in the fixed capital of agriculture. Thus, the volume of investments in fixed capital of agriculture increased by 33.3% and amounted to 1.2 billion tenge in food production, increased by 3.1% and amounted to 114.4 billion tenge. Labour productivity per person employed in agriculture for nine months of 2021 amounted to 2,153.5 thousand tenge (Bureau of National Statistics, 2022).

The agriculture sector provided a third of the 1% GDP growth in 2020. It is noteworthy that even in the crisis year of 2009, when the economy seriously slowed down to 1.2%, without the contribution of agriculture, economic growth would have been close to zero. A large area with different climatic and soil characteristics determines the specialization of the regions. Thus, the northern areas traditionally develop grain production, where agriculture forms from 15% to 25% of the gross regional product. The southern regions are engaged in the cultivation of rice, fruits, and vegetables; the share of agriculture reaches 15%. The rest of the regions are predominantly involved in animal husbandry, with less than 10% of agriculture.

Because Kazakhstan is located in the zone of risky farming and, at the same time, uses predominantly outdated methods of agricultural management, there is extremely high volatility in production.

For example, the growth in gross agricultural output by 15% in 2009 was replaced by a decline of 12% in 2010, in 2011, the increase reached 27%, to subsequently fall by 18% in 2012. In 2016, thanks to relatively favourable climatic conditions and high harvests, agriculture grew by 5.5%, compared with 3.4% in 2015. In addition, in 2021, the volume of gross agricultural output decreased by 2.4% and amounted to 7.4 trillion tenge because of the drought.

The output in crop production is 39% formed by peasant and farm enterprises, 31% is provided by agricultural enterprises and 30% by households. Work in animal husbandry is 71% dependent on families, 15% is offered by peasant and farm enterprises, and agricultural enterprises account for 13%.

Thus, considering crop production, almost half of the agricultural production in Kazakhstan is produced by households, about 30% by peasant and farm enterprises, and a little more than 20% by agricultural enterprises.

The activities of households should rather be considered as a form of self-employment and as a source of additional income, primarily in kind. For example, the slaughter weight of cattle in households is 20% lower than that of agricultural enterprises, chickens' egg production is 80% lower, and milk yield is halved. This, in turn, explains the low performance of agriculture in general. At the same time, households need incentives (they produce mainly for their consumption) and opportunities (there are no agricultural techniques, knowledge, or finances) to increase productivity.

The share of exports of agricultural products in the total exports of the country amounted to 6%. The main export item of agri-food products is cereals, the export of which has brought in more than $1 billion per year on average over the past ten years, and together with the export of flour, the share of these products exceeds 60% of total exports.

Summarizing the above, we can conclude that agriculture positively affects the country's economy, and its development is one of the state's priorities. Therefore, there is a need to investigate the economic factors of agriculture that affect the economy's growth. To use them in the further development of the industry. The purpose of this research was to identify the impact of agriculture's economic factors on Kazakhstan's economic growth.

Literature review

Agriculture is another method of a country's economic development through economic factors. Regions with low industry development hinge on manual labour predominantly. Agriculture greatly contributes to economic growth, which is highly prominent in developing countries, employing half of the population in such states as India (Alston & Pardey, 2014). Notwithstanding, the process of agriculture development has different outcomes in themes of the contribution to GDP. For instance, according to Asom and Ijirshar (2020), agricultural value added does not contribute to economic growth in developing countries because the changes in GDP are insignificant. The role of agriculture is obviously reflected not only in its contribution to GDP but also in the complex interrelationships of how it affects rural life (Chernova et al., 2022).

Idiaye et al. (2014) concluded that agriculture has an insignificant direct influence on the saving capacity of the population in developing countries. However, they showed that to improve the saving capacity of the local people in developing countries, the government needs to increase the employment rate. Next, the population's income level must be improved as well, which could be achieved through on-time payments to workers, thus reducing delays (Idiaye et al., 2014). Therefore, agricultural development has in broader aspect indirect impact on economic growth. Moreover, increase in the employment rate and development of local production of goods has a significant impact on economy growth. An increase in the production rate has a significant impact through the rise of agricultural value added and leading to an open market strategy (Awan & Aslam, 2015; Hu et al., 2022). The development of agriculture is one of the critical priorities of governments, which is achieved through the development of skills and competences and support of small and medium businesses, especially in rural areas. For instance, the experience in African countries showed that government spending on providing knowledge distribution among the local population contributed to economic growth and poverty reduction. It is noteworthy that the main obstacle in providing agriicultural extension policy was centralized regulation by the state bodies. Such regulation, usually only considers the peculiarities of agriculture in different regions. Agricultural modernization is a key tool for eradicating rural poverty (Hilden et al., 2012; Berhanu & Poulton, 2014).

Another way of investing in agriculture, besides agricultural skills and competencies extension, is implementing a precision agriculture strategy. It is highly dependent on the development of information and communication technologies because it uses various technologies for data collection and processing. Wide usage of innovation technologies helps at an individual level, single farmers, and businesses (Pathak et al., 2019). Nevertheless, it should be taken into account the preferences of local populations. Sometimes, obtaining new skills and knowledge in agriculture is followed by a change of place of living, for further application of new skills caused by implementing innovations in agriculture. However, people are not always ready to move, which provides decline in the income rate in agriculture and a reduction in the labour f orce (Martin, 2019). State strategies in developing the agro-sector include providing access to

finance for the local population, that is, the issuance of loans under the state program. As the study by Mekhmonov and Ergashev (2019) showed, the state strategy for the development of the agricultural sector with the help of lending gives impetus to the development of regions, raising the income of the local population and creating new jobs.

Moreover, agriculture is another way to improve socio-economic situation in developing countries lacking industry and mostly depend on manual labour (Dercon & Gollin, 2014). Thus, agricultural development influences the development of the economy through achieving key goals such as providing food security, employment, increase in income, especially in domestic industry and market-ensuring with services and goods (Azam & Shafique, 2017).

Agriculture stands out as a seller and a buyer because it provides raw materials for industry, and at the same time, it consumes industrial products. Next, it contributes to the budget of a country through taxes. It should be noted that most count-ries' economies are comprised of small and medium agriculture businesses. In countries notorious for high unemployment with low industries, it acts as another way of employment provision for the population, thus providing cheap labour. Developing domestic enterprises in agriculture, especially, ensures growth in export (McArthur & McCord, 2017). Moreover, rapid agricultural growth accelerates economic transformation into a modern economy (John & Barrett, 2017)

Kurmanova et al. (2022), in a study on the factors of industrial production that led to an increase in emissions that agriculture in Kazakhstan is a matrix, and each of its cells covers production factors such as labour, land, capital, and entrepreneurship. Factors causing the technical and economic development of the agricultural industry. Nurmukhametov et al. (2022) found that the farm economy could become a priority sector in the overall structure of the national economy in the long term. The effectiveness of the activities of agribusiness entities in the conditions of developed competition justifies this.

Thus, we can conclude that agriculture has a significant influence on the economic growth of the country. The result of the following factors: investment in agriculture, crop yield, cattle and poultry livestock, the gross output of agricultural services, interest rate and the unemployment rate, the impact of which will be studied through multiple regression analysis in the following parts of the research.

Data and methodology

This section depicts the methodology and analysis of collecting data. The methodology was based on the provided literature review. In their studies, Petre and Ion (2019) verified a positive and medium impact of agricultural investments on economic growth in rural areas. Zvizdojevic and Vukotic (2015) determined that the value of agricultural production was explained by three factors: agrarian land the total area, investment in research and development of agriculture, and the total active agrarian population. Therefore, the model includes one dependent and six independent variables. GDP per capita was taken as an outcome variable and independent variables include investments in agriculture, crop yield, cattle and poultry livestock, the gross output of agricultural services, interest rate and unemployment rate during 2003-2021. The total active agricultural population variable was not included in the study due to the lack of data between 2003 and 2011. Table 1 shows the indicators and their measurements used in the study.

GDP, IA and SERV are measured in domestic currency (tenge), while CY and LIVE are measured in centner per hectare and thousands of heads, respectively. INT and UR are indicated in annual percentage (%).

For the provision of multiple regression analysis, SPSS software was used. Initially, the factor variables, such as the gross output of plant growth and gross output of animal husbandry, were taken as representative of agriculture factors. However, due to the high multicollinearity between variables, they were taken away from the study. Instead, it was taken crop yield and cattle and poultry livestock. Overall, the factors representing agriculture in this model are IA, CY, LIVE and SERV. The model of the research is the following:

GDP per capita = a + b1(IA) + b2(UR) + b3(INT) + b4(CY) + b5(LIVE) + b6(SERV) + u For i=1... 19 years

Table 1 - Variables and measurements of the study

No.	Abbreviation	Description	Unit measurements	Sources
		Dependent variables		
1	GDP per capita	Gross domestic product per capita	thousand tenge	Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan
		Independent variables		
2	IA	Investment in agriculture	mln tenge	Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan
3	CY	Crop yield	centner per hectare	
4	LIVE	Cattle and poultry livestock	thousand heads	
5	SERV	Gross output of agricultural services	mln tenge	
6	INT	Interest rate	annual %	National Bank and Uchet.kz portal
7	UR	Unemployment rate	annual%	Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan
8	u	Measurement error	-	

Note: Compiled by the authors

The purpose of multiple regression (term used by Pearson, 1908) is to highlight the relationship between a dependent variable and various independent variables. Therefore, it was analyzed the impact of factors of agriculture on GDP per capita. For further understanding, there are four factors of agriculture in our model investments in agriculture, crop yield, livestock, and gross output of agricultural services. The aim of this study is to identify how well the agriculture variables can explain the country's economic growth, which is expressed as GDP per capita, and to what extent those variables can explain the change in the dependent variable. Based on relevant studies and the aim of this study, we can form several hypotheses:

I. **H0**: *Investments in agriculture have no impact on economic growth.*
H1: *Investments in agriculture have a positive impact on economic growth.*

II. **H0**: *An increase in crop yield has no impact on economic growth.*
H1: *An increase in crop yield has a positive impact on economic growth.*
III. **H0**: *An increase in cattle and poultry livestock has no impact on economic growth.*

H1: *An increase in cattle and poultry livestock has a positive impact on economic growth.*

Analysis
This study used data from 18 years between 2003 and 2021. Table 2 presents indicators and data sets for the given period.

As can be seen from the table, GDP per capita, investments in agriculture and gross output of services in the field of agriculture were steadily growing over the period. Meanwhile, crop yield and cattle and poultry livestock also grew throughout the period. However, there was a slight decrease in 2014 and 2021 in crop yields and in livestock there was a period of fall in their number from 2011 to 2012. The unemployment rate had a downward trend reaching down to 4,9%. We can also see that interest rates fluctuated around 9%, however in the period of global crisis in 2007-2008 and in 2015-2017 when tenge/dollar value sharpened, interest rates were at their high level. Dynamics of investments in agriculture, crop yield and cattle and poultry livestock are presented in Figure 1, Figure 2, and Figure 3, respectively.

Table 2 - Indicators and data set

Year	GDP per capita	IA	UR	INT	SERV	CY	LIVE
2003	309,3	25 123	8,8	7	2 361,1	695,6	19 690,9
2004	391,0	44 110	8,4	7	3 835,7	691,5	21 176,8
2005	501,1	49 030	8,1	8	3 764,9	737,8	22 394,0
2006	667,2	44 059	7,8	9	4 344,9	786,7	23 718,0
2007	820,0	52 647	7,3	11	4 715,7	813,8	24 737,4
2008	1 024,1	73 587	6,6	10,5	5 652,0	730,6	25 658,2
2009	1 056,8	77 544	6,6	7	5 872,8	747,5	26 418,1
2010	1 336,5	83 586	5,77	7	5 871,7	726,1	27 238,1
2011	1 705,7	109 424	5,39	7,5	6 463,6	792,6	26 812,0
2012	1 847,0	133 945	5,29	5,5	6 664,7	795,5	26 239,4
2013	2 113,1	139 627	5,2	5,5	8 761,9	929,9	26 313,7
2014	2 294,9	173 281	5,06	5,9	10 479,7	911,2	26 970,8
2015	2 330,5	163 907	4,93	16	11 849,8	913,2	27 363,4
2016	2 639,7	253 691	4,96	12	15 271,1	979,7	27 907,8
2017	3 014,7	348 481	4,9	10,25	10 835,8	979,8	28 556,0
2018	3 382,5	365 001	4,85	9,25	12 145,6	1017,9	29 547,2
2019	3 755,0	494 976	4,8	9,25	14 005,7	1055	30 519,0
2020	3 766,8	565 369	4,89	9	9 897,9	1068,2	32 135,2
2021	4 418,2	772 475	4,9	9,75	11 223,4	1033,3	33 626,3

Note: Compiled by the authors from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan
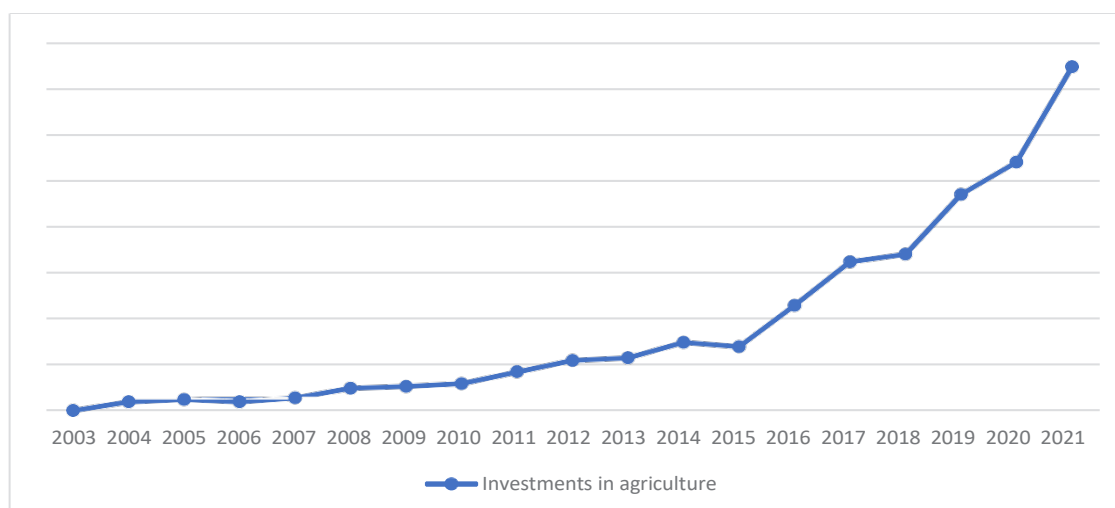
Figure 1 - Investments in agriculture from 2003 to 2021

Note: Bureau of National Statistics (2022)

Investments in agriculture had a gradual and slow growth until 2014, with an unexpected fall in 2015 of about ten thousand million tenge. However, from 2016 till 2020 investments in agriculture increased at a higher rate reaching 565 369 000 tenge. Finally, the rise was very sharp for one year it reached 772 475 000 tenge.

Crop yields were rising in 2007 until it fell by more than 80 centners per hectare. After that trend fluctuated for several years at around 730-740 centners per hectare then sharpening to about 930 centners per hectare in 2013. The trend then was with an upward slope till 2020 with a slight fall in 2014. In 2021 crop yields decreased from 1068,2 to 1033,8 centners per hectare.
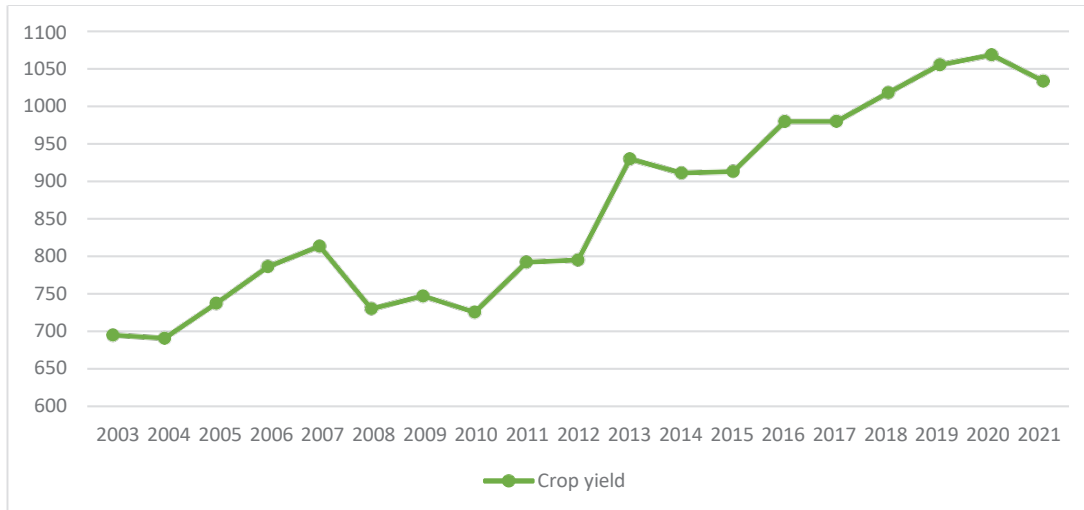

Figure 2 - Crop yield from 2003 to 2021
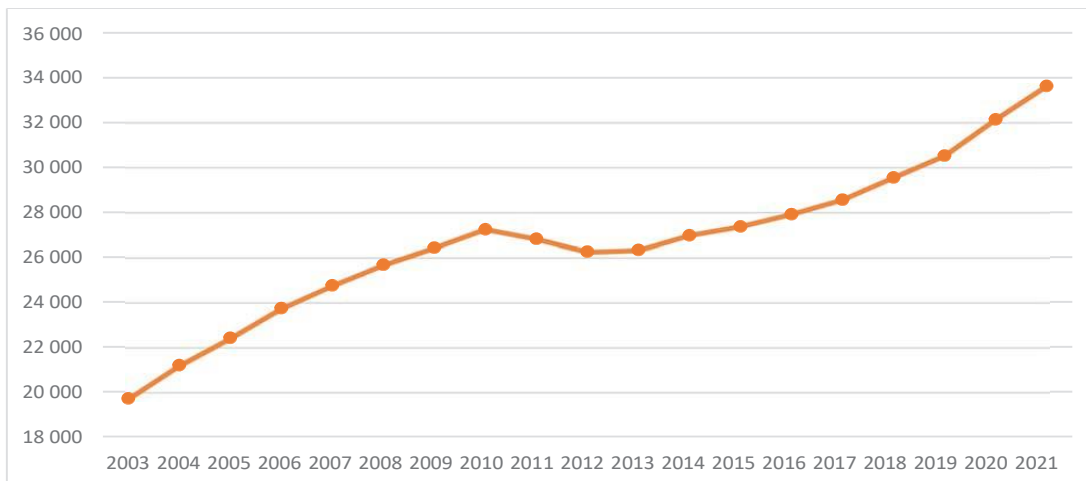
Note: Bureau of National Statistics (2022)

Figure 3 - Cattle and poultry livestock from 2003 to 2021

Note: Bureau of National Statistics (2022)

Cattle and poultry livestock had an upward trend overall reaching 33 626 heads in 2021. However, its number fell twice over the period in 2011 and 2012 to about a thousand heads in two years.

Results

The study investigates the relationship between factors of agriculture and economic growth using SPSS software. The results of the regression model are presented in Table 3.

The R squared of the model is 0,998 meaning that our specified independent variables explain GDP per capita for 99%. Table 4 shows the results of the ANOVA test.

Well-explained dependent variable confirms the sum of squares regression is greater than the sum of the squared residuals as presented in the table. The results of the regression equation are presented in Table 5.

Table 3 - Model summary

Model	R	R squared	Adjusted R square	St. error of the estimate	Observations
1	0,999	0,997	0,996	84,784	19

Table 4 - ANOVA test

Model	Sum of squares	df	Mean Squares	F	Sig. F
Regression	28756534,7	6	4792755,79	666,743248	1,9932E-14
Residual	86259,695	12	7188,30794		
Total	28842794,4	18			
a. Dependent variable: GDP per capita b. Predictors: Investment in agriculture, crop yield, cattle and poultry livestock, the gross output of agricultural services, interest rate and the unemployment rate					

Table 5 - Regression equation

Variables	Coef.	St. error	t-stat	p-value
Y-intercept	3403,16183	1051,65182	3,23601571	0,0071392
IA	0,00375347	0,00033327	11,2626097	9,7707E-08
UR	-382,29493	55,4707814	-6,8918252	1,6702E-05
INT	-3,3978503	9,9752211	-0,3406291	0,739272
CY	1,71956456	0,49005811	3,50889927	0,00431064
LIVE	-0,0553511	0,02562461	-2,1600752	0,05170435
SERV	0,01311496	0,01685661	0,77803083	0,45161891

The coefficients of agriculture factors from the second column can be interpreted as follows:

- Increase of investments in agriculture by one unit leads to an increase of GDP per capita by 3 tenge per person.

- Increase of crop yields by one centner per hectare leads to an increase of GDP per capita by 1720 tenge per person.

P-values evaluate how well the sample data support the argument that the null hypothesis is true meaning that in our model the variables of investments in agriculture, unemployment rate, and crop yields are significant on a 5% significance level. The variable of livestock is significant only at a 10% significance level. Therefore, the following results are formed:

I. **H0***: Investments in agriculture have no impact on economic growth – rejected.*

H1*: Investments in agriculture have a positive impact on economic growth – accepted.*

II. **H0***: An increase in crop yield has no impact on economic growth – rejected.*

H1*: Increase in crop yield has a positive impact on economic growth – accepted.*

III. **H0***: An increase cattle and poultry livestock has no impact on economic growth – not rejected.*

H1*: An increase in cattle and poultry livestock has a positive impact on economic growth – there is no strong evidence to accept.*

The aim of the study was obtained, and it was found that the model can explain the economic growth of the country for 99% and 2 out of 4 agricultural factors are significant, one is significant on a 10% significance level and the gross output of agricultural services is insignificant.

Additionally, the p-value of SERV is insignificant meaning that our model can be analyzed without this variable. The results of the regression model without the SERV variable are presented in Table 6.

Table 6 - Model summary without SERV

Model	R	R squared	Adjusted R square	St. error of the estimate	Observations
1	0,998	0,997	0,996	83,487	19

Adjusted R square stayed mostly the same, it means that the gross output of agricultural services did not make the previous model better. This research is limited by given years, variables and by this country.

Conclusion

The study aimed to determine how well the agricultural factors can explain the country's economic growth and to what extent those factors can explain the change in the dependent variable. For this purpose, regression analysis was provided with one dependent and six independent variables for 19 years. The data was taken from the Bureau of National Statistics of the Agency for Strategic Planning and Reforms of the Republic of Kazakhstan, the National Bank and from Uchet.kz portal.

Two hypotheses out of three were accepted, where the p-values of investments in agriculture and crop yields were significant on the 5% significance level. The result clearly shows that those two variables positively impact economic growth, expressed as GDP per capita. The third hypothesis was insignificant to accept it on α=0.05, also hypothesis was not rejected. R-squared was equal to 0,99, presenting that much of the variability in the regression was explained by this model.

Provided statistical analysis showed that there was a small change in GDP per capita while investments in agriculture and crop yields change by one unit. Thus, identified deliberate changes have an impact even small, on economic growth. Therefore, it can be used by the government to improve economic development from the perspective of agriculture.

The findings in this research may be used to develop a strategy in financing agriculture for the further prospering of this sector. Moreover, the agricultural economy could become a much significant sector in the structure of the national economy of Kazakhstan in the long term since it has its perspectives.

The limitation of the study is that the model still can be optimized. This study used materials that was available for researchers, however in a follow-up study, we can adopt a variety of research methods to test the effectiveness and impact of agriculture sector on economic growth.

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