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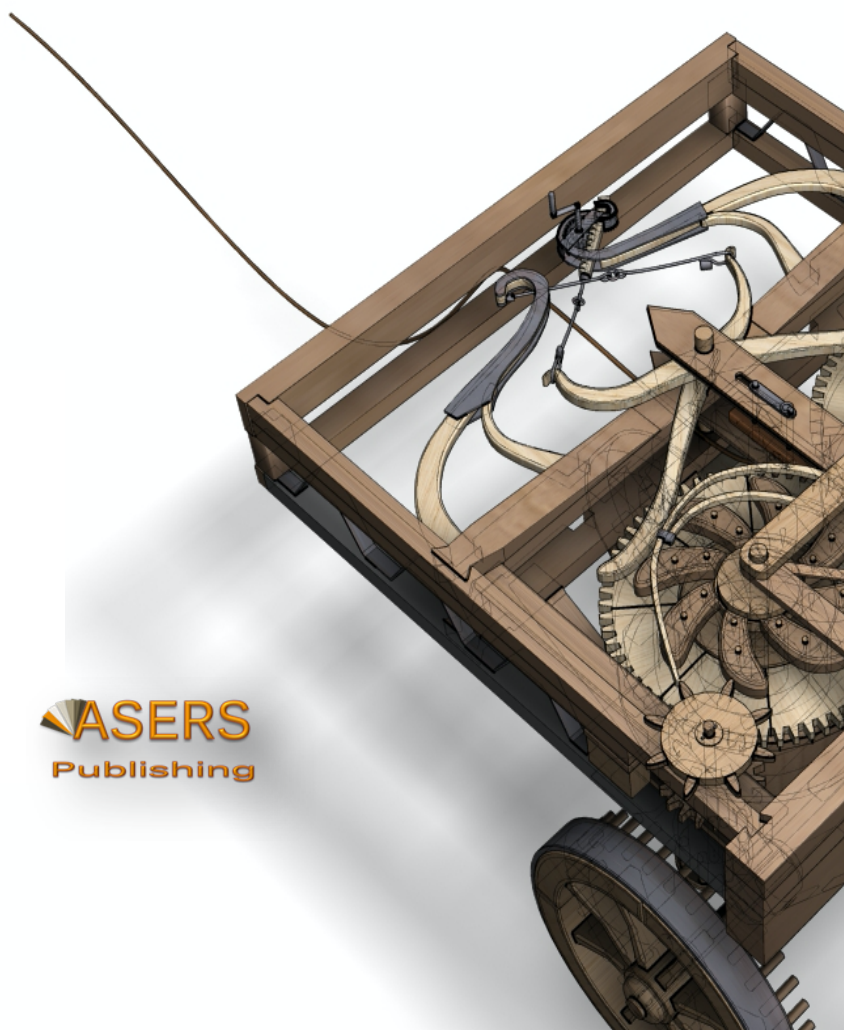
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Journal of Environmental Management and Tourism is an interdisciplinary research journal, aimed to publish articles and original research papers that should contribute to the development of both experimental and theoretical nature in the field of Environmental Management and Tourism Sciences.

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Investments as a Factor of Sustainable Development of Rural Areas

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Abstract:

Sustainable development of agriculture depends heavily on the efficient utilization of all production factors, such as a reinforcement of physical infrastructure, application of science and technology, industry investment, and innovations. Agriculture plays a key role in the Kazakh economy and its sustainable development defines the country's economic and political position. Therefore, agriculture has a complex strategic value, and activation of investments and innovations is a defining factor for the sustainable development of agriculture. The purpose of the study is to research the investment as a source and develop proposals to increase the investment for the sustainability of agriculture. The "Data Analysis" package was used for the study in a combination with methods of logical and statistical analysis. The calculations show that the combined impact of factors leads to an increased capacity for sustainable development of rural areas. The expected research results may vary and depend on the stakeholders' interests. The proposed model will contribute to investment attractiveness, reinforcement of the investment activity and practical investment to agriculture, a high-quality design of investment projects, and personal interest of each agricultural producer in the results of their actions. Altogether, this will provide a significant increase in the economic efficiency of the industry.

Keywords: investment; innovation; agriculture; analysis; indicators; variables; labor productivity.

JEL Classification: O18; R20; Q01; R11.

Introduction

Sustainable development of agriculture is one of the key strategic goals of public policy the achievement of which will ensure food security, strengthen the competitiveness of the agricultural economy and the well-being of citizens.

Lately, various state programs aimed at the social and economic development of agriculture have been implemented, related reforms have been carried out, however, the analysis shows the weakness of our agricultural sector and its high vulnerability to destructive global trends.

At the present time, many rural territories have faced a crisis which manifested a deterioration of demographic problems, lower life standard of rural residents, high unemployment, and irrational disposal of natural resources which affected negatively their sustainable development. For this reason, the problem of sustainable agriculture development has been emerging.

Theoretically, the ideas of sustainable development have been the focus of study for various branches of science for a long time. Sustainability appears as a systemic quality and can be considered from political, economic, social, demographic, environmental, and other perspectives.

1. Theoretical Aspects of the Study Subject

The concept of “sustainability” in the study of socio-economic systems should be studied as a fundamental concept that reflects one of the most significant phenomena for society concerning the process of reproduction of material goods, its quantitative and qualitative aspects (Vinogradov 1985; D'Amato, Korhonen, Toppinen 2019).

The definition of sustainable development of rural areas let us draw a conclusion that it is based on stable social-economic development, as well as enabling the renewable production with efficient use of all resources, increasing the living standard of people, building a favorable demographic and ecological environment.

In our opinion, the most acceptable definition of it is as follows. The sustainable development of rural areas is a purposeful process of viable development of agriculture, enabling economically feasible continuous production, increasing the standard of life quality for rural citizens, preserving natural resources, historical, cultural, and moral potential of rural territory.

As a result, summarizing approaches, considered above we specified the definition of sustainable development of rural areas. Therefore, sustainable development of rural areas is a purposeful process of stable development of rural areas, which is characterized by social, economic, and ecological conditions targeted to attract investments, use innovations, and develop financial and investment strategies leading up to increasing life standards for rural dwellers.

The development of a rural area, targeted to increase the life standard for rural dwellers is the key factor to support the sustainable growth of agriculture production, and facilitate social stability of area. Agriculture as the main branch of a rustic economy is the essential source of demand for workforce and income in rural places. Thereby its efficiency affects directly economic, social and demographic processes in a rustic territory and conservation of territorial and cultural integrity of the area (Ivolga and Uryadova 2010, 120).

From technological perspective resource-saving technologies, newly designed agricultural machinery and equipment, biotechnology for protection of plants and soil, acceptable for intensive production technologies, computerization, and automation of fattening, production, and processing of animal products will get paramount value (Martirosyan *et al.* 2022).

Agricultural machinery security is the emerging issue to implement Conception of sustainable development and increase competitiveness. To face it, it is necessary to develop equipment that meets the local conditions of agriculture, animal breeding, use the integrated technologies of consuming energy sources for agricultural production.

2. Research Methodology and Practical Application

To conduct the study and identify the amount of investment for agriculture production we analyzed agriculture of the Akmola region and considered it worth to start from description of the area.

Akmola region is located in Northern Kazakhstan. The capital of Kazakhstan, the city Nur-Sultan is in the center of the region, but it does not belong to it administratively. Akmola region is positioned in the central part of the country. The administrative center of the region is city Kokshetau, founded in 1824.

Geography and climate. The topography of the territory is diverse: most of it is occupied by steppes, small hills, poorly dissected plains and river valleys, mountains covered with forests. The climate of the region is extremely dry. Summer is short and warm; winter is long, frosty, with strong winds and blizzards. The main climate-forming factor is the sunshine, the maximum of which falls in June and July. The minimum air temperature is above minus 40°C, while the maximum reaches plus 44°C. The average annual precipitation is 265 mm and the annual wind speed is 5.3 m per sec.

The vegetation is represented by steppe species of various grasses and, accordingly, landscapes, especially in the northern part of the region, pine-birch forests, mixed-grass vegetation that covers the slopes of the mountains. Mountain pine forests are the wealth of the region.

The animal world of the region is characterized by considerable richness and diversity: 55 species of mammals, 180 species of birds, 30 species of fish, and other species. There are such species of animals as elk, roe deer, wolf, fox, squirrel, hare, muskrat, and groundhog. Kokshetau, Burabay and Korgalzhyn state national parks are positioned in this region.

Water sources. Several rivers flow through the territory of the region, among them, the largest are Ishim and Chaglinka. The Vyacheslav reservoir (410 million cubic meters) on the Ishim River and the Seletinsky reservoir (230 million cubic meters) on the Selety river were built for water supply. Shchuchinsko-Borovsky district of the region is rich in lakes. These are mainly fresh and slightly saline lakes. There are also healing lakes called Maybalyk and Balpashsor.

Akmola region is the one with developed agricultural production. The main specialization is grain production. The region is the leading by production and procession of food.

Agricultural production is one of the primary branches of national economy. It produces a quarter of national amount of a high quality of wheat. There is a capacity and potential for launching the food processing. Agribusiness is advanced to support the implementation of State program of agricultural development and State Program of rural development (State Program for the development of the agro-industrial complex of the Republic of Kazakhstan 2018).

As one of the largest agricultural regions, Akmola oblast holds a strong position to develop agribusiness and food processing due to one of the competitive advantages, which is a location in proximity to capital of the country.

One of the main objectives is the formation of a food belt in order to supply the capital's residents and businesses with quality food, get the position of the big suppliers for the main city and surrounding territory. There are all regions of the country involved in this program.

Such projects are directed to build feeding lots, considerable size dairy farms with a full start-end circle of milk processing. For instance, there are a large dairy farm "Esil Agro" LLC with 1200 cattle, a feeding lot for 5 K heads in "Ak bas" LLC (Shchuchinsk district), and "Kazger" LLC (Enbekshilder district) of Akmola region with newly established poultry farm. Additionally, a meat processing complex with a load capacity of 10 tons for a work shift was put into operation in Shchuchinsk district.

In order to develop sustainable agriculture, the operation for further consolidation of agricultural enterprises and their specialization has been performing, which in turn demands innovations and updating material infrastructure, mostly by the import of high-performance machinery abroad. To do so, the oblast is interested highly to find foreign investors.

3.Results

To do thorough research and get a vision how the region is developed we find it worth considering population and administrative and territorial mapping (Table 1).

Table 1. Administrative-territorial division and population of the Akmola region

	2014	2015	2016	2017	2018	2019	2020	2021
Districts	17	17	17	17	17	17	17	17
Cities	10	10	10	10	10	10	10	11
at oblast level	2	2	2	2	2	2	2	3
at district level	8	8	8	8	8	8	8	8
township	5	5	5	5	5	5	5	5
villages	614	614	607	606	602	590	590	589
Population, 000								
people, including	736.6	744.4	739.4	738.9	738.6	736.8	736.7	735.5
city	347.4	351.2	350	348.7	348.3	348.1	348.1	349.3
rural	389.2	393.2	389.4	390.3	390.3	388.6	388.6	386.2
% of rural in total	52.8	52.8	52.7	52.8	52.8	52.8	52.8	52.5

Note: compiled by the author source (Department of the Bureau of National Statistics for Akmola region 2021d; Ministry of National Economy of the Republic of Kazakhstan. Committee on Statistics n.d; Department of the Bureau of National Statistics for Akmola region 2022a)

As can be seen from Table 1, the Akmola region consists of 17 rural districts, 2 cities under oblast supervision (Kokshetau and Stepnogorsk), 8 towns under district supervision (Akkol, Atbasar, Derzhavinsk, Yerementau, Yesil, Makinsk, Stepnyak, Shchuchinsk), 5 townships and 194 rural counties. In dynamics, the number of villages has been decreasing from 614 to 589 in comparison with the beginning of the study.

A considerable share of the population is rural (52.8%). In general, the population has been declining, both rural and city.

The territory of the Akmola region is 146.2 thousand km, which is equal to 5.4% of the country's land size. The population at the end of 2021 was 735.5 K people, including city (47.5% or 340.3 K) and rural (52.5% or 386.2 K) residents. The density of population on average was 5, 1 people per 1 square km.

Both, agribusiness (including food production and food processing) and the sustainable development of rural areas are important sectors for the national economy, employment, and the environment.

And this is becoming increasingly important simultaneously with globalization elevating the world economy and increasing competition between national economies. The increase in the share of the urban population and the differences in the standard of living between the rural and urban populations are factors that determine the importance of a clear understanding of the state and prospects for the development of national agriculture and rural areas (Damu Entrepreneurship Development Fund 2019).

SWOT analysis of the Akmola region's agriculture is presented below.

Table 2. SWOT analysis of the Akmola region's agriculture

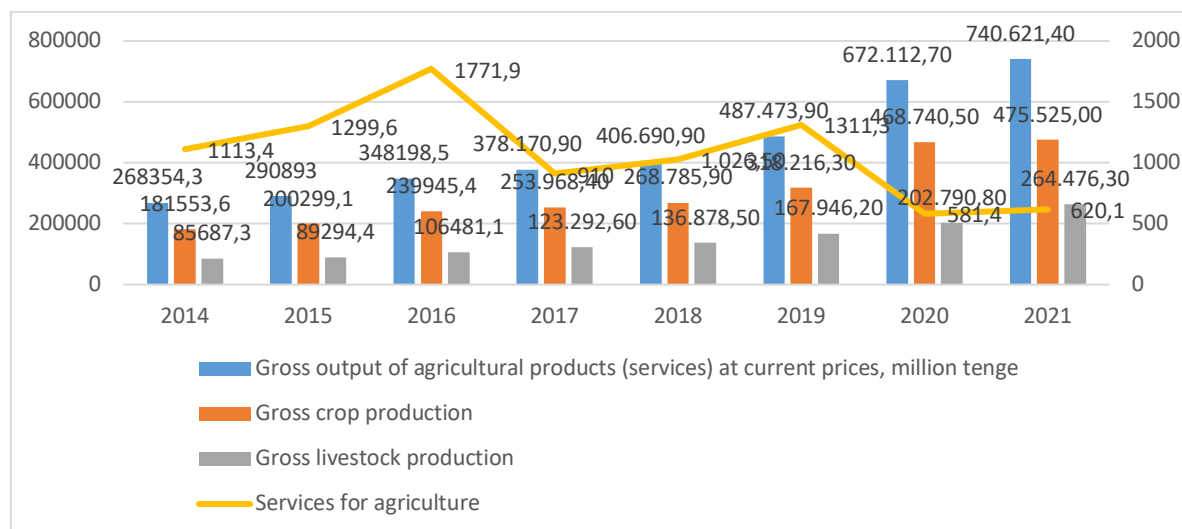
Strengths: proximity to the capital and location at the intersection of the main transit corridors; growth of transit flows along transport corridors; the largest exporter of grain and flour; large rural population (52.8% of the total population); * stable growth of the gross agricultural product.	Weaknesses: low competitiveness of produced food; low rates of renewal of fixed assets; lack of qualified personnel; shortcomings in the production and technical base for the storage, packaging, processing of food; undeveloped production infrastructure; high degree of physical wear of equipment and technologies; *a narrow range of produced food; lack of high-tech industries; *undeveloped trade, particularly export *low level of innovations *insufficient level of vet and food safety *climate dependence *low labor productivity
Opportunities *Undergoing significantly large investment projects under the framework of food security program for oblast's population and building food belt around Nur-Sultan city which favors the development of agribusiness *Establishing high-tech production *Possibility to increase food production to satisfy the increasing population of the capital and changes in food consumption *Development of efficient state support for agricultural producers and cooperatives *Diversifying supply geography and grain export volume	Threats *Adverse climate changes, instability of weather conditions; Spread of animal and plant diseases and environmental pollution Increased competition in international markets for certain types of products due to joining the WTO; *Risk of inefficient state regulation of the industry; *Lack or unavailability of investments to agriculture due to unfavorable conditions for business and investments increased urbanization

Note: compiled by the author source (Department of the Bureau of National Statistics for Akmola region 2021a)

Drawbacks considered above and threats to agriculture to a certain degree weaken the current position of agriculture and could failure sustainable and harmonious development of agriculture and rural areas. That is why central attention should be paid to build a sustainable model of agriculture, its infrastructure, and pleasant living conditions for rural residents.

The main economic indicators of agriculture in the Akmola region are presented in Figure 1.

Figure 1. Dynamics of the main indicators of agriculture of the Akmola region



Note: compiled by the author source (Department of the Bureau of National Statistics for Akmola region 2021a; Department of the Bureau of National Statistics for Akmola region, 2022)

Gross output is increasing over the time given, both for livestock and plant production. In relation to services for agriculture in 2017 and 2021, they plunged significantly. The highest increase in agricultural production was in plant production, with a share of almost 64.0%. However, the share of livestock accounted for 36.0%.

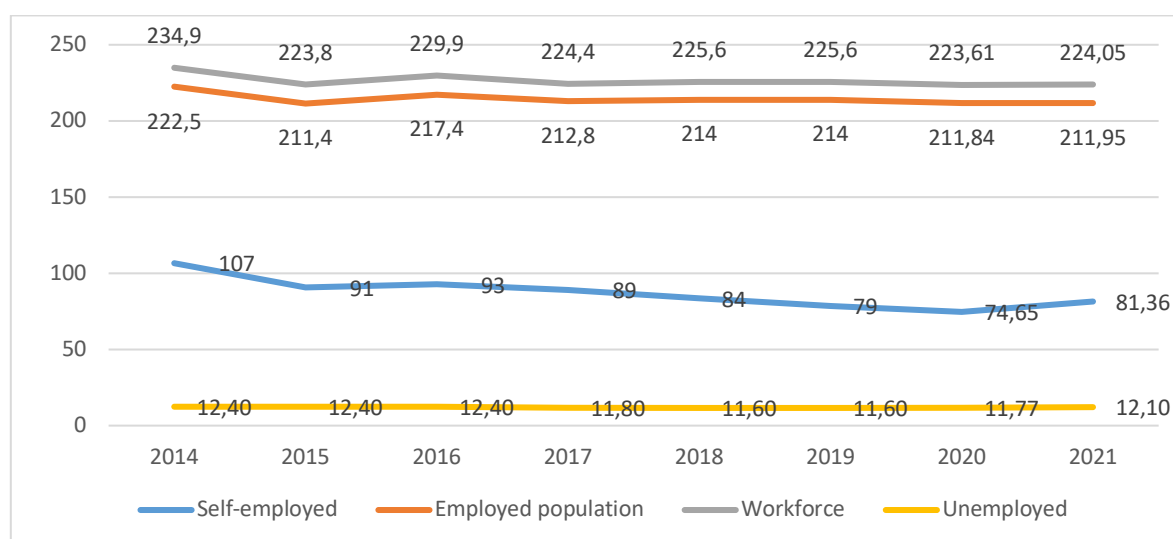
Creating a favorable environment for the sustainable development of the national economy, including its agricultural sector, is one of the most important priorities of state policy, which determines the key directions for the effective use of the existing potential of agriculture.

Sustainable development of agriculture proposes balanced social- oriented, economically efficient, and environmentally protected functioning of agribusiness. In addition, the formation of required conditions for rural citizens' life, making their lifestyle attractive and prestigious, ensuring the established standard for a rural population can be possible by achieving the social sustainability of agriculture, level of which can be determined by quantitative and qualitative characteristics of the workforce, development of rural areas.

The central factor for the effective and stable operation of agriculture is the highly qualified human resources supply.

The labor resource supply in agriculture of the Akmola region for the period 2014-2021 is represented in Figure 2.

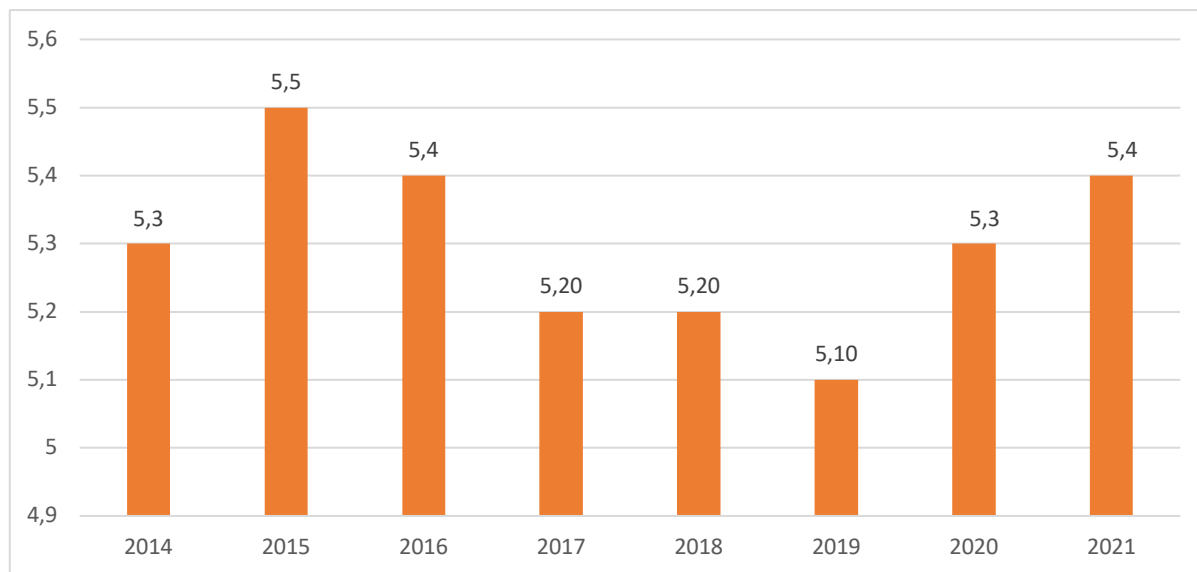
Figure 2. Workforce market



Note: compiled by the author source (Department of the Bureau of National Statistics for Akmola region 2021b; Department of the Bureau of National Statistics for Akmola region, 2022a)

The number of employed has plummeted by 10.85 K people in 2021 since 2014. Employed workforce was accounted for 200 K, while unemployed was only 12.1 K.

Figure 3. Dynamics of the unemployment rate of the rural population, %



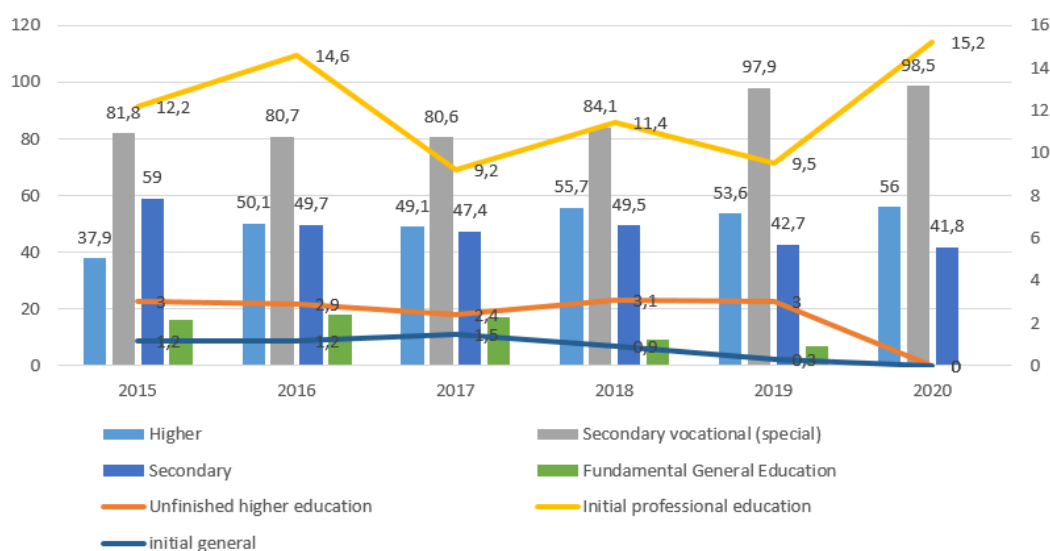
Note: compiled by the author source (Department of the Bureau of National Statistics for Akmola region 2021b, 2022a)

The unemployment rate has been decreasing for the 2016-2019 years of the given period. Compared to the data of 2015, it decreased by 0.4%, which is a positive factor in the development of the rural labor market. But in 2021, this indicator increased by 0.3% compared to 2019. This increase was due to the COVID-19 pandemic, which entailed an economic, social and human crisis.

The main qualification criteria for labor are education and field experience.

The qualifications, professional literacy, and education of the predominant part of agricultural workers, including managers and specialists of organizations, are insufficient, and the qualifications and professional expertise of personnel are even weakening, which indicates that their existing training does not match (Gusakov 2011).

Figure 4. Dynamics of the employed population by level of education, thousand people



Note: compiled by the author source (Department of the Bureau of National Statistics for Akmola region. 2021b)

As we noted above, the number of employed has been annually declining within all education levels besides vocational. The number of employed people with higher education is also decreasing and accounted for 15.02%. However, over the past year, there has been an increase in the number of employed people with higher,

secondary vocational education. Employment in agriculture still remains unattractive due to low salaries, the young generation does not stay, and migration from villages to the city continues.

In addition, there is an unacceptably frequent turnover of personnel. There are areas where farm managers work on average for no more than one or two years. With such changeability, it is impossible to carry out a long-term agricultural policy aimed at a steady increase in production efficiency (Gusakov 2008).

It is worth mentioning that agriculture is the primary subject of the social environment whereas the income of rural residents directly correlates and depends on the efficiency of their economic activity.

Fair work remuneration is considered not only as a priority for ensuring the reproduction of the labor force, but also as a factor of motivation, thanks to which the quality of the labor force as a whole increases and higher human needs development (Gusakov 2008).

Table 3. Dynamics of the main indicators of labor and investment

Years	Gross output of agricultural products (services) at current prices, million tenge	Labor productivity, million tenge/thousand people	Average monthly nominal salary of employees, tenge	Investments in fixed assets, million tenge
2015	290893,2	739,81	71334	24 762
2016	348198,5	894,19	90 683	51 633
2017	378170,9	968,92	102 133	33 699
2018	406690,9	1042,00	111 225	34 868
2019	487473,9	1254,44	130 586	51 966
2020	672112,6	1729,6	148 903	63838
2021	740621,4	1927,20	176775	102335

Note: compiled by the author source (Department of the Bureau of National Statistics for Akmola region 2021a, 2021b, 2021c, 2021e, 2022b)

From the data above it can be seen that work productivity and average monthly nominal salary increase from a year to a year, as well as gross output. In 2021 in comparison to 2015 growth rates were 154.6%, 160.5%, 147.8% respectively. Investments in fixed assets of agriculture fluctuate during this period, but in 2020 this indicator accounted for 102335 million tenge.

Next, we calculate the relations between these indicators using the correlation coefficient. (see table 4)

Table 4. Results of correlation

	Column 1	Column 2	Column 3	Column 4
Column 1	1			
Column 2	0,99992361	1		
Column 3	0,977022054	0,978041298	1	
Column 4	0,894760784	0,899643731	0,893269931	1

Based on the calculations, it can be seen that the relation between the indicators is very high.

Using the "Data Analysis" package, regression analysis was conducted and correlations between the indicators were calculated. The calculation result is presented in Table 5 below.

Table 5. Results of correlation

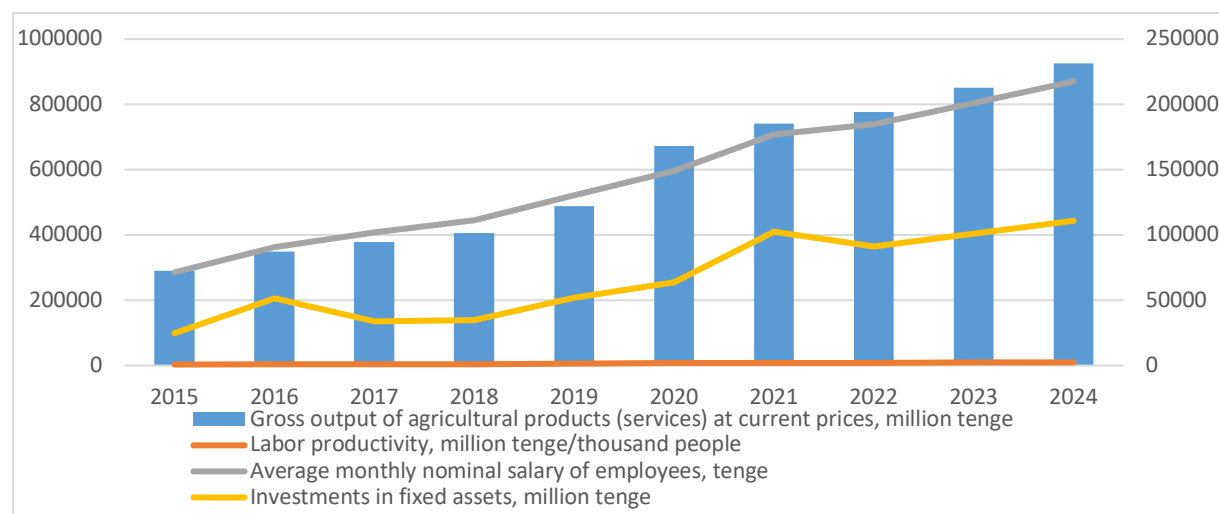
Regression statistics	
Multiple R	0,999988729
R-square	0,999977458
Normalized R-square	0,999954916
Standard error	1142,053055
Observations	7

The correlation results indicate a high correlation between the selected indicators.

On the basis of regression equation $Y_x = 8128.50 + 395.15x_1 - 0.067x_2 - 0.159x_3$ the following conclusions can be drawn: with an increase in labor productivity, gross agricultural output estimated to increase by 395.15 million tenge, while with a decrease in average monthly nominal wages and investments in fixed assets, gross output can decrease by 0.067 and 0.159 million tenge.

Further, using the results of the regression analysis, we calculated the forecast values of the indicators until 2024.

Figure 5. Forecast values for calculating the impact of investment on the main indicators of agriculture.



Note: compiled by the author source (Agency for Strategic Planning and Reforms of the Republic of Kazakhstan 2021; Department of the Bureau of National Statistics for Akmola region 2021a, 2021b, 2021c, 2021e, 2022b)

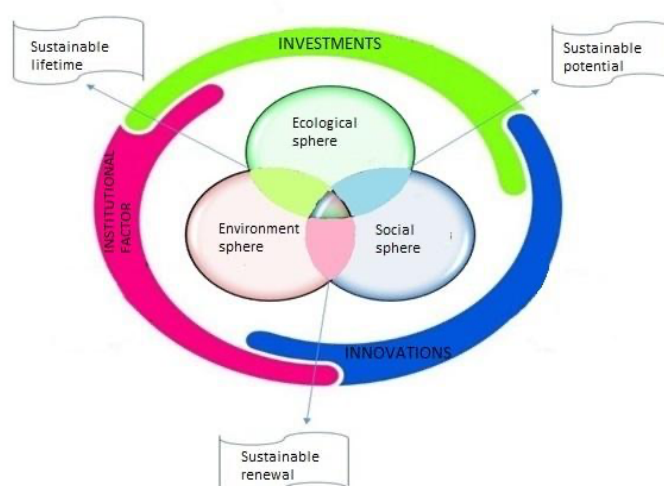
According to our estimation by increasing investments in agriculture by 8,35%, the increase in other indicators can be achieved, in particularly: gross output – 25.06%; labor productivity-24.78% and the average monthly salary-23.11%.

Discussion

Nowadays measures to support the agricultural production have to be complemented with projects of sustainable integrated development of rural areas which embrace not only agriculture, but forest, water, local manufacture, tourism, social and household infrastructure, and other activities, without which it seems not feasible to increase the rural economy's efficiency and improve living standards in villages (Wolfart *et al.* 2022; Kornilova *et al.* 2022).

Therefore, transformation to sustainable rural development allows ensuring an integrated and comprehensive solutions for prime problems of rural areas in the framework of the whole concept, the main focus of which is a rural citizen.

Figure 6. Sustainable rural development



Note: compiled by the author

Both, national and international experience suggested that the sustainability of rural places firstly is ensured by its economic efficiency component. At present time, the role of these territories as food security providers will have been preserved, however, for an efficient transformation for sustainable development it is necessary to diversify

agriculture with the adding share of the processing industry, and non-agricultural alternative businesses and services.

As for the government, to achieve sustainable rural development it is required to implement a program-targeted approach, allowing the enhancement of coordination to support rural areas development, boost the efficiency of resources utilized for intensive and dynamic progress, ensure the sequence, and integrity of positive transformations to solve priority tasks.

To sum up, the transformation to sustainable rural development can be possible if the employment of rural dwellers increases, the margin between the city and rural workforce's income decreases, and social and production infrastructure is available, and the optimal life and entrepreneurship opportunity is created.

It is a primary necessity for agriculture to invest in environment and technical renovation for performing operations effectively and intensively. Analysis of such kind of investment structure in agriculture indicates escalating investments for land reclamation and water resources protection.

To expand production and increase product competitiveness it is required to create joint venture entities in agriculture. To attract foreign investments into the Kazakhstan economy, which is currently, has high investment appealing; the main condition, in our opinion, is converting the significant part of them into agriculture.

There are the following aspects for systematic analysis of investment projects: commercial, technical, institutional, social, ecological, financial, and economic (evaluation of public effect) (Makeev *et al.* 2019). One of the main specific criteria is gross income, the growth rate of net agricultural produce and profit, gained as a result of the investment.

The increase of investment efficiency should be on all stages of investment process. At the stage of the development of investment program the identification of the most efficient ways of republican, regional projects must be performed.

The primary attention should be paid to investment project process, by taking into account the science and technology progress, implementation of advanced technology and new equipment, the efficient use of production capacities, improving the quality and reliability of economic research and investment projects, and selection of the most efficient one.

The first and foremost direction for agricultural investments are producing high-yield grain, oil, and technical crops, production of high-yield agricultural crops seeds, production of highly nutritious, environmentally friendly feed and feed additives; the processing of food, mandatory insurance of plant production, a program of development for rural areas and its industrial and innovative escalation, development and implementation of the strategy of rational utilization of resources, based on stimulation of the intellectual and innovative, and investment activity.

The realization of industrial and innovative development programs ensures the intensive development of innovative production structure and maximization of the effective use of investments for performing innovative programs and projects and intensifies investments in Kazakhstan to effective economic development and increase the living standard for the population.

Conclusion

The definition for sustainable development of rural territories was clarified in this study, where it was emphasized that it is a purposeful process of stable development of rural territories, which characterizes the social, economic and environmental condition, focused on attracting investment, using innovations, developing a financial and investment strategy. According to this definition there is a close connection between investments and primary indicators of rural development.

Undoubtedly, the contribution of investment into the industry will lead to innovations, improving material and technical infrastructure development etc.

It is necessary to take into account that the institutional level must take participation in this process, the interconnection of which was shown in the picture 6. Having such organized and interconnected work, there is a high probability to achieve the high life standard for rural population in the future.

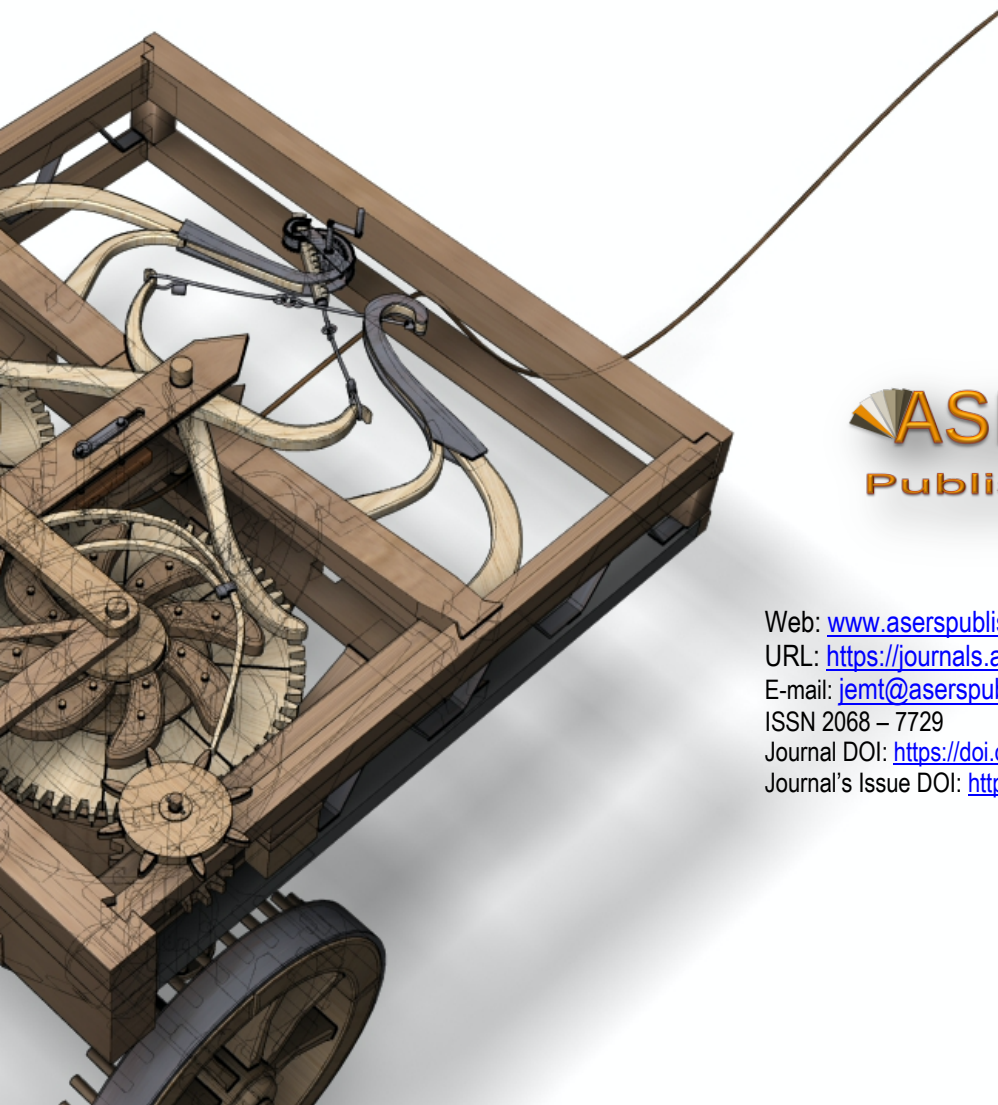
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