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**THE ANALYSIS OF THE INFLUENCE THE ECONOMY  
OF THE ATYRAU REGION ON THE ENVIRONMENT**

**Abstract.** This article discusses the socio-economic development of Atyrau region, the priority areas of economic development of the region and its impact on the environment. Atyrau region is the largest oil and gas field in Kazakhstan. In the region's economy energy, construction materials, agricultural and fishery industries are well developed. On this basis, new bases for sustainable development are being created: the social infrastructure improvement, the creation of new jobs, the maximal employment of local population, the preparation of qualified specialists.

However, the region is named as the most ecologically unfavorable region in the country. The ecological situation in the region is formed by climate, anthropogenic factors and intensive development of oil and gas production. One of the global issues is the oil production wastes polluting the environment. In this regard, much attention is paid to solving this problem now. This is because the pollutants mentioned above, besides the environment harm a human body and lead to the various diseases. The article analyzes the effects of oil products on the environment, on the health of the population, and the current state of the Caspian Sea.

**Keywords:** socio-economic development, industrial development, economic activity, oil and gas complex, ecological catastrophe, ecosystem status.

**Introduction.** Today, the development of a particular city, region, or the whole state embraces the development that satisfies ecological growth, reduces ecological burden on the environment, and satisfies the needs of society in a way that does not hurt future generations.

Priority directions of economic development of the Atyrau region are fuel and energy, processing, agro-industrial and fisheries, and construction materials. The big contribution in the structure of the industrial production is crude oil and gas production, oil pumping, electricity production and distribution. The region's economy is one of the most developed regions with a potential for further diversification.

The basis of the region's economy is the manufacturing sector, which accounts for half of the gross regional product. According to the results of the first nine months of 2017, the gross regional product (GRP) will reach 3842.1 bln. The share of the GRP in the GRP of the republic was 10.9%. The volume of industrial production in January-November 2017 in current prices was 5090,9 billion tenge, which makes 25,1% of the republican volume of production.

The actual index of production volumes was 121,4% to the corresponding period of 2016. The mining industry produced goods to the amount of 4588.5 billion tenge, the real volume index – 123,8%. The manufacturing industry output amounted to 446,6 billion tenge, the real volume index – 103,6%. The volume of investments into main capital in January-November, 2017 amounted to 2221,2 billion tenge or 115,2% to the corresponding period of 2016. Atyrau region ranks 1st in the country due to the share of investment in main capital (29.7%) [1]. Within the second Five-Year Plan of the State Industrial-Innovative Program Development 26 projects worth 3.1 trillion tenge 3528 workplaces are planned to be implemented in the region [2].

At the same time, there is a positive trend of active participation of entrepreneurs in the state programs. As part of the business support map, 23 projects are being implemented at the local level with a total value of 69,8 billion tenge, with the creation of 1471 jobs. Of them, 13 projects totaling 25,8 billion tenge were commissioned in 2015-2016 year, 788 jobs were created.

In 2017 year, 5 projects worth 5 billion tenge, with the creation of 344 workplaces were implemented. As of November 1, 2017, the number of registered small and medium-sized businesses amounted to 55,101 units, which is 0,4% more than in the previous year, including the number of operating small and medium-sized enterprises - 43,153 units, increasing by 6,4% many. The volume of production of small and medium business entities in January-June 2017 amounted to 655,1 billion tenge, an increase of 53,3% to the corresponding period of 2016, an average of 124,2% in Kazakhstan [2]. Following the results of the regional development level of 2017, the region took the 1st place.

Table 1- Number of employed population by types of economic activity

Years	2012	2013	2014	2015	2016
<b>All the people</b>					
The employed population - total (person)	277 323	279 495	286 127	296 490	296 368
including:					
Agriculture, forestry and fish household	13 301	11 900	12 759	11 008	10 712
Industry and Construction	90 485	89 156	81 059	82 589	89 440
Service area	173 537	178 439	192 309	202 893	196 216
<b>Men</b>					
The employed population - total	145 492	141 886	149 497	152 680	154 617
including:					
Agriculture, forestry and fish economy	7 629	7 401	7 449	6 370	7 016
Industry and Construction	63 163	58 980	55 270	54 879	58 901
Service area	74 700	75 505	86 778	91 431	88 700
<b>Women</b>					
The employed population - total	131 831	137 609	136 630	143 810	141 751
including:					
Agriculture, forestry and fish economy	5 672	4 499	5 310	4 638	3 696
Industry and Construction	27 322	30 176	25 789	27 710	30 539
Service area	98 837	102 934	105 531	111 462	107 516
Note: Databases: Statistics Agency of RK [8].					

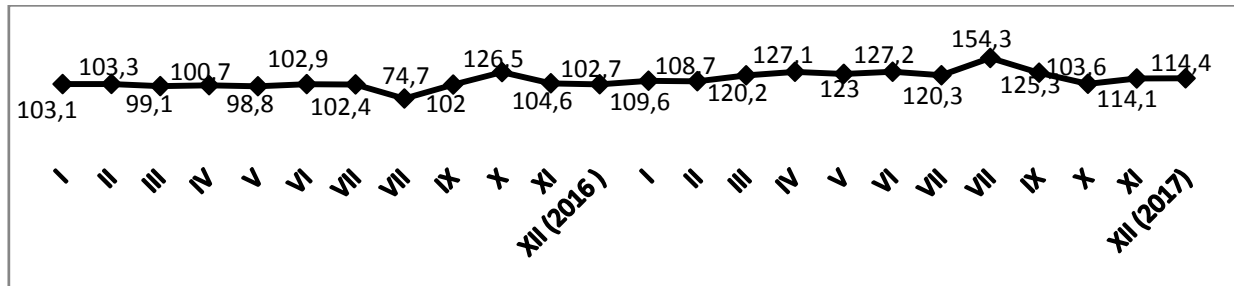
**Research methods.** In the course of the research, the methods of analysis and compilation were used to achieve the objectives. The methods of environmental research in the region have been analyzed by means of observations and surveys. Comparative table-based comparisons of general official statistical data were conducted.

**Results and discussion.** Atyrau region with its huge economic potential plays a special role in socio-economic development of Kazakhstan. Every year the number of companies with foreign participation is increasing. Today the region cooperates with about 1000 companies from 50 countries of the world.

This cooperation attracts modern management and technology to the region, the latest innovative world research, and contributes to the development of business tourism. It is one of the most developed regions and it is a potential region for further diversification of the economy[12].

For the further development within the Eurasian Economic Union it is possible to use the great opportunities considering the proximity of large Russian industrial regions. Petrol-chemical, machine building, food industry and construction industry are developed. The average monthly wage for January-

September, 2017, was 259834 tenge. In comparison with January-September 2016 decreased by 2,4%. The budget of Atyrau region has increased fourfold in the last ten years. A large-scale work is underway in the region to upgrade the communal and social infrastructure and improve the comfort of the population [3]. All population are gasified and accessible drinking water in all settlements has doubled.



Note - Source: this information is obtained from the Official Internet Resource of Atyrau region government [3].

Figure 1-The volume of industrial production in Atyrau region for 2016-2017 (in percent).

The development of Atyrau region is very important for Kazakhstan. This is due to the concentration of oil and gas resources that will allow improving the lives of the people living in the Caspian region and the quality of life of the whole Kazakhstan population, and attracts some investment in the development of hydrocarbon resources. The largest exporting companies in the region are Atyrau Refinery LLP, Embamunaigas, Agip KCO, Tengizchevroil LLP, Atyrau Neftemash LLP, Rauan Nalco LLP, Chevron MunaiGas Inc.

However, in terms of socioeconomic development Atyrau region is one of the leading regions, it occupies a special place among the regions and ecological disaster areas in Kazakhstan. The ecological situation here is formed under the influence of natural and anthropogenic factors, the most important of which is the increase of the level of the Caspian Sea and intensive development of the oil and gas complex. Increasing sea level is associated with damage to vegetation in shallow waters, As oil and gas wastes are exposed to water, the zone is polluted with sulfur and hydrogen.

Increased oil and gas production, high concentrations of extracted raw materials impact on air pollution, surface and underground water pollution, and due to these factors heavy metals, radionuclides and petroleum products damage the soils and vegetation[10].

Atmospheric air pollution remains one of the leading factors that adversely affect the environment. Atmospheric emissions of industrial enterprises of the region exceed 158 thousand tons a year, the main share of which is owned by oil and gas sector enterprises. In 2016, 12 oil and gas companies have extracted 9 billion cubic meters of associated gas from associated gas over 9.2 billion cubic meters.

Currently, four of the 12 oil and gas companies in Atyrau region, namely Tengizchevroil LLP, NCOC, Manash Petroleum, and Embamunaigas, use their associated gas as their own torches. In 2016 these oil companies burned 189 million cubic meters of associated gas [6].

Table 2- All pollutants emitted into the atmosphere in Atyrau region

Years	2013	2014	2015	2016	2017
<i>Total (tons)</i>	133 067,7	138 351,1	109 055,1	110 667,1	167 051,4
Hard	1 785,8	2 260,6	2 280,2	3 032,5	3 217,1
HP 10 (hard particles 10 mkm in diameter)	14,7	97,8	135,7	165,2	128,3
HP 2,5 (hard particles 2,5 mkm in diameter)	1 673,1	442,4	853,3	772,2	651,5
Gas and Liquid	131 282,0	136 090,5	106 774,9	107 634,6	163 834,2
Hydrocarbons (volatile without organic compounds)	49 383,6	25 538,8	16 949,9	12 553,8	9 561,9
Cushioned Organic compounds	15 786,6	24 066,2	19 232,6	9 496,2	8 627,2
Others	4 232,1	86 485,5	3 877,9	13 597,1	1076,5

Note - Source: the program of territorial development of Atyrau region for 2016-2020 [4].

In Atyrau air there are many pollutants in comparison with the countryside. As a result of radiation cooling in the streets and buildings, especially in the city center, the upper layer of the city air is warmed up, the temperature changes. Due to the weather changes, a dome-like cloud closes over the city, which affects the human body.

For example, on April 10 this year, the Atyrau Department of Ecology together with Kazgidromet received sampling criteria for atmospheric air to determine the sources of hydrogen sulfide. Atyrau region branch of "Kazgidromet" has received three dimensions of the gas turbine: Atyrau-Uralsk: methane-76,1 mg / m<sup>3</sup>; Atyrau-Uralsk, ANU Substation: sulfur dioxide - 0,0004 mg / m<sup>3</sup>; Atyrau - Russian highway, Tuhlaya balka: hydrogen sulfide was -2.01 mg / m<sup>3</sup>. In general, in 2017, 357 cases of high pollution and 75 cases of extremely high levels of hydrogen peroxide have been registered in Atyrau [7].

At the same time, man-made disasters are the predominant types of soil anthropogenic degradation, as a result the complete or partial removal of soil cover. They are connected with the uncontrolled movement of vehicles, exploration and development of oil and gas fields, construction of communication and power lines, various construction and assembly works, alienation of industrial and domestic wastes, storage of quarries.

Atyrau is located on the coast of the major water reservoir, in the context of unfounded environmental policy, it leads to an increase in pollution of the sea shore and destroys the marine ecosystems and thus adversely affects people's health.

The problem of pollution the Caspian Sea with oil and oil products, which is connected with the proximity of oil fields, is the main one. Particularly, contamination is due to leakage of the Edil and Ural rivers. Annually, 77,000 tonnes of hydrocarbons flow from the Edil river into the sea. Coastal pollution by oil wastes badly affects plankton, flora and fauna.

The pollution of the Caspian Sea leads to the death of many rare fish and other living organisms. Mass deaths of water birds and seals have become widespread. The health of residents of the oil-producing regions is seriously damaged. On the coast of the Kazakhstani part of the Caspian Sea there is massive desertification, there are strong and very strong desertification in the oil fields.

Mass death of birds in the Kazakh sector of the Caspian Sea was registered in October 2013. Then on the artificial islands of the Kashagan field, migratory birds - sloppy dogs, cobbles, bulls, quails - died for unknown reasons. Agip KCO paid for one million and a half million volts for dead birds.

Massive Caspian seals mass deaths have occurred due to the use of many drilling rigs around the Caspian Sea and pollution of marine water with harmful emissions as a result of exploration drilling on the seafloor. In April-June 2000, the massive Caspian seals' catastrophic crash took a wider role compared to last century.

Dead animals were first discovered in the basins of the island and in the waters of the North Caspian Sea and then in the western part of the Middle and Southern Caspian. According to ecological organizations, the number of dead seals in the North Caspian islands, the coastal zone of Kazakhstan, Russia (Dagestan) and Azerbaijan is about 25-30 thousand. Since then, the destruction of seals, as well as the destruction of sturgeon, birds, and fish have been repeated every year.

More than two thousand sturgeon fish and 337 seals flowed to the coast of Mangistau region. Experts say that another 10 percent of the oil pollution in the North Caspian Sea may cause to damage the ecosystems in the region. Kazakhstan part of the Caspian Sea is an ecological system that is vulnerable and sensitive to external factors. The impact of pollutants on the ecosystem here is 100 times stronger than the rest of the sea.

Kazakhstan is obliged to take special measures to restore sturgeons, caspian seals, migratory birds. On the lower banks of the Ural river, the level of natural reproduction of sturgeons is inadequate. In recent years, the number of sturgeon has been decreasing as a result of increased fisheries, breeding cases and expansion of poaching.

Most people in Atyrau region are workers who have no professional relationships with oil and other toxic and carcinogenic chemicals that affect the environment and the people health. As a result of demographic problems, the negative impact of oil and oil products on human organisms can be several times higher[11].



According to recent demographic surveys, the birth rate, death rate and population growth rates have deteriorated: the number of Atyrau region population on January 1, 2018 was 620551 people, including rural 323660 (52.1%), urban population - 296891 (4.9%).

The number of patients due to the increase in emissions of harmful substances in Atyrau region increases. 2011-2017 due to the dynamics of population morbidity in Atyrau and Atyrau region, respiratory diseases, circulatory system organs, digestive organs, genital organs diseases, and infectious diseases are dominant.

According to the results of 2017, the incidence of diseases, diseases of the circulatory system, respiratory system, urogenital system has increased as compared with 2016. There is an increase in blood and blood flow diseases in the region's population. The most common infectious diseases are "A" viral hepatitis, acute intestinal infections, tuberculosis. At the same time, tuberculosis morbidity remains high.

Table 3 - Main diseases of the population for 2011-2017 (per 100 thousand people):

Name of classes and individual illnesses	2011 y	2012 y	2013 y	2014 y	2015 y	2016 y	2017 y
All diseases	31953,3	31753,7	29481,6	28451,4	28780,3	31203,8	32356,6
Including:							
Blood circulatory system diseases	2229,7	2115,8	1722,7	1610,1	1679,6	2140,6	2308,2
Diabetes mellitus	136,0	190,7	182,5	175,2	140,6	141,6	147,9
Tuberculosis	107,5	102,0	90,6	84,7	78,6	66,2	63,2
Cancer	133,2	124,4	145,9	163,9	178,7	138,6	139,1
Muscle-muscular system diseases	546,7	447,2	478,2	527,4	546,3	605,7	679,6
Injury and poisoning	2172,6	2420,9	1917,9	1835,6	1896,3	2085,0	2169,2
Note - Source: Ministry of Health of the Republic of Kazakhstan Atyrau region Department of Medical Payment Services» account data [5].							

In addition, the prevalence of diseases among children and adolescents is widely analyzed. The structure of common diseases is related to the ecological situation. Comparing the infant mortality rate in Atyrau and Aktau shows that the total number of sick children in Atyrau is much higher than in Aktau. The pathology of children under the age of 14 includes respiratory diseases, parasitic diseases, diseases of the skin and subcutaneous tissue, nervous system and taste organs, digestion, as well as injuries and poisonings.

**Conclusion.** According to many researchers, the state of ecosystems in Atyrau region is characterized by a crisis. In the absence of a set of safeguards, the region may have an ecological catastrophe not only for this region, but also at the global level.

In order to provide the needs of the present generation and to preserve these opportunities for future generations, it is necessary to move towards sustainable development of the city, industry, energy, agriculture, transport, create and implement high-performance environmental protection techniques and tools. The transition to a sustainable development model is a long and complicated process that is caused by many conflicts.

Thus, in order to ensure sustainable development of the Atyrau region, it is necessary to work systematically to improve the economy, the environment, public health and social welfare of society.

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#### **АТЫРАУ ОБЛЫСЫНЫҢ ЭКОНОМИКАСЫНЫҢ ҚОРШАҒАН ОРТАҒА ӘСЕРІН ТАЛДАУ**

**Аннотация.** Аталған мақалада Атырау облысының әлеуметтік-экономикалық дамуы, аймақтың экономикалық дамуының басым бағыттары және оның қоршаған ортаға тигізетін әсері туралы мәселелер қарастырылған. Қазақстан бойынша Атырау облысы ірі мұнай және газ кен орнымен ерекшеленеді. Облыстағы экономикада басым сала энергетикалық, құрылыс материалдары, агроөндіріс пен балық өндіру саласы жақсы дамыған. Осы негізде тұрақты дамуға жаңа базалар құрылуға: әлеуметтік инфрақұрылымды жақсарту, жаңа жұмыс орындарын құру, жергілікті тұрғындарды максималды жұмыспен қамту, кадрлар дайындау жұмысы атқарылуда. Алайда облыс республикадағы экологиялық қолайсыз аймақ қатарында ерекше аталады. Аймақтағы экологиялық жағдайды табиғи климаттық, антропогендік факторлар мен мұнай және газ өндірісінің қарқынды дамуын қалыптастырады. Әлемдік деңгейдегі мәселелердің бірі – мұнай өндірісінен пайда болатын қалдық

өнімдерінің қоршаған ортаны ластауы. Осыған орай, бұл мәселені шешуге, бүгінгі таңда үлкен назар аударылуда. Себебі, жоғарыда айтылып кеткен ластаушы көздер қоршаған ортаға әсерімен қатар, адам ағзасында туындайтын қайтымсыз әсерлерге, түрлі ауруларға шалдықтырады. Мақалада аймақ бойынша мұнай өнімдерінің сыртқы қоршаған ортаға тигізетін зардаптарына, тұрғылықты халықтың денсаулығына тигізетін әсеріне, Каспий теңізінің қазіргі жағдайына талдау жасалған.

**Түйін сөздер:** әлеуметтік-экономикалық даму, өнеркәсіптік даму, экономикалық қызмет, мұнай-газ кешені, экологиялық апат, экожүйе жағдайы.

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## АНАЛИЗ ВЛИЯНИЯ ЭКОНОМИКИ АТЫРАУСКОЙ ОБЛАСТИ НА ОКРУЖАЮЩУЮ СРЕДУ

**Аннотация.** В статье рассматриваются вопросы социально-экономического развития Атырауской области, приоритетные направления экономического развития региона и его влияние на окружающую среду.

Атырауская область - крупнейшее нефтегазовое месторождение Казахстана. В экономике региона хорошо развиты энергетика, производство строительных материалов, сельское хозяйство и рыболовство. На этой основе создаются новые основы устойчивого развития: улучшение социальной инфраструктуры, создание новых рабочих мест, максимальная занятость местного населения, подготовка квалифицированных специалистов. Однако регион назван самым экологически неблагоприятным регионом страны. Экологическая ситуация в регионе формируется климатическими, антропогенными факторами и интенсивным развитием нефтегазодобычи. Одной из глобальных проблем является загрязнение окружающей среды отходами нефтедобычи. В связи с этим сейчас уделяется большое внимание решению этой проблемы. Это связано с тем, что загрязняющие вещества, упомянутые выше, помимо окружающей среды наносят вред организму человека и приводят к различным заболеваниям. В статье анализируется влияние нефтепродуктов на окружающую среду, на здоровье населения и состояние Каспийского моря.

**Ключевые слова:** социально-экономическое развитие, промышленное развитие, экономическая деятельность, нефтегазовый комплекс, экологическая катастрофа, экосистема статус.

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