

GULNARA NYUSSUPOVA

Al-Farabi Kazakh National University, Almaty, Kazakhstan

VLADIMIR UVAROV

Al-Farabi Kazakh National University, Almaty, Kazakhstan

MADIYAR KADYLBKOV

Al-Farabi Kazakh National University, Almaty, Kazakhstan

GAUKHAR AIDARKHANOVA

Al-Farabi Kazakh National University, Almaty, Kazakhstan

ANATOLY STEPANOV

Ural Federal University, Ekaterinburg, Russia

ALEXANDER BURNASOV

Ural Federal University, Ekaterinburg, Russia

Trends and Development Prospects of Ayagoz District of East Kazakhstan Oblast in the Conditions of Transformation of the Region's Economy

Abstract: Industrial development is the most important task for the economy of Kazakhstan. In 2010, a course was taken to diversify the economy. In 2010–2014 implemented was The State program of forced industrial and innovative development. Today, the implementation of the second five-year industrialisation period is nearing its completion. The aim and tasks of research is to conduct a comprehensive description of the impact of the Aktogay mining and processing complex on the components of the socio-economic development of the region. To achieve this goal, the following tasks must be completed: analyse the state of socio-economic processes in the Ayagoz district of the East Kazakhstan oblast for the study period; describe the impact of the Aktogay mining and processing complex on the current state of socio-economic development of the East Kazakhstan oblast. In the framework of the State program of forced industrial and innovative development of the country in 2010–2014 a total number of 162 projects were implemented with a total investment of 41.9 billion dollars. One of the "breakthrough projects" is the construction of the Aktogay mining and processing complex in the East Kazakhstan oblast. The construction of the Aktogay MPC contributes to: the development of the economy of the Ayagoz district of East Kazakhstan oblast; increase of the potential of mining industry of Kazakhstan through the introduction of new technologies that are used in extraction and processing of ore, as well as in the production of the final product. The article analyses the state of socio-economic development of the Ayagoz district and East Kazakhstan oblast before and at the operation of the Aktogay MPC. Indicators were selected by social and economic blocs for 2009–2018. Taking into account the particular location of the Aktogay MPC, criteria were selected for each component of the socio-economic environment that reflect both the positive and negative residual effects of non-ferrous metallurgy enterprises. The significance of positive and negative impacts for each component was evaluated using statistical data on socio-economic indicators. For analysing the social environment of East Kazakhstan oblast, indicators were the measures of favourable or unfavourable activities in meeting the social needs of the population of the region. For analysing the economic development of the region, the indicators are a comparative assessment of the effectiveness of the enterprise for the economy of the region.

Keywords: Ayagoz district; Aktogay mining and processing complex; influence; KAZ Minerals; living standards; population; socio-economic environment

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INTRODUCTION

The greater the environmental consequences of human activities, the earlier they should have been prevented – this conclusion was reached by American and Soviet scientists as a result of joint research conducted in the late 1970s. Until recently, environmental impact assessment (EIA) was the domain exclusively of the scientific community, which had in mind mainly the scientific forecast of changes in the state of the environment that occur under the influence of anthropogenic activities. The Soviet system of environmental impact Assessment was developed in the 1980s of the last century. This was practically an internal state procedure, since all participants in the process represented the state.

Abroad, the beginning of the activity called Environmental Impact Assessment (EIA) is considered to be the adoption by the Congress of the United States of America and then the signing by US President R. Nixon (1970) of the legislative act “National Environmental Policy” (National Environmental Policy Act – NEPA). The issues of social impact assessment did not immediately take their place in the preparation of the EIA (Burdge, Vanclay, 1996). Initially, the social approach was more presented as an economic analysis, it used mostly formal quantitative methods, such as calculating the change in population or demand for services. The situation changed in the 1980s, when opinion polls among the population became widespread. EIA has become a practice not only in the United States, but also in Australia, Canada and New Zealand (Taylor, Bryan, Goodrich, 2004).

The Aktogay ore body consists of an oxidised ore deposit overlying a sulfide deposit. Recent deposits also contain molybdenum as an associated component. In Kazakhstan, the methodology for assessing the environmental impact of economic activities has been developed in line with the requirements of the Environmental Code of the Republic of Kazakhstan Approved by Decree of the President of the Republic of Kazakhstan dated January 9, 2007 No. 212–III LRK.

RESEARCH OBJECT

Aktogay is a large open-pit mine in southeastern Kazakhstan, about 250 km from the Kazakh-Chinese border. Located in Ayagoz district of East Kazakhstan oblast, 22 km east of Aktogay railway station. KAZ Minerals PLC develops the field. Aktogay in the administrative division is located in the area of Ayagoz district of East Kazakhstan oblast.

In the 1970s, new development prospects arose for the Ayagoz district: a large copper deposit was discovered 22 km from Aktogay. The resources of the deposit were estimated at 1.7 billion tons, the total amount of copper in the ore is 5.8 million tons.

Figure 1. Location map of research areas



Source: authors' own work

However, due to high capital costs and low levels of production and processing, the development of one of the largest fields in the world was difficult.

Aktogay is one of the largest undeveloped copper deposits in the world; it contains about 3.5 million tons of recoverable copper. With the current level of production, the resource base allows you to operate the mine for 50 years. In 2011 was launched Aktogay Mining and Processing Complex (MPC) of Kazakhmys (KAZ Minerals since 2014).

The Aktogay ore body consists of a Deposit of oxidised ores lying above the sulfide deposits. The latter deposits also contain molybdenum as a passing component.

In the 1970s, new development prospects emerged for the Ayagoz district: a large copper Deposit was discovered 22 km from Aktogay. The resources of the Deposit were estimated at 1.7 billion tons, the total amount of copper in the ore is 5.8 million tons. However, due to high capital expenditures and low production and processing levels, the development of one of the largest deposits in the world was difficult.

In 2012, the copper mining company "KAZ Minerals" approved the development project of the Aktogay field. In December 2015, the production of copper cathode from oxide ore began at the Aktogay mining and processing complex (MPC). In 2017, a project was developed to expand production, which will double the capacity of sulfide ore processing (KAZ Minerals PLC, 2019).

The nearest localities of Ayagoz district from Aktogay MPC are: Aktogay railway station (7.5 K); Zhuzagash railway station (12 km); Kopa (13 km); Karakum (20 km). The distance to the administrative center of the district – Ayagoz – is 116 km.

The following methods and materials were used while conducting research: comparative analysis methods, statistical methods, groupings and systematisation, structural analysis of socio-economic indicators.

SOCIAL COMPONENTS OF IMPACT ASSESSMENT

Assessment of the impact of production processes of existing enterprises on the socio-economic environment is carried out in several stages. The process of determining the composition of the components of the socio-economic environment is the starting point in the process of assessing the overall impact. Structurally, the components under consideration include the components of two blocks: the Social Sphere block and the Economic Sphere block, which reveal the socio-economic situation in the territory of the planned activity (Table 1) (Skolsky, Namyatov, Uvarov, Rudenko, Eidinov, Skolskaya, 2010).

Table 1. Components of the socio-economic environment considered in the impact assessment

Components of the social environment	Components of the economic environment
Labour resources and employment	Economic development of the territory
Income and standard of living	Transport network
Public health	Agriculture and land use
Demographic situation	Industry

Source: compiled by the authors based on *Methodological instructions for assessing the impact of economic activities on the natural environment*

Labor resources and employment. According to state statistics bodies, as of January 1, 2018, the number of employed people in the East Kazakhstan oblast amounted to 679,000 people (95.2% of the total economically active population).

Table 2. Main indicators of the labour market

Indicator	Republic of Kazakhstan			East Kazakhstan oblast			Ayagoz district		
	2009	2014	2018	2009	2014	2018	2009	2014	2018
level of economically active population, %	70.2	70.7	70.0	67.0	67.2	66.9	–	69.4	68.3
level of employment, %	66.1	67.1	66.6	62.7	64.0	63.7	–	58.4	65.2
unemployment rate, %	6.6	5.0	4.9	6.4	4.8	4.8	–	4.9	4.6

Source: compiled by the authors based on *Social and economic development of the Republic of Kazakhstan 2010–2018*, Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan

Over the period of 2009–2018, the labour market in both the Ayagoz district and the East Kazakhstan oblast, as well as in the Republic as a whole, has seen a decrease in the share of the economically active population. Over the past five years, the country and the East Kazakhstan oblast have seen a decrease in the level of the employed population, which indicates an aging population, when in the Ayagoz district there is a positive trend in the share of the employed population.

According to the Ayagoz district development Program for 2016–2020, in the Ak-togay station in period from 2014 to 2018, the unemployment rate decreased by 0.3%. 688 additional jobs were created.

The main indicator of the standard of living of Ayagoz's population was and remains the state of agricultural production. In the region, 5 million hectares of land are occupied for agricultural production, which is the third indicator among the regions of the republic. Therefore, the largest number of people employed in 2018 in the Ayagoz district is in agriculture – 28.8%, industry – 8.2%, wholesale and retail trade – 21.1%. The minimum number of employees falls on activities related to the construction industry – 2.6% (Table 3).

Table 3. Structure of the employed population by types of economic activity in Ayagoz district in 2014–2018

	2014		2018	
	share in the structure of the employed population, %	employed population, people	share in the structure of the employed population, %	employed population, people
Agriculture	42.43	14,669	28.8	9,431
Industry	1.39	480	8.2	2,681
Construction	1.50	520	2.6	863
Trade	7.57	2,618	21.1	6,899
Transport	8.31	2,873	6.2	2,021
Public service and security	14.09	4,872	12.5	4,095
Education	11.54	3,990	12.2	3,982
Other	13.17	4,554	8.4	2,719

Source: compiled by the authors based on *Social and economic development of the Republic of Kazakhstan 2010–2018*, Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan

As we can see from Table 3, in the structure of the employed population by types of economic activity in the dynamics of 2014–2018, there is an increase in the share of the employed population in industry by 6.8% and trade by 13.5%, when the share of those employed in agriculture decreased by 13.6%.

In the East Kazakhstan, oblast in 2009–2018 there is a decrease in economically active population (EAP) by 56,000 people (by 7.3%), and the employed population by 36,100 people (by 5%). The proportion of the employed population in the total number of EAP of the region in 2018 amounted to 95.2%, the number of unemployed people – 34,600 people. The unemployment rate for the period 2009–2018 decreased by 1.3% and amounted to 4.8%.

According to the results of 2018, the number of EAP in the Ayagoz district amounted to 36,100 people. Compared to 2009, there was a decrease of 3.7% or 1,400 thousand people. (in 2009 – 37,500 people) due to a decrease in the employed population by 1,000 people.

The level of economic activity of the population in the region of 68.7% (in 2018), which is higher than the regional indicator (in the region of 66.7%). For the period 2009–2018, the number of officially registered unemployed in employment agencies decreased from 205 in 2009 to 160 people in 2018 or 22%. Accordingly, the share of registered unemployed in the number of EAP in Ayagoz district amounted to 0.4% (0.5% in the region), decreasing by 0.1 percentage points compared to 2013.

In 2018, the number of applicants for employment in the Ayagoz district amounted to 1,763 people, which is 63.1% more compared to 2013 (in 2013 – 1,081 people). Of these, 1,363 people were employed, the level of employment was 77.3%.

The main results of promoting employment were job creation, employment for social jobs and youth practice by Aktogay MPC.

In 2018, 655 new jobs were created in various sectors of the economy. In 2018, 521 people were sent to paid public works.

To support youth under the Youth Practice program, graduates of educational institutions were sent to youth practice every year to gain work experience. In 2013–2018 In total, 92 young specialists were sent, of which 80% were given the opportunity to find a permanent job at the place of practical training.

In addition, in Ayagoz district, 182 people were sent for vocational training and vocational training in 2018. Of those who completed the training, 148 people were employed for permanent work in 2018.

As part of the implementation of the “Employment Roadmap 2020” in 2015, 530 people applied through the district employment center. Of the number of applicants in 2015, 435 people were employed, of which 188 people (43.2%) were unemployed, 247 people self-employed (56.8%).

According to the Ayagoz district Development Program for 2016–2020, in the village of Aktogay, from 2013 to 2015, the number of unemployed decreased by 34 people or 22%. 688 additional jobs were created.

Also, according to preliminary calculations, Kaz Minerals PLC, during the launch of the mining and processing plant (MPC), the need for workers and engineering workers of the plant is 1,030 people. To prepare the future personnel of the mining and processing enterprise, a proposal has been made to place a state order for training in necessary specialties in secondary specialised educational institutions of the East Kazakhstan oblast. According to the forecast data of the statistics committee, due to the increase

in jobs, the population of Aktogay railway station may increase to 9,500 people (KAZ Minerals PLC, 2019).

The main problematic issues in the field of employment in Ayagoz district are:

- lack of permanent jobs in rural areas;
- high level of youth and female unemployment;
- high proportion of low-income citizens among the unemployed and self-employed;
- non-compliance of professional training with the needs of the labour market.

In general, the analysis of the situation on the labour market of the region shows a positive trend over the last 5 years: the constant growth of the employed population, increase in the number of employed unemployed, reducing unemployment, reducing the share of employed population in agriculture and increasing the share of employed population in industry and trade (Nyussupova, Kalimurzina, Kelinbayeva, 2017).

Income and standard of living. The main indicator of the population's standard of living is the amount of income received. The income of the population is directly related to wages. According to the Statistics Committee of the Ministry of national economy of the Republic of Kazakhstan, as of January 1, 2018, the average monthly salary of one employee in Ayagoz district was 454 dollars, an increase of 30% compared to the same period in 2017 (Table 4). This indicator is higher than the regional average (401 dollars) by 53 dollars.

Table 4. Average monthly nominal wages of one employee for the period 2009–2018, tenge/dollars*

Region	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Republic of Kazakhstan	66,674 /	77,611 /	90,028 /	101,263 /	109,141 /	121,021 /	126,021 /	142,898 /	150,827 /	162,673 /
	442	525	616	674	710	665	672	404	450	465
East Kazakhstan oblast	50,209 /	58,478 /	69,451 /	84,872 /	90,263 /	99,130 /	103,028 /	118,736 /	125,911 /	140,126 /
	333	396	475	565	587	544	549	336	376	401
Ayagoz district	50,161 /	55,052 /	63,292 /	84,666 /	89,591 /	85,917 /	86,594 /	103,922 /	105,718 /	158,913 /
	333	372	433	564	583	472	462	294	315	454

Source: compiled by the authors based on *Social and economic development of the Republic of Kazakhstan 2010–2018*, Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan

The income level in the district is higher than the regional average (401 dollars) by 53 dollars and lower than the national average by 11 dollars. As of January 1, 2018, workers employed in the field of industry – 454 dollars, construction – 384 dollars, formed the highest salary in the Ayagoz district. The lowest level of remuneration was noted for employees engaged in professional, scientific and technical activities – 167 dollars.

Public health. The morbidity of the population is one of the integral and visual indicators of the state of health of the population.

The impact of the work on human health can be carried out through two environments: the hydrosphere and the atmosphere.

The composition of emissions during work includes substances, mainly from working equipment.

The results of the calculation of emissions of pollutants into the atmosphere during work and analysis of their impact showed that their surface concentrations at the

border of the sanitary protection zone, which is 500 m, do not exceed the maximum permissible concentrations.

The analysis of the primary morbidity of the population of the East Kazakhstan oblast for the period from 2009 to 2018 shows a decrease in the incidence rate by 1.2 times. At the same time, the morbidity rates of the region's population continue to be higher than in the Republic of Kazakhstan as a whole.

Table 5. Primary morbidity of the population in the Republic of Kazakhstan and East Kazakhstan oblast for 2010–2018

Region	number of diseases registered for the first time in life per 100,000 people								
	2010	2011	2012	2013	2014	2015	2016	2017	2018
East Kazakhstan oblast	70,423.5	66,871.5	64,286.4	62,672.6	58,620.6	59,011.2	62,824.0	66,509.4	67,215.5
Republic of Kazakhstan	58,077.1	56,195.8	55,168.8	53,954.5	52,031.5	52,410.7	57,172.2	58,282.7	-

Source: compiled by the authors based on *Social and economic development of the Republic of Kazakhstan 2010–2018*, Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan

The level of primary morbidity of the population in the East Kazakhstan oblast during the period under review is higher than the national average (Table 5).

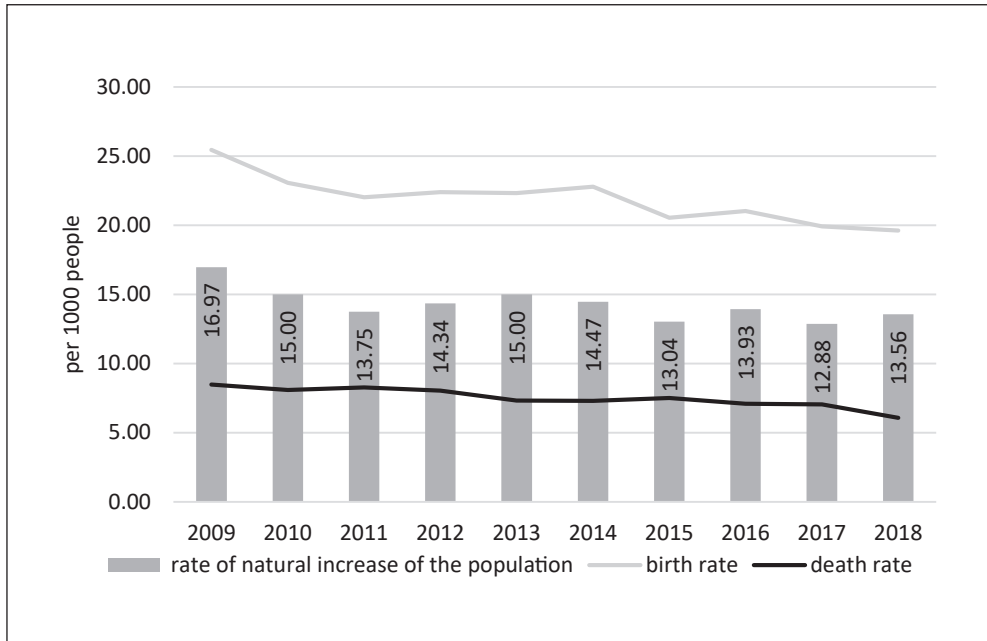
During the period under review, both in the Ayagoz and East Kazakhstan oblast and throughout the country, there was a decrease in the number of hospitals, outpatient clinics, hospital beds and the provision of hospital beds for the population. Thus, in the Ayagoz district, the decrease in the number of health organisations was: health organisations by 2 units, hospital beds by 131 units. At the same time, the provision of hospital beds decreased from 49 in 2009 to 32 in 2018. In general, the provision of hospital beds per 10,000 people in the region is significantly lower than in the region (1.8 times) and the Republic (1.6 times).

With the decrease in health care organizations, it should be noted that in 2015, social investments of the company "KAZ Minerals" amounted to \$15.2 million, including sponsorship, assistance and donations for projects for the local population directly in the regions of production activities, as well as for projects at the national level. The main social projects of the Eastern region include financing the construction of a new Hematology center in the Semey city, road repairs in the Glubokiv district, delivery in operation of the Palace of culture to local authorities and the purchase of medical equipment for the East Kazakhstan oblast hospital in Ust-Kamenogorsk (KAZ Minerals PLC, 2019).

Demographic situation. The population of Ayagoz district as of January 1, 2019 was 72,695. In terms of population, the district occupies second place among the districts of the East Kazakhstan oblast. It should be noted that the population of Ayagoz district is 5.3% of the total population of the East Kazakhstan oblast, the area of the district occupies 17.5% of the territory of the region.

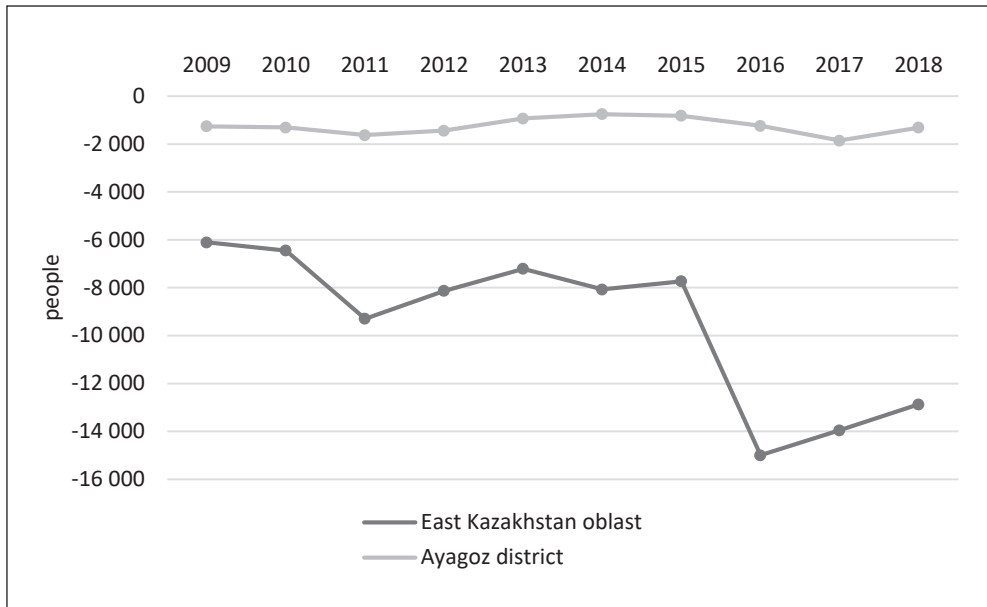
At the same time, the territory of the district is unevenly populated. The highest population density is observed in the north-eastern and eastern parts of the territory (1.5 people per 1 km²). The least densely populated are the southwestern rural districts, where the economic potential and environmental conditions are not favorable for life (0.1 people per 1 km²).

Figure 2. Dynamics of natural population growth in Ayagoz district for 2009–2018



Source: authors' own work

Figure 3. Migration balance of Ayagoz district and East Kazakhstan oblast for the period 2009–2018, people



Source: authors' own work

The population of Ayagoz district is exclusively rural and in 2019 amounted to 34,155 people, a decrease in comparison with 2018 (34,710 people) by 555 people.

Over the period of 2009–2018, the population of East Kazakhstan oblast decreased by 19,600 people (1.4%), the number of residents of Ayagoz district decreased by 1,900 people (2.5%).

As the figure below shows, over the past few years the number of people who left the Ayagoz district has exceeded the number of arrivals, i.e. the migration balance of the Ayagoz district during 2012–2015 is negative, and for 2014–2015 it continues to increase (in 2014 – 752 people, in 2015 – 819 people).

The main reasons for the negative value of migration growth are the low standard of living of the population, low incomes, insufficient qualifications of the population, and difficulties in getting a job (Nyussupova, Rodionova, 2011).

The population of the region is formed by natural population movement and migration flow. Thus, for the period 2009–2018, the natural growth in the Ayagoz district averaged 14.29%, while the migration balance was negative (Figure 2). Differentiation of the quality of life is the main reason for the negative value of migration balance in the regions of the Republic of Kazakhstan, due to the outflow of population from all oblasts to the major cities of Republican significance Nur-Sultan and Almaty (Nyussupova, Kalimurzhina, Kelinbayeva, 2017).

The Department of Economics and Budget Planning of the Ayagoz District has developed the “Program for the Development of the Territory of the Ayagoz District of the East Kazakhstan oblast for 2016–2020”. The strategic directions of the program are:

- the accelerated development of the region’s economy through the introduction of high-performance innovative technologies in industry, agriculture, in investments, small and medium enterprises, trade, tourism and the environment;
- development of the social sphere and human potential, improving the quality of life of the population, providing all types of quality social services.

ECONOMIC COMPONENTS OF IMPACT ASSESSMENT

To assess the impact of the Aktogay mining and processing complex on the economic environment of the oblast, the following indicators were selected:

- Economic development;
- Agriculture and land use;
- Transport network;
- Industry.

Economic development. Ayagoz district is located in the south-west of the East Kazakhstan oblast in Kazakhstan. In the economy of the district, mainly railway organisations, energy, heat supply, mining, agriculture, trade and utilities occupy the leading places.

The main indicator of the standard of living in the Ayagoz district was and remains the state of agricultural production.

A distinctive feature of animal husbandry is its diversified nature. Depending on the natural and climatic conditions and economic activity, the district successfully develops dairy and meat cattle breeding, fine wool and rough-wool sheep breeding, horse breeding.

The volume of gross agricultural output in January-February 2017 amounted to 47.4 million dollars. The physical volume index compared to January-February 2016 was 104.4%. (Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan, 2019)

Transport network. Ayagoz district has a developed transport infrastructure. The transport network consists of roads and railways.

The district's transport network is an important part of the transit system with access to the Karaganda and Almaty regions, the People's Republic of China and the Russian Federation. One of the key points of the regional transport system is the regional centre – the city of Ayagoz.

Automobile transport. The district has the longest network of public roads in the region, which is 1,123 km, including:

- republican significance – 500 km (44.5%);
- regional significance – 215 km; (19.1%);
- district significance – 408 km (36.4%).

The Ayagoz district is connected to the Almaty and Karaganda regions by the roads “Almaty–Ust-Kamenogorsk”, “Karaganda–Ayagoz–Bogas”.

The main transit corridor passing through the district is the Republican highway “Almaty–Ust-Kamenogorsk” connecting the Ayagoz district with the Almaty region and the People's Republic of China through the Urjar district.

Road transport is the main form of public transport connecting the settlements of the district.

50.8% of settlements are provided with regular passenger services by all means of transport. The insecurity of certain settlements is associated with the loss of intra-district routes, the presence of illegal carriers that carry out passenger transportation without relevant permits and the unresolved issue of financing the losses of potential carriers from the local budget.

The average amount of time to move from a rural centre to a district centre is approximately 2.5 hours.

39.0% of republican roads are in good condition, 30.5% are in satisfactory, 30.5% are in unsatisfactory. The proportion of local roads in good and satisfactory condition is 53.7%, in unsatisfactory – 46.3%.

Railway transport. The Ayagoz branch of the railway serves as a link for industries such as metallurgy, mining, construction materials, engineering, agricultural and food industries.

The length of the main railway lines in the region is 164 km, the operational length is 164 km, which is 15.0% of the total length of the region's railways.

The railway network coverage of the region is approximately 10%: 15 settlements have access to the railway within a radius of 50 km.

Passengers and baggage are transported in the following interregional and international directions: Protection – Almaty, Semey – Kyzylorda, as well as transit: Novokuznetsk – Semey – Bishkek, Novosibirsk – Semey – Almaty, Novosibirsk – Semey – Tashkent, Pavlodar – Semey – Almaty, Pavlodar – Semey – Karaganda.

Rail transport connects the regional centre with the cities of the region – Semey, Kurchatov, Shar and the regional centre – Ust-Kamenogorsk.

Key performance indicators of transport in the East Kazakhstan oblast and Ayagoz district in 2013 and 2015 are presented in Table 6.

As the analysis of the table shows, for the period 2009–2018 for all indicators of the district’s transport, growth is observed, including in the transportation of passengers – by 49.5%, passenger traffic – by 9.0%.

The specific weight of the district in the general regional volume in 2018 amounted to: 0.03% for passenger transportation, 0.05% for passenger traffic.

Table 6. The main indicators of the work of transport in the East Kazakhstan oblast and Ayagoz district in 2009–2018

Administrative unit	Year	Passengers transported, thousand people	Passenger turnover, thousand pkm	Freight, luggage, cargo luggage transported, thousand tons	Cargo turnover, thousand tkm
By oblast, total	2009	1,141,991.9	9,869,333.6	279,495.0	6,007,320.3
	2010	1,272,724.2	11,506,403.9	327,327.5	7,178,558.1
	2011	1,419,338.4	17,245,700.9	418,211.6	10,398,638.7
	2012	1,459,878.9	20,035,036.7	476,906.1	11,265,319.2
	2013	1,606,747.9	21,144,184.3	553,666.9	13,109,011.7
	2015	1,680,993.1	21,290,413.9	598,756.9	14,497,730.5
	2016	1,705,150.7	22,187,365.7	582,434.4	15,236,497.2
	2017	1,709,157.7	22,272,519.8	600,835.0	16,099,069.1
Ayagoz district	2009	266.7	8,018.8	-	-
	2010	294.1	7,723.2	-	-
	2011	276.3	9,457.1	-	-
	2012	260.2	9,101.0	-	-
	2013	312.0	9,481.0	-	-
	2015	466.4	10,337.0	-	-
	2016	478.3	10,503.0	-	-
	2017	22,446	341,376.4	-	-
2018	-	409,336.1	-	-	

Source: compiled by the authors based on *Social and economic development of the Republic of Kazakhstan 2010–2018*, Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan

Agriculture and land use. In the structure of agricultural land in Ayagoz district, pastures prevail – 95.8%, followed by hayfields – 2.7% and arable land – 1.5%.

The total land area and distribution of agricultural land in Ayagoz district and East Kazakhstan region as a whole are presented in Table 7.

Table 7. The total land area and distribution of agricultural land in Ayagoz district and East Kazakhstan region in 2015, thousand hectares

Region	Total land area	Total farmland	Arable land	Perennial plantations	Layland	Hayfields	Pastures	Gardens and official allotments
Ayagoz district	1,539.3	1,530.9	23.4	0.109	0.660	40.8	1,466.0	0
Total by oblast	10,424.9	10,270.4	1,430.7	2.2	34.8	441.7	8,360.7	0.3

Source: compiled by authors, *Environmental Protection and Sustainable Development of the Republic Of Kazakhstan 2010–2018*, Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan (2019)

Analysis of the table shows that the area of agricultural land in the region is 14.9% of the total agricultural land of the East Kazakhstan oblast. In the distribution by types of agricultural land in the region, the area of arable land, hayfields and pastures of the district occupy 1.6%, 9.2% and 17.5%, respectively.

Table 8. Peasant or farm enterprises (including individual entrepreneurs)

Region	2011	2012	2013	2014	2015
Total by oblast	19,351	20,622	19,211	19,993	17,416
Ayagoz district	1,584	1,700	1,197	1,244	1,139

Source: compiled by authors, *Environmental Protection and Sustainable Development of the Republic Of Kazakhstan 2010–2018*, Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan (2019)

As the table shows, for the period 2011–2015 the number of peasant farms decreased both in the region (by 1,935 units) and in the district (by 445 units).

The main direction of the agro-industrial complex of the region specialises in animal husbandry with developed crop production.

Livestock production accounts for 75.9% of the gross agricultural output of the region. The specific gravity of the Ayagoz region in the structure of livestock production in the region is 6.9%.

Crop production accounts for 24.1% of the total agricultural production of the region. The region's share in the structure of crop production in the region is 2.9%.

The crop industry of the region is carried out in the conditions of rainfed farming, where the production of grain and leguminous crops became widespread.

According to the program for the development of the territory of the Ayagoz district for 2016–2020, in 2016 cereals were sown on 7,890 hectares, sunflower – 500 ha, potatoes – 350 ha, vegetables – 150 ha, melons – 21 ha. The area of fodder crops amounted to 12,435 ha.

In 2018, the gross agricultural output of the Ayagoz district increased by 16.7% compared to the previous year and amounted to 100.1 million dollars, including crop production – 24 million dollars, livestock – 76.8 million dollars (Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan, 2019).

Industry. The volume of industrial production in January–November 2017 amounted to 186 million dollars, which amounted to 173.1% compared to the corresponding period last year (2016 – 68.1 million dollars). Mining industry amounted to 102.4 million dollars, which is 30 times more than the corresponding period of the previous year (2016 – 3.4 million dollars), manufacturing 82.7 million dollars, which is compared with the corresponding period of the last year 132.6% (2016 – 62.4 million dollars).

The volume of industrial production in January–February 2017 amounted to 483.9 million dollars, which is 9.1% higher than the level of January–February 2016. The growth in the mining industry amounted to 34.7%, in the manufacturing – 8.9%. At the same time, in the electricity supply, gas, steam and air conditioning, the physical production volume decreased by 4.3%, in water supply; sewer system, control over the collection and distribution of waste – by 6.5% (Committee on Statistics of the Ministry of National Economy of the Republic of Kazakhstan, 2019).

According to the Ayagoz District Development Program for 2016–2020 maintaining and building up the industrial potential of the mining industry is planned through

the implementation of a number of projects under the State Program for Industrial and Innovative Development of the Republic of Kazakhstan for 2015–2019 (SPIID) (Table 9–10).

Table 9. Mining Projects under the SPIID

Company	Projects	Stage of implementation
KAZ Minerals PLC	„Construction of the Aktogay mining and processing plant”	at the implementation stage
LLP „Taskara”	„Construction of the Taskorinsky gold recovery factory”	implemented in 2013
KEMP – Vostok LLP	“Construction of a mill for the processing of ores of the Sharyk deposit by heap leaching”	implemented in 2014
BI STONE LLP	„Industrial processing of decorative natural stone”	implementation period 2018

Source: authors’ own work

Table 10. Production of industrial enterprises, thousand tenge / thousand dollars

Type	2009	2018
Manufacturing industry	3,015.1 / 20.0	30,446.1 / 87.1
Electricity, gas, steam and air conditioning	400.2 / 2.7	789.2 / 2.3
Water supply, sewerage, waste collection and distribution control	129.2 / 0.86	302.2 / 0.86
Mining industry	176.1 / 1.2	47,644.4 / 136.2
Total	3,720.6 / 24.7	79,181.9 / 226.4

Source: authors’ own work

In 2018, the share of mining industry in the structure of industrial production in Ayagoz district amounted to 13.4%, and manufacturing – 79.3%. The share of electricity, gas, steam and air conditioning accounts for 4.3%, water supply, sewage system, waste collection and distribution amounted to 3.0%.

It should be noted that in 2018 the volume of investments in fixed assets amounted to 476.2 million dollars, which is 4.5 times more than the 2014 figure (in 2014 – 104.7 million dollars). The increase in investment was due to the construction of Aktogay MPC.

SUMMARY

Based on the analysis of socio-economic components of the impact assessment, potentially significant impacts of the mining and processing complex were identified. Direct impacts in the socio-economic environment were identified:

- increase in the number of employed people in industry from 480 people in 2014 to 2,681 people in 2018;
- training the local workforce;
- increase in the average monthly salary of one employee in the Ayagoz district;
- indirect job creation in other service areas;
- local skilled workers will be preferred when hiring staff;

- repair of automobile and railway tracks for comfortable movement of shift workers and population as a whole;
- there is no negative impact on the health of the population of MPC, since there is a decrease in the dynamics of primary morbidity of the population;
- the company's contributions to the budget of the East Kazakhstan oblast will help to improve the socio-economic situation in the region;
- in accordance with the state program of import substitution at all stages of the project, all necessary goods and services will be purchased mainly from local Kazakh suppliers. Preference will be given to the conclusion of contracts with enterprises of East Kazakhstan oblast (if they perform their work efficiently and at competitive prices).

The activity of the Aktogay mining and processing complex gives the industry and the economy of the oblast as a whole greater stability.

The remoteness of the nearest settlements from the site of the Aktogay mining and processing complex at a distance of 7.5 km or more does not affect the health of residents of residential areas. Calculations of the risk to public health have shown that it will not be higher than an acceptable level. Therefore, there is no negative impact on the health of the population.

One of the most acute problems of social development of the region was employment, but the opening of the mining and processing complex has a positive impact on employment of the population of the region by creating new jobs in the construction phase of the mining and processing complex and commenced work on the development of the field.

Additional employment opportunities have led to an increase in the income of people working at the complex, and those who provide services to the company. The increase in income will increase purchasing power.

"KAZ Minerals" is the largest investor and client of Kazakhstan's suppliers of goods and services, influencing many socio-economic indicators of the Ayagoz district, East Kazakhstan oblast, and the economic development of the Republic of Kazakhstan. At the same time, a significant amount of revenue to the budget comes as a result of payments for emissions.

Impact on internal migration of the population can be assessed as positive as the slowdown of the departure of the indigenous population from the places of permanent residence, access to international experience, the positive impact for the economy and social sphere contribute to the formation of loyal attitude of the local population to mining activities, effective communication with local populations minimized people's concerns and misunderstanding of the possible impact on their health.

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Gulnara Nyussupova, professor, Head of the Department of Geography, Land Management and Cadastre, Al-Farabi Kazakh National University, Almaty, Kazakhstan. Research interests: socio-economic asymmetry in the economic development of the regions, the impact of globalisation on the transformation of regions, GIS technology, economic geography. Author of over 300 works in this field, including 5 monographs.

ORCID: 0000-0001-5294-2671

Address:

Al-Farabi Kazakh National University
71 Al-Farabi avenue, 050040 Almaty, Kazakhstan
e-mail: Gulnara.Nyusupova@kaznu.kz

Vladimir Uvarov, PhD, associate professor, Al-Farabi Kazakh National University. Research interests: environmental impact assessment, geoecology, glaciology, GIS, remote sensing. Author of over 90 publications (including 4 monographs, 3 study guides, articles, abstracts, scientific reports, etc.).

ORCID: 0000-0001-7817-683X

Address:

Al-Farabi Kazakh National University
71 Al-Farabi avenue, 050040 Almaty, Kazakhstan
e-mail: uvarov_59@mail.ru

Madiyar Kadylbekov, PhD student, Al-Farabi Kazakh National University. Research interests: environmental impact assessment, geoecology, GIS, remote sensing.

ORCID: 0000-0003-2761-3686

Address:

Al-Farabi Kazakh National University
71 Al-Farabi avenue, 050040 Almaty, Kazakhstan
e-mail: madiyar.kadylbekov@kaznu.kz

Gaukhar Aidarkhanova, PhD student, Al-Farabi Kazakh National University. Research interests: socio-demographic processes, human capital, quality of life.

ORCID: 0000-0001-7280-7071

Address:

Al-Farabi Kazakh National University
71 Al-Farabi avenue, 050040 Almaty, Kazakhstan
e-mail: gauhar_222@mail.ru

Anatoly Stepanov, PhD in Geography, professor, Head of the Chair of Economics of Institute of Further Education and Vocational Training, Ural Federal University named after the first President of Russia B.N. Yeltsin, Ekaterinburg, Russia. Research interests: socio-economic asymmetry in the economic development of the regions, the impact of globalisation on the transformation of regions, theory of clusters and cluster strategies, world economy, globalisation, cluster policy, economic geography. Author of over 360 works in this field, including 6 monographs.

ORCID: 0000-0002-6501-1072

Address:

Ural Federal University
Institute of Further Education and Vocational Training
St. Turgenev 4, office 350, 620083 Yekaterinburg, Russia
e-mail: anatoly_stepanow@mail.ru

Alexander Burnasov, PhD, Deputy Head of the Department of Theory and History of International Relations, associate professor, Chair of International Relations, Ural Federal University named after the first President of Russia B.N. Yeltsin, Yekaterinburg, Russia. Research interests: development of transport logistics in the context of globalisation, international communication and international cooperation, history, economy, logistics, globalisation. Author of over 30 works in this field, including 3 monographs.

ORCID: 0000-0002-9568-4542

Address:

Ural Federal University
Department of Theory and History of International Relations
St. Lenin 51, office 386, 620083 Yekaterinburg, Russia
e-mail: burnasov@mail.ru