



ANALYSES OF GREEN ECONOMY AND GREEN POLICY IN KAZAKHSTAN

ANALYTICAL REPORT



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1 SUSTAINABLE DEVELOPMENT AND GREEN ECONOMY IN KAZAKHSTAN

Kazakhstan begun to take steps the steps to transition to a green economy. Kazakhstan has set the goal that its transition into the green economy will increase GDP by 3%, and create more than 500 thousand new jobs.

Kazakhstan's green economy concept policy, adopted in 2013, aims to diversify the economy through careful use of natural resources. The project began in 2015 and is expected to continue through 2018.

In June 2014, the Kazakh government set tariffs for energy produced by renewables in a bid to get three percent of electricity from cleaner sources by 2020. Kazakhstan plans to spend an average \$3.2 billion a year along with investors to achieve its green goals by 2050 and cut carbon emissions by 40 percent in 2050 from 2012 levels.

The strategy for the transition to a green economy will include addressing water issues, energy efficiency, desertification, green energy development issues, urban planning, regional development, agricultural rehabilitation and modernization, reducing the effects of environmental pollution, macroeconomic indicators and institutional development. The transition to a green economy in Kazakhstan is based on the principles of increasing productivity of resources (water, land, energy), minimizing the burden on the environment, using alternative sources of energy (sun, wind), forming an environmental culture in business and among the population.

The Kazakh Ministry of Energy together with the Development Programme (UNDP) launched a joint program tackling country's electronic waste problem. The project aims at helping to improve the efficiency of services for collection, transportation, use, and disposal of this type of waste. Also, in order to reduce carbon emissions, Kazakhstan and the UNDP implement a project named **"Sustainable Cities for Low Carbon Development"**. The program covers 15 cities of Kazakhstan.

Kazakhstan actively attracts foreign investments to finance and develop green project in the country. For example, in late 2016 the European Investment Bank (EIB) signed two financing contracts for EUR 150 million and EUR 50 million that will help to implement the **"Concept for the Transition of the Republic of Kazakhstan to a Green Economy."**

As part of President Nazarbayev's broad **Kazakhstan 2050 Strategy** initiative, which is designed to modernize and diversify the nation's carbon-reliant economy, renewable and alternative energy sources will provide 50 percent of all electricity produced in Kazakhstan by 2050, according to a Decree signed by Kazakh President Nursultan Nazarbayev on May 30, 2013. The clear guidelines for the new economic model are presented in the messages of the Head of State **"Strategy "Kazakhstan – 2050": the new political course of the state"** and **"Nurly Zhol - the way to the future"**. The reorientation of Kazakhstan's economic policy is associated with support for those sectors of the economy that create the greatest multiplier effect for economic growth and employment. The basis of the economic program "Nurly Jol" is the Infrastructure Development Plan, designed for 5 years, where more than 100 foreign companies intend to participate with the state share - 15%. The funds will be used for further transformation of the economy - the development of transport, energy, industrial and social infrastructure, small and medium-sized businesses, the introduction of environmentally friendly technologies.

One of the priority directions of the development of a green economy is the development of renewable energy sources. According to the concept, the country targets to achieve a three per cent share of renewable energy in total electricity by 2020.

Kazakhstan has indicated it will use one third of its wastes to generate 'green' energy by 2050.

In 2013, two wind power plants were put into operation in North Kazakhstan. In 2014 Zhambyl region (South Kazakhstan) will have two wind power stations. KazAgroFinance has adopted a program on financing of renewable energy production in the remote villages of Kazakhstan. In 2013 Kazakhstan adopted legislation establishing feed-in tariffs for renewables, which will be in place for 15 years in order to encourage investment in the sector. In January 2014 BISOL Group completed the installation of a 2 megawatt ground mounted solar power plant in the city of Kapchagay in the Almaty Province, the largest photovoltaic system in the country so far.

Kazakhstan takes measures to develop a comprehensive legal framework for the country's transition to a green economy. President Nursultan Nazarbayev signed the law **“On introducing amendments and addenda to some legislative acts of Kazakhstan on the transition to green economy”** in April 2016. In July 2016, the law came into force. Its main areas of application include waste, electric power industry and water resources.

The strategic development of the Republic of Kazakhstan is based on a new stable and efficient model of the economy, implying the country's transition to a “green” path of development. At the international level, in June 2012 at the Conference on Sustainable Development "Rio + 20" the President N. Nazarbayev of the Republic of Kazakhstan announced following initiatives: Green Bridge Partnership Program, Global Energy and Environmental Strategy. “Green Bridge” partnership program includes five priority sectors reflecting the common needs of "green" development in the countries of the Eurasian continent: water resources management; Access to renewable energy; Food security and agriculture; Sustainable urban systems, resistance to climate risks. Kazakhstan created a multilateral, cross-sectoral and voluntary Partnership Programme “Green Bridge” to provide a stable and long-term basis for green investment, transfer of new technologies and innovations to create sustainable economies and create new and long-term green jobs.

On November 20, 2013, Foreign Minister Erlan Idrisov met with heads of the European Union urging the EU to become a member of the Green Bridge Partnership. If the EU joined, it would help spark innovation in green technology and with water conservation like the Aral Sea. As of November 2015, the GBPP Charter was signed by 14 countries and 12 NGOs.

Kazakhstan will host the 2017 World's Fair. The Astana EXPO 2017 has the theme Future Energy and its framework will support Astana's development of a sustainable green economy.

The EU, UNDP and UNECE launched a joint project **“Supporting Kazakhstan’s transition to a green economy model”**. The project is supported by the EU with 7,1 million Euros budget and is targeted to bring water governance in Kazakhstan align with the Green Economy Strategy of the country.

On November 18, 2014 the Chairman of the Board of the Samruk Kazyna Real Estate Fund Bolat Palymbetov announced at a Central Communications Service (CCS) press briefing that the construction of a residential area using green technologies had begun in Astana. The Green Quarter is a residential and office complex that incorporates advanced technologies. The architectural concept of a green quarter was developed by British company AEDAS, one of the world’s largest architectural firms. An advanced system aimed at reducing water and energy consumption by 20 percent to be installed at the facilities. According to preliminary estimates, the project will cost 44 billion tenge (\$US240 million).

Kazakhstan was the first EBRD country to sign up for **the EBRD Sustainable Energy Action**

Plan. The EBRD has invested over US\$650 million in energy efficiency projects in Kazakhstan in corporate energy efficiency, credit lines to partner banks for on lending to the private sector, cleaner energy production, renewable energy, and municipal infrastructure energy efficiency. Energy savings from projects financed by the EBRD so far amount to about 10 per cent of the country's use of electricity. As a result of these projects, Kazakhstan reduced its greenhouse gas emissions reductions amount by 3,885 kilotonnes per year.

The East Kazakhstan region and EBRD collaborate in financing two energy-saving projects in the region. The funding goes to the replacement of street lighting with energy-saving bulbs. The implementation of the project is expected to let the region save its spending on lighting by 60%.

Kazakhstan plans to commission 106 facilities generating energy from renewable energy sources by late 2020. Kazakhstan will commission 28 solar power plants with the capacity of 713.5 megawatts in Almaty, Zhambyl, Atyrau, Karaganda, Kyzylorda, South Kazakhstan and Mangistau provinces. Energy from renewable sources increased by 32 percent year over year in 2017.

By mid-2016 the installed capacity of renewable energy facilities in Kazakhstan increased by 1.4 times compared to the same period of 2015 totaling 251.55 megawatts.

According to the Ministry of Energy, Kazakhstan created a regulatory framework and technical instruments allowing the country to integrate renewable energy sources into the national energy mix until 2020. As of September 2016, Kazakhstan already had 48 operating renewable energy facilities with a total capacity of 252.37 MW (hydroelectric power plants - 122.99 MW; wind power plants - 71.87 MW; solar power plants - 57.16 MW; biogas units - 0.35 MW).

In 2013, Kazakhstan adopted **Green Economy Concept policy** that sets effective water management as a priority in the transition to a green economy. The concept led to the joint project, **“Supporting Kazakhstan’s Transition to a Green Economy Model”**, developed by Kazakhstan in close cooperation with the UN and EU. The project aims to introduce new, effective ways of water infrastructure management, economic instruments of water supply and sanitation, and sustainable agriculture practices.

Kazakhstan's Ministry of Energy and the World Bank launched in January 2017 a new project aimed at designing and developing Kazakhstan's greenhouse gases (GHG) electronic reporting platform. The electronic platform (or “cadaster”) will enable the online submission of GHG data by Kazakhstan's major emitters. The project is expected to help create an accurate and reliable GHG database.

1.1 Legislation and regulatory documents on Ecology in Kazakhstan

Fundamentals of state policy in the field of environmental protection were laid in the **Concept of Environmental Safety**, approved by the decree of the President of the Republic of Kazakhstan N.A. Nazarbayev on April 30, 1996. Within the framework of the Concept, environmental priorities of the transition period were considered, in particular environmental problems of privatization, the issues of the need to create a system of environmental legislation, state control and expertise, economic mechanisms of nature management, environment. Serious changes have taken place since the adoption of this Concept in the public development of the Republic of Kazakhstan. Strategic documents for the development of the state have been developed, the basis for environmental legislation has been created, a number

of international conventions on environmental protection have been signed, and a system for environmental management and environmental protection has been established. So, in 1997, the laws of the RK **“On Environmental Protection”**, **“On Specially Protected Natural Territories”**, **“On Environmental Expertise”**, in 1998 – **“On Radiation Safety”**, in 2002 – **“On the Protection of Atmospheric Air”** were adopted. There are Presidential decrees having the force of the Law in the field of rational nature management, **“On Subsoil and Subsoil Use”** (1996) and **“On Oil”** (1995), in 2003 - **Forest, Water and Land Codes**. A major part of the necessary subordinate regulatory legal acts has been developed and approved, which reflect various issues of public administration and financing in the field of environmental protection, use and reproduction of natural resources. The adoption of the Environmental Code of the Republic of Kazakhstan was a major milestone in the development of the state's policy aimed at protecting the environment, which provides for an international standardization of environmental principles and requirements in Kazakhstan [1].

Long-term priorities and the program of actions of the republic are reflected in the "Concept on the transition of the Republic of Kazakhstan to the “green economy” of May 30, 2013, No. 577.

Now, the current legislation of the Republic of Kazakhstan is aligned with the Concept on the transition of the Republic of Kazakhstan to a "green economy", the transition to institutional mechanisms that improve the environment and the ecological quality of life: indirect economic efficiency, ensuring broad access of the population to clean water and sustainable land resources. There are some amendments to the Land Code of the Republic of Kazakhstan, The Water Code of the Republic of Kazakhstan, the Environmental Code of the Republic of Kazakhstan, the Law of the Republic of Kazakhstan "On Subsoil and Subsoil Use", as well as the Tax Code of the Republic of Kazakhstan, the Code of Administrative Offenses related to them; Entrepreneurship Code of the Republic of Kazakhstan.

New laws of the Republic of Kazakhstan are adopted: **“On the production of organic products”**, 2015 and **“On pastures”**, 2017.

Currently, at the level of the state, an active policy is being implemented to stimulate the conduct of business taking into account the needs of the environment.

The joint EU / UNDP / UNECE project "Kazakhstan's support for the transition to the Green Economy model" is implemented with the financial support of the European Union. The implementing partners are UNDP and UNECE. The national partner is the Committee on Water Resources of the Ministry of Agriculture of the Republic of Kazakhstan. The project will contribute to the implementation of the Green Economy Concept of Kazakhstan with a focus on: the water sector and climate change; Demonstration of quick and practical solutions through pilot actions. The duration of the project is 2015-2018.

1.2 Legislation and regulatory documents on Food Safety of products in Kazakhstan

Legal regulation of relations in the field of quality and safety of foodstuffs in the republic of Kazakhstan is carried out in accordance with a line of legislative acts and regulatory documents, and also technical regulations of the national and customs union within the framework of the customs union. These include:

- 1) Law of the Republic of Kazakhstan of July 21, 2007 No. 301-III ZRK "On food safety";
- 2) Law of the Republic of Kazakhstan "On the quality and safety of food";
- 3) Law of the Republic of Kazakhstan dated June 27, 2011 No. 443-IV ZRK "On Ratification

of the Agreement on Common Principles and Rules of Technical Regulation in the Republic of Belarus, the Republic of Kazakhstan and the Russian Federation;

4) the Code of the Republic of Kazakhstan "On the health of the people and the health care system";

5) Resolution of the Government of the Republic of Kazakhstan No. 158 dated February 19, 2008 "On approval of the Rules for the approval of processes (stages) for the development (creation), production (manufacture), turnover, utilization and destruction of food products by authorized bodies, conformity of machines of equipment, materials and products, Used in the development (creation), production (manufacture), turnover, disposal and destruction of the requirements established by the legislation of the Republic of Kazakhstan on food safety ";

6) Technical Regulations of the Customs Union of the Customs Union of the Republic of Tajikistan 021 \ 2011 "On Food Safety". Decision of CCC No. 880 of 9 December 2011;

7) Technical regulations of the Customs Union TR TS 022 \ 2011 "Food products in terms of labeling" Decision of the CCC No. 881 of December 9, 2011;

8) Technical Regulations of the Customs Union of the Customs Union of Trade Unions TC 005 \ 2011 "On Packaging Safety" Decision of the Commission of the Customs Union No. 769 of August 16, 2011.

9) Sanitary rules "Sanitary and epidemiological requirements for food production facilities". Resolution of the Government of the Republic of Kazakhstan as of February 3, 2012 No. 200;

10) Sanitary rules and norms "Sanitary and epidemiological requirements for storage conditions and the timing of the implementation of perishable food". Order of the Minister of Health of the Republic of Kazakhstan from September 24, 2010 №775.

If the international agreement ratified by the Republic of Kazakhstan establishes other rules than those contained in the Law of the Republic of Kazakhstan "On Food Safety", the rules of the international treaty are applied.

The safety of food products is defined as the absence of unacceptable risk in all processes (at stages) of development (creation), production (manufacture), turnover, utilization and destruction of food products associated with causing harm to human life and health and violating the legitimate interests of consumers, taking into account the combination of probability implementation of a dangerous factor and the severity of its consequences.

Requirements for the safety of food products and the processes (stages) of its development (creation), production (manufacture), turnover, disposal and destruction, established by the legislation of the Republic of Kazakhstan on food safety, are mandatory for implementation by the entities.

State regulation in the field of food safety includes the following areas:

- 1) State regulation in the field of food safety;
- 2) State registration of food products;
- 3) Confirmation of food safety;
- 4) State control and supervision of food safety;
- 5) Monitoring of quality and safety of food products, public health.

Hazard Analysis and Critical Control Points (HACCP) in Kazakhstan

The HACCP food safety system (risk analysis and critical control points) is recognized as an effective tool for food safety at the enterprise level.

The basic sources defining the principles of the HACCP system worldwide are the guidance documents of the United Nations Commission "Codex Alimentarius Commission" (Joint Commission of the Organization of Food and Agriculture and the World Health Organization).

HACCP is a concept that provides for the systematic identification, evaluation and management of hazardous factors that significantly affect product safety. This system provides control at all stages of food production, at any point in the production, storage and sale of products where dangerous situations can arise and is intended primarily for food manufacturing enterprises.

1.3 Legislation and regulatory documents on Land Management in Kazakhstan

There following Policy making bodies in the sector of Land Management in Kazakhstan:

1. Ministry of Agriculture of Kazakhstan Republic – the state body responsible for creating conditions for improving the competitiveness of agriculture, sustainable development, water, fisheries and forestry.

2. Research Institute of Transport and Communications – the private entity with focus on transport technologies, their impact on the environment and measures to improve environmental conditions.

3. Scientific – Production Centre of Land Cadastre – the state body creating normative documents, acts and activities aimed at improving the soil and land conservation.

4. Committee for Construction, Housing and Utilities and Land Management – the state body responsible for implementation of unified state policy in the field of land management and the regulation of land relations.

5. State Research and Production Centre for Land Management – the public body automatically generating a data Bank on land parcels in the country.

At the present stage, the main direction of the implementation of land policy is realization of the provisions of the **Land Code of Kazakhstan Republic**. This also includes the implementation of activities of state and branch programs aimed at improving the management of land resources, regulation of land relations, to ensure rational use of land, soil conservation and protection of land resources.

The Committee for Construction, Housing and Utilities and Land Management and its land planning and topographic-geodesic companies carry out specific activities for the rational use and protection of land resources. These activities include following:

- Creation and maintenance of state land cadaster and the improvement of the automated information system;
- Registration of land plots to citizens and legal entities for different purposes,
- Improvement of the development of paid land use and land market,
- Study of the state of soil and vegetation,
- Mapping of land and provision of the necessary geodetic products,
- Land monitoring management,
- Implementation of state control over observance of the land legislation,
- Implementation of land management and many other types of work required in the modern world are going now.

There is **State Program of Agroindustrial Development of Kazakhstan Republic on 2017-2021**. One of the main tasks of the Program is to create the conditions for the efficient use of land resources. According to the State Program of Agroindustrial Development to ensure the effective use of land resources in the agro-industrial complex, the availability of relevant and reliable information on the quantitative and qualitative characteristics of agricultural land has the key importance, which is expressed in the formation of information from the State Land Cadaster and the data bank on the agrochemical status of agricultural land. In addition, the provision of agriculture lands by irrigation water plays the important role.

2 CURRENT STATE OF ECOLOGY, FOOD SAFETY AND LAND MANAGEMENT IN KAZAKHSTAN

Atmospheric Air

Pollution of atmospheric air. Between 1990 and 2015, the bulk of air pollutant emissions in the country are sulfur dioxide and VHF (solid). In 1990, emissions of pollutants (sulfur dioxide, nitrogen oxides, NMVOC, ammonia, carbon monoxide, hydrocarbon and VHF (solid)) from stationary sources to atmospheric air amounted to 4,649.9 thousand tons / year. In 2015, the volume of emissions of pollutants from stationary sources into the atmosphere amounted to 2,180.0 thousand tons/year. The total emissions of 2015 accounted for 44% of total 1990 emissions. At the same time, to save fuel costs and improve the environmental friendliness of emissions, a transfer of vehicles to gas fuel is carried out [2].

In 2009, Kazakhstan joined to the Kyoto Protocol, which determines the order and quotas for emissions of pollutants into the atmosphere. Institutionally, environmental issues are the responsibility of the Ministry of Energy, which is the main body for coordinating all republican activities in this field. In addition to this ministry, the relevant structural subdivisions of other ministries and departments, government bodies, as well as a whole network of civil society organizations, also work within their competence area over environmental issues. The system of ecological expertise, permitting and inspection and inspection work is established.

The implementation of all plans and programs for the development of Kazakhstan, of course, takes into account and inseparable from the overall situation in the global economy. One of the global problems, which have been solved for many decades by scientists around the world, is global warming.

By the Resolution of the Government, Kazakhstan approved the National Plan for the allocation of quotas for greenhouse gas emissions for 2016-2020, developed in accordance with subparagraph 7 of Article 16 of the Environmental Code of the Republic of Kazakhstan, the Rules for the allocation of quotas for greenhouse gas emissions approved by the Government of the Republic of Kazakhstan dated May 7, 2012 No. 586, as well as taking into account the provisions of international treaties of the Republic of Kazakhstan in the field of climate change [3].

Meanwhile, Kazakhstan launched the Discount Program on Raising Public Awareness in the Sphere of Energy Efficient Lighting of the United Nations Development Program (UNDP) and the Ministry of Investment and Development of the Republic of Kazakhstan (MIR RK). It should be noted that the United Nations Development Program has been implementing projects aimed at developing energy-efficient technologies in Kazakhstan for about 10 years.

Soil

Desertification is a significant environmental problem of the republic. The processes of

desertification and degradation are subject to varying degrees of land 70% of the territory of the republic, which is largely due to the natural features of the country.

Out of 188.9 million hectares of pastures of the country, the extreme degree of degradation is observed at 26.6 million hectares. In general, there is a steady tendency to deteriorate the quality of land in the republic: a decrease in the content of humus, biogenic elements, species composition of vegetation, biological productivity. The catastrophic reduction of the Aral Sea was, as you know, the reason for declaring the Aral region a zone of ecological disaster. As a result of the implementation of the Program for the integrated solution of the problems of the Aral Sea area for 2004-2006, The level of the northern part of the Aral Sea reached 41.4 m in the Baltic system, while before the project was launched it was 39 m. At the same time, the area of the water mirror increased from 2606 to 3156.6 square meters. Km, the volume of water - from 17.7 to 25.2 cubic meters. Km, and the degree of its mineralization has decreased from 23 to 12 grams per liter [4].

One of the most unsuccessful in the republic remains the territory of the Semipalatinsk nuclear test site. On behalf of the Head of the State, a Program for the comprehensive solution of the problems of the territory of the former Semipalatinsk nuclear test site was developed, within the framework of which measures are envisaged to return more than 80% of the territory of the test site to economic circulation.

Many works have been done to stop and prevent the process of desertification in Kazakhstan through the implementation of a set of measures aimed at combating land degradation.

Surface and underground water

At present, Kazakhstan's water bodies are excessively polluted by mining, metallurgical and chemical industries, municipal services of cities and represent a real environmental problem.

The state of Trans boundary Rivers emerging in adjacent territories is also of concern, and the waters of these rivers enter the territory of the republic already polluted, which aggravates the ecological situation in the border regions.

The issues of qualitative and quantitative composition of underground and surface waters, which are under environmental stress due to the irreversible withdrawal of natural water, pollution of water bodies as a result of the discharge of insufficiently treated sewage, are also the focus of state bodies. The reason for this situation is that most of the structures and networks of drainage systems of the republic were put into operation or overhauled more than 20-30 years ago. A significant amount of waste water from industrial enterprises (up to 24% in certain cities) goes directly to urban wastewater treatment facilities, with most of the sewage treatment plants working with overload, which leads to a mismatch of wastewater treatment technology with design data. The forecast of water shortage in Kazakhstan can increase by 3 times by 2050.

Biodiversity and specialized territories

The problems of biodiversity conservation are still actually in the republic. Among the rare endemic and relic species that require protection, there are more than 400 plant species and 300 species of vertebrate animals, a significant part of which is on the verge of extinction. To preserve the primordial ecosystems with the whole complex of biological communities, the life cycle of animals and plants, a network of specially protected natural areas has been created, which are standard for natural conditions, flora and fauna. Kazakhstan, as a party to

the Convention on the Conservation of Biological Diversity (Resolution No. 918 of the Cabinet of Ministers of the Republic of Kazakhstan of August 19, 1994), has its obligations to conserve biological diversity. Legislation in the sphere of PAs is based on the Constitution of the Republic of Kazakhstan, the Law of the Republic of Kazakhstan "On Specially Protected Natural Territories".

Kazakhstan has 20 specially protected natural areas, including 10 reserves and 10 natural national parks. There are also 50 reserves, 5 protected areas, 25 nature monuments, 5 protected areas and 5 botanical gardens [6].

Waste

The problem of chemical pollution associated with the widespread use of chemically active substances used by man in the process of economic activity remains a topical issue for Kazakhstan, among which the persistent organic pollutants that slowly degrade in the natural environment and possess the ability to accumulate in a living organism are especially dangerous. A serious problem continues to be the disposal of containers for pesticides and pesticides in connection with the lack of sufficient storage facilities for pesticides and existing specialized disposal facilities for pesticides and containers that are not suitable for use. One of the most significant environmental problems in the country is pollution of land, the source of which is waste from industry, energy, etc.

Over the period of more than 100 years of development of oil and gas fields in Kazakhstan, the ecological situation of areas of the Caspian region has significantly worsened. Particular concern in the areas of oil production is the state of health of the population, four generations of which permanently live in the zone of active pollution of the atmosphere, soil and water resources with oil products. Significant changes in the vital activity of the ichthyofauna of the Northern Caspian are also noted, which is one of the reasons for the decrease in the volume of sturgeon production in 3 times. In addition, the responsibility of our country for stabilizing and improving the environmental state of the Caspian Sea also follows from the need to implement the Framework Convention on the Protection of the Marine Environment of the Caspian Sea, ratified by Kazakhstan on December 13, 2005 (November 4, 2003).

The sectors of the economy in which the largest volumes of production wastes are formed are ferrous and non-ferrous metallurgy and the coal mining industry. In the period from 2000 to 2015, the bulk of the hazardous wastes formed are in mining and quarrying. In 2015, the amount of municipal waste generated per capita was 184.4 kg. The volume of hazardous waste per unit of GDP in 2015 was 588.8 kg / 1000 US dollars. The level of waste generation in 2015 decreased by 25.2% compared to the same period last year and amounted to 254 801.1 thousand tons / year.

In accordance with the Conception on the transition of the Republic of Kazakhstan to a green economy approved by the Decree of May 30, 2013, Kazakhstan's policy in the field of waste management is aimed at developing the sector of waste processing with obtaining products from recyclables.

In order to streamline and systemize the work of the secondary market, the Environmental Code has been amended. In particular, the concept of "separate collection of municipal waste", "secondary raw materials" and the establishment of requirements for secondary raw materials, separate collection and disposal of certain types of hazardous waste, transfer of waste products to secondary raw materials, prohibits the disposal of certain types of solid domestic waste (Further - SDW), mandatory national standards are introduced that

establish qualification requirements for the entities that perform operations for the collection, transportation, utilization, processing and disposal of waste, and E there are requirements for separate collection and disposal of certain types of hazardous waste (electronic and electrical equipment, mercury-containing waste, batteries, accumulators). Also, the Ecological Code of the Republic of Kazakhstan and the Law of the Republic of Kazakhstan "On Local Government Administration and Self-Government in the Republic of Kazakhstan" entrust the local executive bodies with the responsibility of organizing separate collection at the source of their formation, utilization and processing of solid waste. 41 plants for the processing of solid waste are planned to be built in Kazakhstan until 2050.

Renewable sources of energy

At present, there is an increasing interest of Kazakhstani in renewable energy sources. Kazakhstan is chosen as the venue for the international exhibition "EXPO-2017". Its theme is "The Energy of the Future". Now there is an active preparation. It is expected that the exhibition participants in Astana will be 100 countries and international organizations, and the number of visitors will be 2-3 million.

EXPO-2017 is a national project, the greatest opportunity for Kazakhstan to obtain new energy and green technologies. The exhibition will have a beneficial effect on the image of the country, the development of the economy, and will highlight one of the most urgent topics - "Energy of the future", that is alternative and renewable sources of energy that are of concern to the world community.

Astana Expo 2017 aims to collect the best developments in these areas, in order to demonstrate on the local territory within 93 days not only what should be and will be the energy of the future, but also the problems of developing countries related to the needs in it. The leading world experts gathered in Astana will discuss what needs to be done to ensure that "green energy", its availability, environmental friendliness and economy become the main development trend for the coming decades.

2.1 Analysis of environmental situation in Akmola region

Akmola region is located in the northern part of Kazakhstan and borders with Kostanay, North Kazakhstan, Pavlodar and Karaganda regions. The territory is 146.2 thousand km², the average population density is 5 people. / Km² [11.02.01.]. There are 2 cities of regional importance - Kokshetau and Stepnogorsk, 17 rural districts, 8 cities of regional subordination, 5 townships and 253 rural districts in the region. The most part of the territory is occupied by steppes, lowland, weakly dissected and river valleys, mountains covered with forests.

Soils are represented by ordinary dark ground and chestnut, characterized by heavy mechanical composition, increased salinity, and low water permeability.

The climate is sharply continental and extremely arid. Summer is short, warm, long winter, frosty, with strong winds and snowstorms.

Vegetation is represented by steppe species of mixed herbs, pine-birch forests, mixed-grass vegetation, which covers the slopes of the mountains.

The fauna is represented by 55 species of mammals, 180 species of birds and 30 species of fish.

There are about 494 lakes, 111 rivers and temporary gutters, 41 reservoirs, 77 ponds and many other small natural and artificial reservoirs on the territory of the Akmola region.

Several rivers flow through the territory of the region, among them the largest ones: the river Esil, the Nura River, the Koluton River, the Selets River, the Zhabai River, the Chaglinka

River and the Kylshakty River. There are many fresh and salty lakes. Among them Korgalzhyn, Kozhakol, Ittmen Maybalyk, Teniz, Kypshak, Kerey, Kiyakty, Shortandy, Ulken Shabakty, Burabai, Zerenda, Sulukol, Karasu, Sultankeldy, Kopa, etc.

Esil river, Selets river, Chaglinka river are regulated by three reservoirs: Astana, Seletin and Chaglinsky among of the 13 reservoirs available in the area for guaranteed water supply.

The Kokshetau SNPP is located on the territory of the region, as well as the Korgalzhyn Reserve of international importance, which is one of the most unique places on the whole Euro-Asian continent.

The main direction of the region's economy is agricultural and industrial production. The territory of the region is concentrated reserves of gold, silver, uranium, molybdenum, technical diamonds, kaolin and muscovite, as well as iron ore, coal, dolomite, common minerals, mineral waters and therapeutic mud.

Atmospheric air

In the ecological aspect, the territory of the Akmola region is characterized by a prosperous one. There are Shchuchinsk-Borovo and Zerenda resort areas, Korgalzhin reserve and many natural reserves.

Sources of pollution of the air basin of the Akmola region are also enterprises of heat power engineering, mining sector and motor transport.

There are 44 514 units of stationary sources of pollutant emissions into the atmospheric air.

The analysis shows that the emission limits to the atmosphere increase, but the actual emissions are reduced.

So, in 2015, the limited volumes amounted to - 168.318 thousand tons;

In 2014 - 155,748 thousand tons;

Actual volumes of general industrial emissions, in comparison with 2014, slightly decreased:

2015 - 94,3 thousand tons;

2014 - 95.8 thousand tons.

The volume of particulate matter emissions into atmospheric air in 2015 was 56.8 thousand tons, in 2014 - 57.86 thousand tons.

According to sulphurous anhydride: 2015 - 16.54 thousand tons, 2014 - 16.84 thousand tons.

Nitrogen dioxide: 2015 - 3.76 thousand tons, 2014 - 3.83 thousand tons.

Carbon monoxide: 2015 - 16.9 thousand tons, 2014 - 17.24 thousand tons.

According to statistics in the Akmola region, there are 312,496 vehicles.

The following users of natural resources received certificates for greenhouse gas emissions in Akmola region;

RSE on REM Thermo Tranzit (Shchuchinsk);

Open Company "Stepnogorsk thermal power station" (Stepnogorsk);

LLP "Altyntau Kokshetau" (formerly Vasilkovsky);

RSE on REM "Kokshetau-Zhylyu".

Quality of atmospheric air in populated areas.

Concentrations of all pollutants according to observation data were within the permissible norm.

The state of atmospheric air pollution in the territory of the Shchuchinsk-Borovo resort zone (SCBKZ)

Observations of the state of atmospheric air in the territory of the ShchBKZ were conducted at 4 stationary posts.

According to the fixed network observation, the atmospheric air of the territory of the state national nature park (SKFM Borovoye) is generally characterized by a low level of pollution in 2015. The ATMOSPHERIC POLLUTION INDEX was 1.3.

In general, the average concentrations of pollutants in the park did not exceed the MPC. Excess of more than 1 MPCm.r. Weighted particles 2.5 to 174, PM-10-28 weighted particles, carbon dioxide 282, nitrogen dioxide -2, hydrogen sulfide-4 cases, and excess of more than 5 MPCm.r.

There are 2,200 rivers and temporary drains, 552 lakes, 40 reservoirs, 6 excavations, 11 digging, 134 ponds, 57 dams on the territory of the Akmola region.

Natural aquatic ecosystems are the most diverse in biological productivity from the fauna of fresh water to fauna close to marine.

The area is dominated by the biocenosis of lakes, 140 of which are large lakes, the rest have a mirror area of less than 100 hectares. 86% of freshwater lakes have ichthyofauna (crucian carp, perch, chibak, tench, carp, ripus, pike, peled, bream, carp, pike perch, roach, burbot, ide.), 10% salted. 1/3 of the lakes are assigned to water users.

The largest lake is Lake Tengiz. The area of the water mirror is 92,400 hectares, the lake is salty. Another large lake is Korgalzhyn lake, the water mirror area is 33 000 ha, the lake is brackish. The depths of lakes are usually small. Their average depth does not exceed 1-1.5 m.

Within the Akmola region, the largest rivers are the River Esil, the River Koluton, the Zhabai River, the Selets River, the Nura River, the Shagalaly River, the Kylshakty River, and the Tersakan River.

The main water artery of the region is the river Esil with a number of large tributaries flowing in the north from the Kokshetau Upland, and in the south from the jails of the Ulytau Mountains. More than half the area of the Akmola region belongs to the basin of the river Esil, which has an external runoff. In the northern part of the region there is the Shagalaly river, which is the main source of water in the regional center - Kokshetau. The length of the river along the territory of the region is 144 km, the average annual flow is 40770 thousand m³ / year. The remaining rivers have a small length, some of them dry up during the hot months.

The rivers Esil, Seleti and Shagalaly are regulated by three reservoirs among the 40 reservoirs available in the region for guaranteed water supply: the Astana Reservoir (formerly Vyacheslavskoye): a total volume of 410 million m³ is intended for water supply in Astana and irrigated agriculture, and sanitary rehabilitation of the river Esil. Seletinsky Reservoir: has existed since 1966, the total volume of the reservoir is 230 million m³; water is taken for water supply to the population, industrial and budgetary enterprises of Stepnogorsk, Zavodskaya. Chaglinskoye reservoir: in the total volume of the reservoir is 28 million m³. The purpose of use is the centralized khozpetievoe water supply in Kokshetau, irrigation and feeding of Lake Kopa.

There are no discharges to this reservoir

Because of the lack of fresh water for drinking and irrigation purposes, many artificial water systems with fresh water have been built (ponds, reservoirs, pits, digging, dams).

Sharp problems include shallowing and pollution of lakes, excessive recreational load in SNBP "Burabai".

The lack of centralized sewerage and storm sewage systems in settlements and health resorts along the shores of lakes and rivers entails the construction of numerous local waste water collectors (cesspools), which often creates a threat of overflow and pollution of the environment, including water resources.

The main components polluting groundwater are: cadmium, lead, barium, manganese, bromine, phenol, boron, oil products. Земельные ресурсы

According to the information of "Entrepreneurship and Industry Department" during the reporting period LLP "Dena KZ" and "NGO JNA" LLP, recultivated subsoil use plots by liquidating and restoring the disturbed lands in the amount of 53.3 ha.

Together with the Environmental Prosecutor's Office of the Akmola region, an audit was carried out for subsoil users to fulfill their contractual obligations in terms of liquidation (reclamation or conservation) of waste subsoil use facilities. The facts of not reclamation were revealed. Administrative fines were imposed on legal entities.

State of soil contamination with heavy metals

During the spring period in soil samples collected in different regions of Astana, the cadmium content was within the range of 0.1-0.2 MAC, copper - 0.1-1.5 MAC, lead - 0.4-0.9 MPC, Zinc - 0,3-0,5 MAC and chromium - 0,2-0,4 MAC.

Bosom

On the territory of the Akmola region, subsoil use contracts have been concluded:

- On solid (ore) minerals - 29;
- for common mineral resources - 179.

During the reporting period, the Office of Entrepreneurship and Industry of Akmola region terminated 20 contracts, of which: upon expiry of the contract - 12; Under the additional agreement - 6; By decision of the Competent Authority - 2 (ahead of schedule).

30 contracts on common minerals concluded.

Specially Protected Natural Areas

On the territory of the Akmola region there are 16 objects belonging to the categories of specially protected natural territories (hereinafter referred to as PAs), including:

3 state national natural parks (hereinafter referred to as SSPP) "Burabai"; "Kokshetau"; And "Buyratau"; Korgalzhyn State Nature Reserve;

4 state natural zakaznik (zoological) reserves without the status of a legal entity;

8 state natural monuments including:

- state nature monuments "Sharp hill" Schlem "area of 2 hectares; "Pond with relic stands" area of 1 hectare; The "halo hill" area of 2 hectares is located in the Enbekshilder district;

-State natural monuments "Zeleny Cape" area of 1.2 hectares; "Smolny Sopka" is an area of 1 hectare; "Sopka strekach" area of 1.3 hectares; "Raspberry cape" area of 0.5 hectares; "Sopka" Fire "area of 1 hectare are located in Zerendinsky district, the total area occupied by the State Natural Monuments is 10 hectares, are under the jurisdiction of the Forestry and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan.

Forest resources in the areas of the State Forest Fund in the long-term forest use for cultural and recreational, tourist and sports purposes on a total area of 4296.1 hectares to 54 business entities provided, as well as for harvesting 176712 hectares to 16 business entities.

On the territory of state forestry institutions there are 23 hunting farms on a fixed area of 315.8 thousand hectares.

There are 10 nurseries on the state forestry institutions. The total area of nurseries is 195 hectares.

State institution "Korgalzhyn state natural reserve"

GU "Korgalzhyn State Nature Reserve" is a specially protected natural area with the status of an environmental and scientific institution. The total area occupied by the Korgalzhyn Reserve in the Akmola region is 281 046 hectares.

In Korgalzhyn state reserve according to the staff list there are 35 state inspectors of the security service, including 3 state inspectors are engaged in the protection of the territory of the Atbasar State Zoological Nature Reserve, which was transferred to the reserve for protection.

There is a problem of shallowing fresh water in the territory of the state reserve. Since 2005, due to the breakthrough of the Kulshum and Tabiak dams, the incoming waters of the Nura and Kulanutpes rivers go to the bitter-salty lake of Tengiz. The level of fresh water bodies for these years fell by 80-100 cm.

The house dams are listed on the balance sheet of the RSA "Astana Su" Akmola region of the Water Resources Committee of the Ministry of Agriculture of the Republic of Kazakhstan.

So far, breakthroughs have not been eliminated, which largely violated the course of natural natural processes, typical and unique ecological systems that caused sea fishes and other violations of animal and flora objects in the territory.

Radiation situation

Observations of the level of gamma radiation were carried out daily at 15 meteorological stations (Astana, Arshaly, Akkol, Atbasar, Balkashino, SKFM Borovoe, Egindykol, Ereymentau, Kokshetau, Korgalzhin, Stepnogorsk, Zhaltyr, Burabai, Shchuchinsk, Shortandy) and 1 automatic post Kokshetau air pollution (№2).

The average values of the radiation gamma background of the atmospheric surface layer over the settlements of the region were in the range 0.006-0.27 $\mu\text{Sv} / \text{h}$. On average, the radiation gamma background in the region was 0.13 $\mu\text{Sv} / \text{h}$ and was within acceptable limits.

Monitoring of radioactive contamination of the surface layer of the atmosphere in the Akmola region was carried out at 5 meteorological stations (Atbasar, Kokshetau, Stepnogorsk, Astana, SKFM Borovoe) by sampling air with horizontal plates. At all stations, a five-day sampling was conducted.

The average daily density of radioactive fallout in the surface layer of the atmosphere in the region varied within the range of 0.6-4.2 Bq / m^2 . The average density of deposition over the region was 1.2 Bq / m^2 , which does not exceed the maximum permissible level.

The radiation situation in the territory of the Akmola region is assessed as stable. The uranium-extracting enterprises of the Soviet period are currently all inactive and mothballed.

Waste

The volume of industrial waste generated by industries in 2015 amounted to 48,982,504 thousand tonnes.

The analysis shows an increase in the total volume of generated industrial waste in 2015 by 6,575.733 thousand tonnes (15.5%) compared to the same period in 2014. The reason for the increase was the increase in excavation of overburden at the largest mining enterprises of the region.

The volume of industrial waste largely depends on the workload of industrial enterprises and on the loading of their production capacities, in this regard, the volume of industrial waste generation can be increased or decreased.

The volume of utilization from the total accumulation of industrial waste by enterprises of the Akmola region amounted to 9,437.753 thousand tons or 19.3%.

Means of Chemicalization

The main branch of the economy of the Akmola region is agriculture, where chemical plant protection products are used.

On the territory of the Akmola region as of January 1, 2015, 224 warehouses of pesticides (pesticides) were registered, of which 8 are standard and 216 are fit.

In 2015, under the subsidy program, "The cost of the cost of herbicides for bioagents (ethnophages) and biologics intended for processing crops for the protection of plants" (SSCP) for the agricultural producers (hereinafter referred to as "SCPTP"), 4.7 million liters of subsidized herbicides of domestic and foreign production was purchased.

Renewable energy sources

A wind power station (hereinafter referred to as WEC) with a capacity of 45 MW near the town of Ereimentau was commissioned in Akmola region, in the 3rd quarter of 2015, according to data of administration of Akmola region. The amount of generated energy in 2015 was 78.9 million kWh.

Directions on green politics

Association of Legal Entities (Coalition) is one of the leading "green" public organizations of Kazakhstan and is a public provider of the Concept of the transition of Kazakhstan to the "green economy".

The coalition together with partners actively involves the country's population in the implementation of advanced reforms in the sphere of the "green economy", the partnership program "Green Bridge" and the national project "Expo 2017".

The Small Grants Program of the UN Global Environment Facility, the Coalition, was awarded the "Sign of Trust" to promote "green projects" at home and abroad in 2014. Geographically and meaningfully, the scale of the "green" practices is very wide, in almost every region of Kazakhstan there are implemented "green" projects, with the example of which regional projects are being implemented today.

The mission of the Coalition is to consolidate the efforts of NGOs, business, science and government to promote the implementation of the principles of green growth, the integrated development of territories based on the ecosystem approach, the green innovation infrastructure, the creation of legal and institutional frameworks for the transition to a green economy.

The main objective is to assist in the implementation of "green" projects in seven key areas of development of the green economy: the introduction of renewable energy sources, energy efficiency in housing and communal services, organic farming in agriculture, improving the waste management system, improving the water management system, preserving And effective ecosystem management.

The main activities of the Coalition are:

☒ promoting the formation of a "green" legal field, by developing and implementing "green" norms, standards and recommendations;

☒ creation and maintenance of rating registers of "green" Kazakhstani companies, a bank of "green" projects, technologies, materials;

☒ the organization of resource-educational centers for teaching "green" innovations and technologies;

☒ To promote the implementation of international and domestic projects that promote the promotion of "green" standards in the modernization of Kazakhstan's economy.

Within the framework of the Nation's Plan "100 concrete steps to implement 5 institutional reforms", 59 laws entered into force, which create a fundamentally new legal environment for the development of the economy in order to enter the first 30 countries - leaders of the 21st century by 2050.

In particular, laws on organic farming, commercialization of innovations, public-private partnerships have been adopted.

Last year the country, so to speak, gained maximum acceleration, now the main thing is

to keep the speed of change achieved.

A feasible contribution to this process will be made by the "Coalition for the Green Economy and the Development of G-Global." In the new 2016, the Coalition will implement the following 10 projects and more than 50 events:

1. The project "Coca-Cola beliesteri" ULO "Coalition for the Green Economy and Development of G-Global" and the Social Fund "Social Dynamics" with the support of Coca-Cola have been implementing a project to support unemployed women for the fourth year in Kazakhstan. Within the framework of the project, rural women are trained in the basics of green business, consultative and methodological support for start-up entrepreneurs, as well as a contest "Coca-cola beliesteri", in which grants are awarded for the implementation of the best business ideas.

Coca-Cola Beliesteri is part of the Coca-Cola 5by20 multi-year initiative, which plans to involve 5 million women around the world by 2020 by providing opportunities to participate in business training, financial knowledge and skills, and Support from like-minded people and curators. For the period of the project in Kazakhstan, 3,500 women were trained, 21 women received grant support, opened their small business.

2. Within the framework of the project, in the course of February-April 2016, it is planned to conduct training in 20 villages of Akmola, Almaty and Karaganda regions, covering at least 2,000 unoccupied rural residents. The training programs include materials on the organization and conduct of specialized business trainings for the opening of small businesses in the countryside using "green technologies", the implementation of "green" business projects in the countryside, etc. The implementation of the Republican competition for a better business idea, Participation of unemployed women in training courses in the basics of business, consulting on drafting business plans, support to financial institutions, and of course participation in the Competition.

3. Project "PR on green economy" ULP "Coalition for" green "economy and development of G-GLOBAL" with the support of the United Nations Development Program in 2016 implements the project "Advocacy of policy on the transition of Kazakhstan to the model of green economy by highlighting the implemented" green "projects , Coverage of issues of energy and water supply in order to create a culture of energy and water conservation in the public mind.

The project is aimed at popularizing the principles of the "green economy" by consolidating the representatives of the republican and regional media working in this direction in a single pool. The "Coalition for a Green Economy and the Development of G-Global" as an advanced public institution for a "green economy" have in their active more than 10 sustainable projects, since the day of creation has been actively working with journalists of different levels. Given that the multiplicative effect of the projects being implemented has a significant role to be played by the delivery of information and proper coverage, regular and fruitful work with media representatives is essential. First of all, it is important to reach a full understanding of the material by journalists who will disseminate a certain message among the broad masses. Secondly, it is necessary to maintain a spirit of competition between "green journalists" and use of tools that stimulate their activity. Therefore, the idea of implementing this project appeared, which will allow not only to prepare a wave of "green journalists", but also make a significant contribution to the effective and holistic coverage of all UNDP projects implemented in Kazakhstan with a view to promoting a "green economy".

Based on the results of the project, the following results will be achieved:

- Info-tours for journalists and bloggers on the implemented pilot projects

- Contest among media representatives on the best work on the topic of "green technologies"
- Organization of the Club of bloggers on the "green economy"
- Release of 2 videos on the use of water saving and energy saving and their rotation in at least 2 national, 4 regional TV channels
- Conducting an international videoconference to disseminate best practices, and online learning with the participation of interested TV channels

Project "Hydrogels and agrovolochno" PF "Green Bridge G-Global" with the support of the United Nations Development Program in 2016 implements the project "Spreading the integrated use of three agricultural technologies - hydrogels, agrofiber to cover the soil and drip irrigation in crop production." Organizational support for the project is provided by the OYL "Coalition for the green economy and the development of G-GLOBAL." Main goal: The project will demonstrate the opportunities for the integrated use of 3 water-saving technologies on the backyards of rural residents, Visually demonstrating the practical possibilities of reducing water costs with a significant increase in the yield of vegetable crops in rural areas of rural residents at least 8 rural areas located in Akmola and Kustanai regions.

Objectives of the project:

1. Create 160 demo sites in 8 rural districts (20 in each locality) with integrated use of technologies, agro-fiber and hydrogel, drip irrigation, which will save 2.5 times water and receive stable high-quality yields of vegetable products.
2. To carry out approbation of possible complex practices and technologies for the development of the best practical experience (drip irrigation - agro-fiber, drip irrigation - hydrogel, drip irrigation, hydrogel-agro-fiber)
3. Conducting a study on the chemical analysis of bottled water in Astana.
4. Spread the positive results of the project in the territory of the Republic of Kazakhstan through popular trainings and seminars, mass media of all levels.

A unique hydrogel from unsaturated polyester resins, developed by the Institute of Chemical Problems at the Karaganda State University, will be tested using domestic technology. This innovation is one of the winners of the first stage of the online-Expo-2017 contest, held in 2015.

4. "Green Kazakhstan" project The ULP "Coalition for the Green Economy and Development of G-GLOBAL" with the support of the United Nations Development Program in 2016 implements the PR promotion project of the "Green Bridge" Partnership Program.

The aim of the project is to work closely with key partners and stakeholders to promote and disseminate the main principles and ideas of the Green Bridge Partnership Program among all segments of the population of Kazakhstan.

Tasks:

1. Development and implementation of a strategy to implement an awareness-raising campaign on the Green Bridge Partnership Program and the Green Economy;
2. Increase of knowledge and awareness of the population on the wide application and effectiveness of "green" technologies;
3. Formation of fundamental foundations for improving the quality of life of the population through the development of social and environmental business;
4. Stimulation of youth to create a "green business" in the regions, monocities, rural settlements.

5. The Green Cafe Project ULP Coalition for Green Economy and Development G-GLOBAL is implementing the Green Cafe project with the support of the United Nations Development

Program in 2016. The Green Cafe is a platform for sharing knowledge in the format of friendly and informal Meetings over a cup of tea between enthusiasts of the green economy in Kazakhstan - experts, NGOs, innovators, entrepreneurs, farmers and representatives of the media, government agencies, business and international organizations. Within the framework of the project, more than 10 invitations will be organized.

The goal of the project is:

- Reaching assistance in development of the concept on transition of Kazakhstan to the "green" economy

- Popularization of "green" practices and innovations implemented in the country

- Creation of a dialogue area

The objectives of the project are:

- Raising awareness of the population of the Republic of Kazakhstan on the implementation of the Concept for the transition to a "green" economy through media representatives

- Involvement of media representatives in disseminating best practices in implemented experiments

- Dissemination of best practices and technologies for a low-carbon economy;

- Creation of a pool of media representatives with "green" thinking.

Center for the dissemination of knowledge "People's Academy of Green Technologies."

In September 2015, in the Arnasay village of Akmola region, the OYL Coalition for a Green Economy and the Development of G-Global, jointly with the partner of the PF "Akbota", with the grant support of UNDP and the Coca-Cola company, the Knowledge Center "People's Academy of Green Technologies ". This is almost the first training center in Kazakhstan on green economy, new technologies with demonstration innovations working. The center enables students to receive practical consultations and skills on adaptation of "green" technologies on the principle "the villagers are taught and demonstrated." Based on the results of comprehensive training in the basics of green economy, green technologies, students receive certificates of the established type.

The park of green technologies "Arnasay". The park was opened in Arnasai village of Akmola region by the efforts of public organizations of the country - OYL "Coalition for Green Economy and Development of G-Global" and Social Fund "Social Dynamics", with the financial support of UNDP and Coca-Cola.

The park has the following technologies:

- Energy efficient windows that save heat and money, ensure a comfortable indoor temperature and good ventilation and sound insulation

- Solar well - Indoor lighting system with natural sunlight. Using this technology allows you not to spend electricity for lighting areas of the building without access to windows.

- Filters for water treatment - Installed filters have a stylish and ergonomic design, high quality at an affordable price, will clean the water of any contamination.

- LED lamps - The main advantage is a quick payback, save energy up to 80%, a lifetime of 36-72 thousand hours, ensures compliance with SanPin in education facilities

- Sensory mixers - The main advantage of the sensor mixers is the saving of up to 300 liters of water per day per one tap, an acceptable price, convenient for operation and long service life

- Solar Panels - Solar Panels manufactured in Kazakhstan by Astana Solar LLC with a capacity of 6 kW. With the help of solar panels, electricity is provided in the phyto-diode greenhouse and partly in the building.

- Pyrolysis furnace - Superheated hot water boiler with multi-stage combustion of flue gases. The saving of coal is up to 30-40%. The burning time is from 2 to 5 days. The installed pyrolysis furnace in the CRZ is the development of the entrepreneur and innovator Petrova (Karaganda)

- Solar collectors - Installed solar collectors are the development of Kazakhstan scientists of the Technopark Nazarbayev University. Feature is the competitive price and high efficiency (up to 90%)

- Solar bioweighting - Total area 300 sq.m. It was built using the technology of the Russian company Green-Peak LLC. Feature is the cultivation of products on organic farming technology

- Phyto-diode greenhouse - Phyto-diode lighting is favorable for plants, save energy up to 80%, is good for health

- Drip irrigation - The method of effective irrigation by adjustable small portions with the help of dispensers-droppers.

Project "Organic Products" OYL "Coalition for" green "economy and development of G-Global" in December 2015 became the owner of voluntary eco-labeling "KZ Organic". The sign confirms that there are no harmful substances in the product marked with this sign, negative environmental effects are absent or minimized throughout the life cycle of the product. The application of this logo to the goods is allowed after signing the contract with the owner of the mark and meeting all the requirements, Established by the legislation. The basic requirements are: the existence of its own environmental policy, compliance with all requirements of national legislation, as well as the continuous improvement of the environmental characteristics of the declared products / services and its quality. It is prohibited to use chemical plant protection products (mechanical, biological agents are allowed). Seed treatment is artificial Chemical conditions. Conditions for livestock products: use of natural fodder (70% organic, 30% organic In conversion). The prohibition on the use of antibiotics. Free-keeping of animals, with grazing. The production of poultry farms and pig farms, cell rabbits will not do. (There is a technology of breeding in a huge pit, where rabbits dig themselves burrows and choose their own couple.)

For products of processing: Organic raw materials - 95%, the remaining 5% - from the permitted list. The ban on the use of additives obtained by artificial means.

Register of green companies. In 2015, the OYL Coalition for Green Economy and Development of G-Global jointly with the Ministry of Energy of the Republic of Kazakhstan held a national virtual competition "on green technologies and innovations".

The project is aimed at stimulating the professional interest of private companies and investors in the field of "green technologies" and innovations, as well as highlighting the activities, experience and results of successful and demonstrative "green" projects, best practices, methods and technologies at the national level.

The competition involved well-implemented and successful "green" projects, in which, in part or in whole, the following were applied: 1) innovations in the field of renewable energy sources;

2) energy-efficient and resource-saving technologies;

3) methods of conservation and effective management of ecosystems;

4) practices for sustainable and high-performance agriculture;

5) effective management practices and waste management;

6) effective technologies for sustainable use of water resources.

7) technologies aimed at reducing emissions of polluted air into the atmosphere.

Also, a register of "green" entrepreneurs "Green Business" was compiled with a view to:

forming a positive public opinion about "green" technologies; Consolidation of "green" entrepreneurs, the creation of a reliable and proven base in the context of the regions.

Competition «Online EXPO-2017. On January 18, 2016, the second stage of the online virtual contest Online Expo-2017 will start. The best projects will be recommended for placement in the Kazakhstan pavilion "Sphere" at EXPO-2017. The competition was announced in five thematic nominations: renewable and alternative energy sources, clean technologies in traditional energy, energy efficiency and resource saving, green chemistry and waste, organic agriculture and water resources. In addition to these nominations, the sixth nomination "Other projects" is announced, which will include educational, institutional and other projects on green technologies, climate and green economy. In each nomination, ten projects will be announced winners.

During the last seventeen years of cooperation, UNDP has supported Kazakhstan in developing key strategic documents at the national and regional levels, developing legislation, institutionalizing and strengthening the institutional capacity of government agencies at various levels. This was accomplished by drawing on the best international experience in these areas and by providing ongoing support for achieving the Millennium Development Goals.

In the field of ecology and sustainable development, UNDP provided broad support to the Ministry of Environmental Protection, the Committee on Water Resources, the Committee for Forestry and Hunting, and other agencies in the development of strategic documents (the Concept for the country's transition to sustainable development, implemented with the assistance of the National Council for Sustainable Development) And bills (such as the Environmental Code adopted by the Decree of the President of the Republic of Kazakhstan). UNDP supported the ratification of international treaties (Stockholm Convention on Persistent Organic Pollutants) and reporting (3 National Communication on the Implementation of the Convention on Biological Diversity in Kazakhstan, the first national report on the Ramsar Convention on Wetlands). A draft of the National Integrated Water Management Plan was developed and model basin councils were established in eight river basins. More than 30 small projects in the field of environmental protection and energy efficiency were implemented by non-governmental organizations and organized local communities. UNDP also supports disaster risk assessment in the disaster-prone Almaty region and helped develop disaster preparedness training programs and trained target groups.

2.2 Analysis of environmental situation in the Western Kazakhstan region

The region is located in the western part of the republic; the center of the region is located in the city of Uralsk, which is on the river Zhayik. There are 12 districts and 2 cities, 3 settlements, 148 rural and village districts in the region, the urban population is 312.3 thousand people (49.6%), rural - 317.6 thousand people (50.4%). The average population density in the region (for 1 km² of the territory) is 4.1 people.

The terrain is flat. In the north and northeast of the region, there are spurs of the General Syrt and the Ural plateau. In the south, within the Caspian lowland, there are sandy massifs of Narynkum: Kokozenkum, Akkum, Karagandykum and others.

There are deposits of oil, gas, oil shale, potassium-magnesium salt, expanded clay and other natural resources.

The climate of the West Kazakhstan region, which located at the junction of the continents of Europe and Asia, is distinguished by a high continentality, which increases from the north-west to the southeast. High continentality manifests itself in sharp temperature contrasts of day and night, winter and summer, in a rapid transition from winter to summer.

The whole region is characterized by instability and deficiency of atmospheric precipitation, great dryness of air and soil. Winter is cold, but not long, and summer is hot and long.

The annual amount of precipitation varies from 330 mm in the northeast of the region to 200 mm in the south. The Zhaiyk River (Ural, a total length of 2,428 km, within the limits of Kazakhstan -1,082 km) flows along the territory of the region. Soils are dark chestnut, light chestnut clay, solonchaks. Gramine-motley grass, cereal-wormwood, wormwood-birch vegetation predominates. On the floodplains of Zhaiyk and other rivers, poplar, aspen, elm, oak, willow and other shrubs are growing.

The area of settlements is 2 323.6 thousand hectares. Lands of industry, transport, communications, defense and other non-agricultural purposes are located on an area of 37.7 thousand hectares. The lands of specially protected natural areas are 12.4 thousand hectares. The forest fund lands are 215.5 thousand hectares. The land of the water fund is 75.5 thousand hectares. The reserve lands make up 5 732.3 thousand hectares. In addition, the lease of the Russian Federation granted 1 465.1 thousand hectares. Most of the land fund of 13,919.4 thousand hectares (92%) is represented by agricultural land. The agricultural land is 5,271.8 thousand hectares. The number of subsidiary farms of state enterprises is 18 farms with a total area of 5.0 thousand hectares.

There are 19 other state-owned enterprises, which occupy an area of 47.9 thousand hectares [01.11.2014].

Atmospheric air

The main polluters of the air basin of the West Kazakhstan region are oil and gas complex enterprises, boiler houses, motor transport, elevators, which discharge atmospheric nitrogen oxides, carbon, sulfur dioxide, hydrogen sulfide, volatile organic compounds and inorganic dust. The dynamics of emissions of harmful substances into the atmosphere is presented in *Table 1. The volume of emissions of pollutants into the air*

Information on pollution	2015	2014
volume of general industrial emissions in atmospheric air, thousand tons	38,478	44,7
volume of sulfur dioxide emissions in the atmospheric air, thousand tons	7,198	8,2408
volume of nitrogen dioxide emissions into the atmospheric air, thousand tons	2,742	3,0101
Volume of particulate emissions into atmospheric air, thousand tons	0,410	0,4162
Volume of carbon monoxide emissions in the atmospheric air, thousand tons	4,877	5,5103
Emission from gas combustion, thousand tons	4,355	5,868
Volume of industrial emissions to atmospheric air without treatment, thousand tons	33,945	42,465
Including the volume of emergency emissions, thousand tons	0,179	-

Analysis of the data in Table 2 shows that in 2015, the reduction of harmful substances emissions in comparison with the same period of the previous year occurred in Intergas Central Asia, a branch of Intergas Central Asia JSC (13%), JSC Condensate (56%), KPO b.v. (By 20.4%), Ural Poultry Factory LLP (by 37%), ZKKSM JSC (by 72.3%).

The increase in emissions is observed in Zhaikmunai LLP (by 16.6%), KazTransOil JSC Western branch of the Ural Oil Pipeline Administration (16%), Batys Su Arnasy LLP (15.4%), GKP Aksayzhylukuat (By 15.2%), JSC "Zhaiykhylukuat" (by 27.0%).

Table 2. Emissions by enterprises

Enterprises of region	Allowance tons/year	Actual volume, tons/year
SCE "Aksayzhylukuat"	280,5381886	255,06223441
RSE "Institute of Nuclear Physics"	449,8	447,9
LLP "Eco Plus"	1624,432	1624,432
LLP "Batys Su Arnasy"	13,818506088	13,3696
LLP BELES-AGRO	44,768567	25,020532
UMG "Uralsk" CJSC Intergas Central Asia "	216354,116	14490
RSE "Kazahavtodor"	108,30333	46,9277
LLP "134"	19,340219	8,989456
LLP "Kainar - M"	4,493117987	4,477392073
JSC Condensate	793,033	199,449
LSC Oral zholdary	4,6839145	3,988122
JSC «Kaz trans Oil»	2674,263	1427,682
LLP "Ural Poultry Factory"	17,56744573	17,36544573
LLP «Uniserv»	825,807	144,413
LLP «BKKS LPG »	65,321978112	8,011519
LLP «Zhaiykmunai»	9810,408462	6471,85
LLP «Perspective KAN»	43,6450549	10,785
JSC Zhaiykteploenergo	3172,8974860940	1139,395
JSC«Ak Kainar»	9,69703031	2,46597518
LLP«Elzhas»	227,82878	34,24509089
LLP«Aksaibusinessstroj»	157,663	29,66356
LLP«Hydromash-Orion»	86,583	20,273
LLP «Talap»	106,573	43,658

LLP «B,N,Gasoil Processing»	106,4692675	7,4459321
JSC «Uralskoilandgasgeology»	419,065	55,999
LLP «Bolashak-T»	165,5	55,346
KPO b.v.	19558,691	11165,254
JSC «West Kazakhstan cooperation of construction materials»	513,62298537	80,5021565
LLP «Techstroi WKR»	187,13704	41,356
JSC «Uralskdostroi»	187,014	40,556237
Branch «SaiparDrilling companyKarachaganak Project»	1216,770243	344,3148
LLP «Agrofirm Akas»	39,668249	6,139223665
IE «Zhaiyk-ET»	42,53298	7,14875
LLP «STN»	9,8748	0,203211

Reasons for reducing pollutant emissions

UMG "Uralsk" branch of JSC "Intergas Central Asia" - emissions of pollutants into the atmosphere from stationary sources are estimated for 2015 at 14490.0 tons. Compared to 2014, there is a reduction in emissions to 13%. The reason for reducing emissions is a smaller amount of bleed gas during repair work on the main gas pipelines.

JSC Condensate - reduction of emissions of certain pollutants decrease in the volume of processing of raw materials for 2015 compared with 2014 due to a.

Karachaganak Petroleum Operating BV (KPO bv) - reduction of the volume of pollutant emissions in the atmosphere by 20.4% compared to the same period of 2014 was due to a decrease in well operations, geological annealing and, correspondingly, a decrease Burning of hydrocarbon raw materials on flares;

LLP "Ural Poultry Factory" - a decrease in the actual volume of emissions of pollutants into the air by 37% is associated with a decrease in gas consumption during the heating season;

JSC ZKKSM - emissions decreased due to a decline in production and in connection with the shutdown of production.

Reasons for increased emissions

LLP Zhaikmunai - an increase in the volume of pollutant emissions by 16.6% is due to the commissioning of new facilities, increase of gas condensate wells. In connection with this, increase emissions sources (pollutant) into the atmosphere (boiler room, tail gas burner, compressor, generator sets, flare unit, liquefied hydrocarbon storage tank, gas condensate storage tanks, oil and chemical transfer pumps, drainage tanks, candles for purging the gas pipeline);

Western branch of JSC "KazTransOil" - an increase of emissions into the atmosphere from stationary sources in comparison with the same period of the last year is associated with a large volume of oil pumped through the main oil pipeline Uzen-Atyrau-Samara in the reporting period of the current year ;

LLP "Batys Su Arnasy" - an increase of pollutant emissions into the atmosphere by 15.4% compared with 2014 is due to a large consumption of gas during the heating season;

GCE "Aksayzhylukuat" - an increase of emissions into the atmosphere by 15.2% compared with 2014 due to large gas consumption during the heating season;

JSC "Zhaiykhylukuat" - an increase of emissions into the atmosphere by 27.0% compared to 2014 due to large gas consumption during the heating season;

Quality of atmospheric air

Observations of the state of atmospheric air in the West Kazakhstan region were carried out in the cities of **Uralsk** (2 fixed posts), **Aksai** (1 fixed post), in the towns of **Berezovka** (1 fixed post) and **Yarintsevo** (1 fixed post).

Water resources

Table 3 shows the operational data on wastewater discharge in WKR for 2015 compared to 2014.

Table 3. Information on actual discharges

Table 3. Information on actual discharges		2015	2014
Industrial discharges	water disposal thousand/m ³	2762,689	3446,869
	pollutants thousand.ton	14,562	12,4
Household waste water	water disposal thousand/m	8783,558	6567,066
	pollutants thousand.ton	3,625	2,3
Emergency and non-authorized discharges	water disposal thousand/m	-	-
	pollutants thousand.ton	-	-
Total (all of the above discharges)	water disposal thousand/m ³	11546,247	10013,935
	pollutants thousand.ton	18,187	14,7

The volume of sewage discharge increased (by 33.7%) in 2015, compared to the same period in 2014. The volume of wastewater discharge during the reporting period is more in comparison with the same period of the last year, which is connected with the washing of filters and water heaters of the hostel by the running water of SPN "Sakharniy" JSC "KazTransOil" West branch of the Ural oil pipeline administration.

The major users of wastewater discharges include Karachaganak Petroleum Operating BV (KBO BV), Batys Su arnasy LLP, Aksaizhylukuat GKP, Zhayikteploenergo JSC, Condensate, JSC "KazTransOil" Western branch of the Ural Oil Pipeline Administration, Zhaikmunai LLP.

There is an insignificant increase or decrease in the volume of wastewater discharge (Batys surnasy LLP, KPO bv JSC, GKP Aksaizhyluluat) at other enterprises.

The main volume of sewage is formed in the cities of Uralsk and Aksai.

The analysis of the pond storage is shown in Table 4.5.4.

Water outlets

Water discharge No.1, (conditionally clean water in the Ural River from the drinking water treatment plant of Batys Su Arnasi LLP).

2 events are planned for the amount of 23970.0 thousand KZT in 2015-2017 years.

1) Adjustment of the working draft "Construction of facilities for stopping discharge of pollutants after washing filters in the river. Ural" the planned amount of 8840 thousand tenge - budgetary funds is not allocated. 2) Development of design estimates for the project "Reconstruction of bioproducts 1,2,3,4,5" planned amount of 15130 thousand tenge - budget funds are not allocated.

The water discharge №2, (conditionally clean water in the Soldier old man of the Ural river from the cooling system of the turbogenerator No. 2 of the Ural HPP).

Within the framework of environmental measures, the development of a feasibility study of the project "Termination of the discharge of heat-exchange water from the CHPP into the Soldatsky old river" was completed. Ural "for the amount of 2,400.0 thousand tenge, according to the feasibility study for the project, 555 million tenge is needed.

Surface water quality

Observations of pollution of surface waters in the territory of the West Kazakhstan region were carried out at 9 water bodies: Zhayik, r. Shagan, r. Derkol, r. Elek, r. Shyngirlau, r. Saryozen, r. Karaozen, the Košim canal, the lake. Shalkar.

The water quality of water bodies in the territory of the West Kazakhstan region is estimated as follows: water "moderate pollution" p. Zhayik, r. Shagan, r. Derkol, r. Elek, r. Saryozen, the river Karaozen, the Koshim channel, Shalkar; "High level of pollution" the river Shyngirlau.

In comparison with 2014, the water quality of the river. Zhayik, r. Shagan, r. Derkol, Saryozen, Karaozen, Elek, Koshimsky Canal - has not changed significantly, in the Shyngirlau river it has deteriorated, in Lake Shalkar has improved.

The groundwater

The region belongs to the regions with a processing industry, which produces relatively few wastes that pollute the environment. The main polluters of groundwater are agricultural enterprises and utilities.

The sources of groundwater pollution are a group of oil and gas fields, filtration fields of gas compressor stations, oil heating stations, refineries, filtration fields of local industry enterprises: sewage water storage and filtration fields in the villages of Daryinsk, Novenky, Fedorovka, Burlin, Peretnoe, Ural airport ; Storage ponds and filtration fields of livestock farms in the villages of Rostoshi, Shchapovo, B.Chagan, Podstepnoe, Volodarskoe, Darya, Ozernoe, Sholpan, Balapan, Trekhino.

The main components polluting groundwater are: manganese, oil products, hydrocarbon gases, iron.

State of soil contamination

During the spring and autumn period, some soil samples taken by the RSE "Kazgidromet" in various districts of Uralsk were observed to exceed the norms for copper and cadmium.

Biodiversity

Ten objects of the nature reserve fund of state and regional significance operate on the territory of the West Kazakhstan region. Among them, three sites have the status of state reserves - Kirsanovsky, Budarinsky and Zhaltyrkul zoological reserves.

Kirsanov Zoological Reserve is organized with the purpose of conservation and reproduction of rare species of animals: elk, wild boar, roe deer, badger, fox, hare, river beaver. The area of the reserve is 61.0 thousand hectares; it is located in the Burlinsky, Terektinsky and

Zelenovsky districts of the region. In 2015, on the territory of the Kirsanov Zoological Reserve, the number of moose was 16 individuals, Siberian roe deer numbered 201 individuals, and a wild boar of 420 individuals.

The Budarinsky Zoological Reserve is organized with the aim of preserving and reproducing rare species of animals and birds: the European mink, the marten, the desman, the white-tailed eagle, the black grouse, the conservation of the wildlife habitat of the wildlife sanctuary, and the reproduction and use of other species of animals: wild boar, Foxes, corsac, elk, roe deer, badger. The area of the reserve is 80.0 thousand hectares; it is located on the territories of Akjaik and Zelenovsky districts. In 2015, in the territory of the Budarinsky Zoological Reserve, the number of elk species was 5 individuals, Siberian roe deer numbered 121 individuals, a wild boar of 92 individuals, hares of 440 individuals, foxes of 60 individuals, muskrat of 85 individuals, ferrets of 120 individuals, wolves of 190 individuals, badgers of 58 individuals, Beavers 62 individuals.

Zhaltyrkul Zoological Reserve is organized with the purpose of conservation and reproduction of rare species of birds listed in the Red Book of the Republic of Kazakhstan: curly pelican, crane belladonna, karavayka, black-headed gull and others. And also the reproduction and use of other species of animals: wild boar, hare, fox, badger, goose gray, ducks. The area of the reserve is 19.0 thousand hectares; it is located on the territory of Zhangala district.

In order to preserve the habitat, improve the conditions for the reproduction and protection of rare and endangered plant and animal species, 7 objects of specially protected natural areas of local importance have been created on the territory of the West Kazakhstan Oblast.

The Botanical Nature Monument "Dubrava" is located on the left bank of the Ural River to the north of the village Dzhambul of Terekti on the area of 6 hectares.

Botanical reserve "Selectciyonnyi" occupies 36.3 hectares in the floodplain bend of the river Derkul, 1.5 kilometers from the village Mashtakovo.

AkKum wildlife reserve is located on the territory of Chingirlau and Karatobe districts on an area of 9042 hectares.

Botanico-zoological nature monument "Mirgorodsky" has an area of 3950 hectares in the Burli district.

The Urdinsk geobotanical reserve was established to preserve unique pine and poplar plantings of Naryn sands, rare plant and animal species, as well as reference areas of the natural complex on an area of 16,405 hectares.

The nature monument "Big Ichka" is located in the Taskala district; it was created with the purpose of preserving the natural landscape, the area of which is 175 hectares.

The nature monument "Sadovskoe" is designed to preserve a unique natural complex, located on the northern outskirts of the regional center. Lake area of 150 hectares is a horseshoe-shaped old man of the Chagan River, performs recreational, water security, hydrological and water protection functions.

The area of the forest fund of the region is 215306 hectares, including 102896 hectares covered with forest; the percentage of the forest area of the oblast is 0.6%.

Forest plantations are mainly located in the floodplains of the Ural and Ilek rivers, by small pins on the beams and slopes of the Chingirlau district, in the interbarchanic depressions of the Bokeyorda district, and also by protective plantations of railways and highways, along the banks of canals and reservoirs, and in the sands. Forest plantations of the region have an

important water protection, soil and field protection.

The main environmental threats to vegetation are the degradation of plant associations of steppe, semidesert, desert zones and the reduction of wooded areas, due to economic activities of nature users

Bosom

There are 54 subsoil users on the territory of the region, of which: 36 are engaged in the development of quarries for common minerals, 3 extracts solid minerals, 11 are exploring and extracting hydrocarbon raw materials (of which 2 are engaged in mining and extraction), 5 Subsoil users, including:

Industrial oil and gas production is conducted: KPO b.v. At the Karachaganak oil and gas condensate field and Zhaikmunai LLP at the Chinarevskoye oil and gas condensate field;

KBO b.v. It re-injects sulfur dioxide into the reservoir, this allows rational use of subsoil resources by maintaining reservoir pressure and, thereby, a high recovery of liquid hydrocarbons, as well as preventing the burning of high-sulfur gas. The volume of gas injected into the bowels in 2015 is 8452.589 million m³.

Radiation situation

To date, the radiation situation in the territory of the West Kazakhstan region is characterized as stable, the gamma background in the regions of the region was 0.01-0.19 mk / h. 9 enterprises of the region use 53 sources with ionizing radiation with a total activity of 13786.67 GBq. In 2015, 5 radioisotope sources with a total activity of 550 Curies were put into long-term storage.

GU "West Kazakhstan Regional Oncology Center" uses devices that use radioactive materials in its work. In 2015, medical institutions of radioactive waste were not buried. During the production activity of the enterprise on the territory of the WKO, radioactive waste was not formed and is not available.

In the field of radioactive contamination and ownerless sources of ionizing radiation are not available, there are no uranium deposits.

On the territory of the Karachaganak oil and gas condensate field (KOGCM) there are Lira objects, which are six underground cavities of about 50.0 thousand m³ each, created in 1983-1984, in rock salt deposits at depths of 796-931 m. Using underground nuclear explosions with a total capacity of 60 kilotons.

The radiation monitoring of Lira's facilities on the territory and adjacent settlements is carried out by the Aksai branch of the Institute of Nuclear Physics (INP) within the framework of the project "Comprehensive research and monitoring of Lira's facilities."

According to the results of radiation monitoring, in 2015, no excess radiation background and radiation anomalies were detected in the study area. The study of drinking water from wells in populated areas also revealed no radiation contamination, which was below the detection limit of the method used.

Observations of the level of gamma radiation in the terrain were carried out daily at 2 meteorological stations (Uralsk, Taipak) and at 3 automatic observation posts for atmospheric air pollution in Uralsk (No. 2,3) and Aksai (№ 4).

The average values of the radiation gamma background of the atmospheric surface layer over the populated areas of the region were in the range 0.04-0.69 μ Sv / h. On average, the radiation gamma background in the region was 0.11 μ Sv / h and was within acceptable limits.

Control over radioactive contamination of the surface layer of the atmosphere in the territory of the West Kazakhstan region was carried out at 2 meteorological stations (Uralsk, Taipak) by sampling air with horizontal plates.

The average daily density of radioactive fallout in the surface layer of the atmosphere in the region fluctuated between 0.7 and 2.7 Bq / m². The average density of deposition over the region was 1.2 Bq / m², which does not exceed the maximum permissible level.

Waste

The total amount of accumulated waste is more than 3.7 million tons. About 4% municipal waste of these is recycled. There are no sample solid waste landfills in rural settlements of the region.

In general, there was a significant decrease in the amount of industrial wastes in 2015 (70.4 thousand tons), compared to the previous year in 2014 (106.12 tons). In the region, the decrease was 35.72 thousand tonnes. (106.12 - 70.4).

This happened due to a significant reduction in the amount of generated drilling waste, for large companies, such as: KPO b.v. Zhaikmunai LLP, Karpovsky Severny LLP.

The largest amount of industrial waste was generated in the oil and gas production sector - 48.2 thousand tons. (Last year it was 74.01 tons). This amount of waste accounts for 65.1% of the total mass of industrial wastes generated in the region as a whole (70.4 thousand tons).

According to the operative information, the other branches of the regional economy also experienced a significant change in the volume of generated waste, in the region as a whole, by -25%.

Recycling of industrial wastes in 2011 amounted to 11.8% (in 2014 - 9.1%), processed, disposed of - 48.8% (32.9%), placed on landfill sites - 11.6% (11.7%), transferred Other enterprises (for use, processing, utilization and disposal) - 27.8% (46.3%).

The main enterprise of the region where 72.78% of the processing and utilization of industrial drilling wastes takes place is KPO bv.

The company has a drilling fluid plant (ZBR), which processes and prepares drilling muds previously used in the drilling process for reuse. According to the drilling fluids plant, up to 90% of the used waste solution is reused.

There is a rotary kiln for treating solid oily waste.

The technology of thermal neutralization is used, which allows to reduce the initial volume of waste by 90-95% (communal, medical, industrial (oil sludge)). The amount of ash is 5-10% of the amount of incinerated waste.

The inventory of PCB-containing equipment (1st stage) was carried out in the region at the largest enterprises, in accordance with the order of the Minister of Environmental Protection No. 40-p "On Approval of the Rules for the Management of Persistent Organic Pollutants and Wastes containing them".

In total, there are 423 cattle cemetery in the region, and according to the number of available settlements. Of these, typical, executed in accordance with the project documentation 231 pcs., The remaining 192 are adapted.

Out of the total number of cattle cemeteries, 6 do not comply with sanitary standards, the rest are in satisfactory working condition.

The condition of the cattle cemeteries is checked in the spring, during the period of the regional sanitary and ecological month, there have been no serious violations for a number of

years. During the period of the sanitary and ecological month of 2015, work was carried out to equip 95 cattle cemeteries on the territory of the region.

Elimination of spontaneous landfills in the settlements of the region and Uralsk

Orphaned waste in the area:

2013 - 17,5 thousand tons

2014 - 16.9 thousand tons

Polygons of toxic waste

"Polygon of toxic wastes of 1, 2, 3 classes of danger in Uralsk" was commissioned in December 2007. The capacity of the landfill is 2500 tons of waste per year, the area is 18 hectares. Project life is 20 years. The work schedule is seasonal, the landfill can take waste only in the warm season. The method of storage - in separate maps, in bulk.

The polygon is accepted in the communal property of the West Kazakhstan region, fixed on the balance of the State Institution "Department of Housing and Communal Services, Passenger Transport and Highways of the City of Uralsk".

At present, the local executive body decided to operate the landfill as a site for processing industrial waste. For this purpose, the purpose of the land plot has been changed, and it was transferred to Batys Ortalygi LLP, which in this area intends to install equipment for waste processing.

There is a "Polygon for disinfected pesticides and packaging from under them" in the territory of the Taskala district of the WKR (Mereisky a / o), in the preserved state since 1990, The polygon belonged to JSC "Selskhozkhimiya" earlier, there is no information about the volumes and types of buried waste.

Solid municipal waste polygons

There are two polygons for the placement of solid household waste in the region: Uralsk and Aksay. The first was put into operation in 1975, the second in 1986.

In 2015, the operating polygon of Uralsk was implemented by Eco-Plus LLP. The operation of the Aksay SDW polygon is carried out by the State Communal Enterprise "Gorkomkhoz" of Akimat of Aksay.

Both enterprises have a base and technical means for carrying out work on removal from the territory of the settlement and disposal of waste, but in both cases the technology of disposal of solid waste is not observed, in particular, there are no own quarry care necessary for layer-by-layer replanting of solid waste. Cases of ignition of solid waste are allowed, sorting and selection of valuable components is completely absent, liquidation funds of polygons are not created.

The total area occupied by these solid waste disposal facilities is more than 550 hectares. The volume of accumulated household waste in the region is 6114.02 thousand tons as a whole, 01.01.2016.

Sorting of waste and separate collection of waste in the region is also not applied.

The construction of a waste sorting plant was conducted in Uralsk LLP "Arcturus". The construction project - "Solid waste sorting complex with a total capacity of 100 000 tons per year in the city of Uralsk" passed all kinds of examinations in the established manner, but due to lack of funds construction was frozen, about 200 million tenge was disposed.

Waste recycling

Currently there are about 300 facilities for the reception of various types of waste in the

region. A number of regional enterprises are implementing and using resource-saving and environmentally friendly technologies, carrying out measures aimed at reducing waste generation.

Usenov IE accepts recycled paper for processing, started producing toilet paper in 2013, they accepted 150 tons of waste paper for processing in 2015.

IE VTS Uralsk (Uralsk, and IE Kuksova (Altyn Alma market), Karavan (IE Borisov), IE Glukhova organized collection of waste paper (packing paper and cardboard, Polymers) in their own territories. They collected and exported for processing outside the region - 1660 tons of secondary materials in 2015.

KBO b.v. organized and conducts separate collection of waste paper in the office premises of the enterprise, for 2015 more than 40 tons of recyclables were collected, transferred for processing.

LLP "Antey" continues to receive polymers for the production of its own products, hatches for water supply and sewage systems, roofing tiles, tiles, etc. are made on the basis of a polymer-sand composition. In 2015, 14 tons of polymer wastes were recycled and processed;

The volume of secondary materials collected by entrepreneurs (waste paper, polymer packaging) amounted to 1.72 thousand tons per year in 2015, which corresponds to 1.7% of the mass of the solid waste generated. This recyclable material is mainly exported from Kazakhstan to the Russian Federation.

LLP "Ural Poultry Factory" and LLP "AKAS" collect and sell to peasant farms and the population in the form of fertilizer of rotted bird droppings; this is no less than 4.5 thousand tons per year.

Mercury-containing lamps are transferred to JSC "Talap" for further demercurization and neutralization of mercury and fluorescent lamps.

Demercurized mercury-containing lamps and devices by area:

2012 is 32.0 thousand units.

2013 - 18.8 thousand.

2014 - 25,5 thousand pieces.

2015 - 18,5 thousand pieces.

Neutralization by the method of incineration of medical waste is carried out in the cities of Uralsk and Aksai. This work is carried out by JSC Talap, GCE Regional Hospital and Burli district hospital.

Means of Chemicalization

Funds have been allocated from the local budget for burial and disposal of containers from chemical means in the amount of 4248 pieces. LLP "Foras Group" from the city of Shchuchinsk provides collection and disposal of tare from the means of chemicals.

Packages for pesticides were removed:

2012 - 7,8 thousand pieces.

2013 - 6,3 thousand pieces.

2014 - 7,5 thousand pieces.

2015 - 4,24 thousand pieces.

Renewable energy sources

Currently 79 peasant households use 103 sources of renewable energy for their own

needs, including 91 solar batteries, 12 wind farms in the West Kazakhstan region.

Register of environmental problems

The West Kazakhstan region has many environmental problems. The Department of Ecology in the West Kazakhstan region developed the Register of Environmental Problems of the West Kazakhstan Region:

1. Wear of sewage treatment plants in Uralsk and the city of Aksai;
2. Construction of a system for biological cleaning of urban sewage treatment plants;
3. Reconstruction of the system for mechanical cleaning of urban treatment facilities;
4. Reconstruction of the facilities of the discharge route of clean-clean water from storage tank No. 2;
5. Timber and sewage disposal in the city of Uralsk;
6. Reconstruction of the drainage station, construction of a gravity sewer collector, reconstruction of bioproducts;
7. Conservation of the p. Ural, r. Derkul, r. Chagan. Restoration and reconstruction of water supply facilities in the southern regions of the region;
8. Construction of facilities to stop the discharge of pollutants after washing the filters in the river. The Urals;
9. Reconstruction of the water-supply tract of inter-basin water transfer from the Ural-Kushum system to the Big Uzen river;
10. Reconstruction and restoration of the Aydarkhan reservoir on the Big Uzen river;
11. Reconstruction of the Kirov-Chizhin Canal for interbasin transfer from the Ural-Kushum system to the river. B.Uzen near the village of Akpater of the Kaztalov district;
12. Increase of water content and improvement of the hydrological regime of the river. Urals within the Western Kazakhstan region;
13. Bank protection works near the village of Oblivka, Burli district, West Kazakhstan region;
14. Overhaul of the body of the dam and bottom gates of the reservoir on the river. Barbastau Uzunkol rural district of the Terektinsky district WKO;
15. Deepening the bank of the Kushum River in the territory of the state hunting farm Kirovsky ZKO;
16. Reconstruction of the Ulentinskaya Liman Irrigation System of Syrymsky District;
17. Reconstruction of the Kaldigaity system of liman irrigation of the Karatobe district;
18. Water supply for fishery and ecological purposes, in the Ural-Kushum, Zhanybek irrigation systems and the Big and Small Uzen rivers;
19. Collection, processing and utilization of production and consumption wastes, prevention of pollution of land resources;
20. The lack of sample solid waste landfills in rural settlements;
21. The threat of pollution of the territory of the Ural groundwater field by an organized garbage dump in the village of Daryinsk;
22. The threat of pollution of groundwater and soil cover contaminated with oil products in the village of Toganas, liquidation of soil pollution by oil products in the village of Toganas, Syrym district;

23. Construction of a complex for sorting and processing of production and consumption waste in the Uralsk SDW landfill area;
24. Construction of a new polygon in the city of Uralsk;
25. Construction of a landfill site village Daryinsk Zelenov district of the WKR;
26. Construction of a solid waste landfill in Aksay, Burlinsky district, WKR;
27. Environmental problems of underground reservoirs created as a result of nuclear explosions. Environmental problems are arising from the impact of military ranges "Kapustin Yar" and "Azgir".

Other environmental problems of the West Kazakhstan region:

- 1) the influence of military training grounds on the environment and health of the population of the southern regions of the region;
- 2) the impact of the oil and gas condensate field on the environment and the health of the population of nearby settlements;
- 3) growth in the volume of non-processed solid waste and contamination of soils, air and water with these wastes;
- 4) reduction of biodiversity and degradation of steppe, semi-desert and desert ecosystems of the West Kazakhstan region, protection of saigas, and rare and endangered ungulate species;
- 5) protection and reproduction of fish resources;
- 6) reproduction of forests and afforestation in the floodplain of the Ural River, forest and steppe fires;
- 7) pollution of Shalkar Lake and its shallowing;
- 8) technogenic pollution of lands in the areas of mining of the region;
- 9) high energy intensity of the economy;
- 10) ecologically conditioned morbidity.

2.3 Analysis of environmental situation in Kostanay region

The region is located in the northern part of the Republic, administrative center is the city of Kostanay. The average population density in the region (per 1 km² of territory) is 4.5 people.

There are 16 rural areas and 5 cities, 3 urban settlements, 5 rural settlements, 250 rural and aul districts in the region.

The territory of the region is characterized by relatively flat terrain. Its northern part is occupied by the southeastern margin of the West Siberian lowland, Torgay Plateau lies to the south of it; wavy plain of the Trans-Ural plateau is in the west of the region, and in the south-east - the spurs of Saryarka. The territory of the region from north to south is crossed by the Torgay trough. In the central part of the Torgay Plateau, from the west to the east lies Sipsynagash trough. In the west of the region there is the mountain of Zhetikara, on the Torgai plateau - the mountains of Kargaly, Zhylandy, Kyzbel and Teke, at the eastern foot of Kyzbel-Kyzemshekshoki mountain, in the southeast - the hill of Zhylanshykturme and the mountain of Kayyndyoshok. There are rich deposits of iron, zinc and gold-bearing ores, bauxites, brown coal, asbestos, refractory and brick clays, flux and cement limestone, glass sand, building stone and others.

The climate is hush continental. Reservoirs were built on the Tobol River, Upper Tobol (87.4 km², 47 km) and Karatomor (94 km², 38 km). The center of the region is located in the city of Kostanay.

The most attractive industry for investment is the mining industry and quarrying (33.5% of the total investment in fixed assets).

Atmospheric air

Pollution of the air basin of the region is caused by emissions of pollutants from enterprises - polluters of mining, heat power industry, motor transport.

Total emissions' amount to 316.1 thousand tons, of which industrial emissions amount to about 17%, share of emissions from the combustion of motor fuel is about 83% (224.45 thousand tons).

Works on the project "Reconstruction of the traffic regulation network" are continuing in the regional center (Kostanay), the ecological effect is the optimal traffic on the main highway of the city through the regulation of digital traffic lights on the principle of "green wave", which reduces the emission of pollutants from vehicles.

Mining industry of the region is represented by large enterprises for the extraction of iron ore and the production of iron ore pellets - JSC "SSODC" in Rudny and "Orken" LLP (Lisakovskiy ODC (iron ore refinery)). Non-ferrous metallurgy enterprises include the Krasny Oktyabr and Torgai bauxite mining companies of Aluminum of Kazakhstan JSC, Shaimerden LLP of Kamysti region (zinc, nickel), LLP Orion Minerals of Zhitikara and Varvarinskoe of Taran region (gold, copper) and others.

The information on the volumes of atmospheric air pollution has been prepared according to data provided by enterprises - nature users:

The volume of total emissions from stationary sources amounted to 91.6 thousand tons, including 11.754 thousand tons of sulfur dioxide emissions, 2.027 tons of nitrogen dioxide emissions, 22.912 thousand tons of particulate emissions, 4 carbon monoxide emissions , 82 thousand tons (Table 4).

Table 4. Emissions to the atmosphere from large industrial enterprises

Enterprises	Authorized volume, tons / year		Actual volume tons / year		Excess tons / year
	2015	2014	2015	2014	
"Varvarinskoe" JSC	2314,6489	2998,459	2148	2181	-
"KFEC" SCE	12125,72	12125,7	1978	1982	-
Arkalyk Fuel and Energy Complex SCC	1073,4	1073,4	393	393	-
"Kostanai Minerals" JSC	7467,312	8584,663	1500	1496	3,96
Rudny Watercanal LLP	17,95851	0,9335	0,9340035	0,93349	-
"RazrezPriozerny" LLP KRC	219,567	227,088	0,0095	16,1527	-
Shaimerden JSC	38,9804	226,6108	26,4	21	-
"Zhitikarakomunenergo" SCE	430,2848	430,2848	313,4	345,35	-
SCE "Kostanay Su"	33,4224	51,305592	27,3121	22,088	-
Orion Minerals LLP	742,918	931	368	368	0,361
"Tazalyk 2012" LLP	3681,356	1799	1765	227	-
Orken LA LLP	3066,1246	3374,342	696	1088	-

AJSC KOBO	5469,5	2890,9	1374	1331	-
AJSC TOBO	801,169	789,113	709	512	-
SSODC JSC	105 391,98	104659	32704	51801	0,086
SCE BREJ "Lisakov gorkommunenergo"	242,1435	242,1435	167	168	-
Troitsk HES	-	-	-	-	-
TOTAL	143 116,4851	140 403,943	44170,055	61952,524	4,407

The share of the largest mining enterprise of the Kostanay region JSC SSGPO accounts for about 74% of emissions from the total volume of industrial emissions of the region's enterprises.

In connection with the increase in production volumes, the limit requested by the users of natural resources is increased in comparison with the previous year: Tazalyk LLP has increased 7 times since 2012, FAO TBRU - 138%, Shaimerden - 125%, Kostanay Su - 123%.

At the same time, there are enterprises in the region that reduce production volumes and, as a consequence, request less for a year the volume of emissions to the environment, compared to the previous one: LLP KRK "RazrezPriozerny" - 99.9%, JSC "SSGPO" - 58.3 %, LF TOO Orken "- 36%.

A favorable condition of atmospheric air in the region is facilitated by the fact that all of the largest boiler houses in the Kostanay region use natural gas as fuel. The exception is the TPP of JSC SSGPO, which uses coal, and Arkalyk TPP, which uses fuel oil.

The quality of atmospheric air in the cities of Kostanay, Rudnyi, Arkalyk, Zhitikara, Lisakovsk and Karabalyk settlements was assessed as **low** level of pollution.

Water resources

Surface reservoirs of the Kostanay region are referred to Tgol - Turgai water basin. The length of the Tobol and Torgai rivers is more than 500 km, rivers over 100 km long have 21 rivers, more than 10 km of waterways, about 310, more than half of them represent temporary watercourses.

Within the region there are about 5000 lakes, the total area of which is 2% of the total area of the region, about 20% of the lakes are located in the northern part of the region; 60% - in the southern. Eight percent of the lakes have a mirror area of less than 1 km². The largest are the Kushmurun, Sarykopa, Aksuat and Sarymoin lakes.

Tobol River belongs to large watercourses and is cross-border, flows through the territory of two states - the Republic of Kazakhstan and the Russian Federation. The part of the basin located in Kostanay, Chelyabinsk and Kurgan regions is considered to be a Russian-Kazakhstan transboundary territory of the Tobol basin. Large tributaries of the Tobol River: Sinta-Zhelkuar, Ayat, Uy, Ubagan, Toguzak. The total catchment area of these rivers in the territory of the Kostanay region is 167,520 km².

As a result of economic activities, the Tobol River and its tributaries are regulated by numerous ponds and reservoirs.

In Kostanay oblast, 10 reservoirs are operated to meet the economic and drinking needs of cities, peasant farms, garden societies and industrial uses. The projected volume of reservoirs along the Tobol River is 1461.68 million m³.

The volume of water in the large reservoirs of the region increased insignificantly, the filling capacity of which in the last years of dry years was 60-70% of the design values:

Upper Tobol Reservoir: projected volume is 816.6 million m³, the actual volume is 552.87 million m³, the volume of the last year is 593.37 million m³ - a volume decrease of 40.5 million m³ by (7%) .

Karatomar Reservoir - project volume - 586.0 million m³, actual volume - 415.2 million m³, the volume of the last year - 409.46 million m³, an increase of 5.74 million m³ (1%).

The total volume of waste water discharge in the region for the year 2015 was 74,621.737 thousand m³, which is 1% lower than for the reporting period last year (for 2014 it was 74,716,898 thousand m³) (table 5.).

In Kostanay oblast, four sanctioned discharges to surface water bodies are made from enterprises:

- Branch of JSC "Aluminum of Kazakhstan" KOBO, discharge of quarry water into the system of lakes Karamsa - Kenderli. Discharge of mine wastewater is carried out after preliminary treatment at local treatment facilities in the form of sedimentation tanks;

- SCE "Kostanai-Su", dumping of wash water from the filtration station of water treatment in the Tobol River without treatment;

- LLP KRC "Razrez Priozerny", discharge of quarry water in the lake. Kushmurun without cleaning;

- SCE "Upper Tobol fish hatchery", discharge into the Tobol river without treatment.

The dynamics of actual discharges of polluting substances into the environment was: for 2015 - 113.744 thousand tons, which is 43% lower than for the reporting period last year (for 2014 it is - 198.471 thousand tons).

The total reduction of pollutant discharges into the environment is 1 269.234769 thousand tons.

The highest reduction in pollutant discharges is observed in JSC SSGPO - 1 269.228169 thousand tons. This decrease in discharges of pollutants was achieved through the implementation of environmental measures:

- interception of drainage water from the tailing dump to exclude their entry into the river. Tobol (Rudny and Kachar industrial sites). Reduction of groundwater pollution by 5,363,409 thousand tons;

- interception of drainage water to exclude their entry into the river. Tobol Sarbaisky drive (Rudny and Kachar industrial sites). Reduction of groundwater pollution by 3.7816272 thousand tons.

Also, the reduction in wastewater discharge was achieved by increasing the circulating water consumption and reducing the inflow of groundwater into the water intake of the quarry by the following enterprises:

In Orion Minerals LLP, the volume of wastewater discharges is less by 3% than in the same period of the previous year (in 2015 the discharge volume is 547,406 thousand m³, for the year 2014 the discharge volume is 564,544 thousand m³).

In JSC Kostanai minerals, the volume of wastewater discharges is less by 42.8% than in the same period of the last year (in 2015 the discharge volume is 413,049 thousand m³, for 2014 the discharge volume is 722,629 thousand m³).

For the purpose of rational water use and reduction of discharges, mining enterprises (JSC SSODC, Branches of Aluminum of Kazakhstan JSC KOBO, TOBO, LLP Orion Minerals, JSC Kostanai Minerals) use quarry water for irrigation and dust suppression at work sites And dumps.

It should also be noted that the volume of discharges from utilities (SCE Kostanai-Su, LLP Rudny Water canal, SC Arkalyk FEC) has been reduced due to a decrease in water consumption by enterprises and the public due to savings in the installed meters.

The largest amount of water saved is observed at JSC SSODC - 7,077 thousand m³. The most effective measures to save river water are:

- re-use of process water for transportation of refuse burnouts of the thermal power station instead of river 6 227,965 thousand m³.

- use of technical waters of circulating water supply for dust suppression when drilling wells and in aspiration installations 0,629968 thousand m³.

Also, a large amount of saved water resources is observed at JSC "Varvarinskoe" (reuse of recycled water from the tailing dump) - 4380 thousand m³.

The total ready economy of river water and water resources for 16 large enterprises is 11,682.361 thousand m³.

Table 5. Information on actual discharges

Title		2015	2014
Industrial discharges (including discharges into surface water bodies)	The volume of water disposal, thousand cubic meters	46947	47035
	Volume of pollutants, thousand tons	90,544	164,312
Household waste water	The volume of water disposal, thousand cubic meters	18988	28166
	Volume of pollutants, thousand tons	11,985	16,054
Emergency and non- authorized discharges	The volume of water disposal, thousand cubic meters	0,00	0,00
	Volume of pollutants, thousand tons	0,00	0,00
Discharges into surface water bodies	The volume of water disposal, thousand cubic meters	8687	12059
	Volume of pollutants, thousand tons	11,215	15,337

The increase in the volume of wastewater occurred at the following enterprises:

The branch of JSC Aluminum of Kazakhstan due to the increase of water inflows of underground waters during the development (deepening) of quarries, the volume of discharge of sewage was: 2015 - 19357.9 thousand m³; In 2014 - 14992.1 thousand m³, which is 29% more.

JSC "Varvarinskoe" due to posting boards, quarrying North-East-1, South, North-West, the volume of discharge of sewage amounted to: 2015 - 2269.22 thousand m³; In 2014 - 2135.24 thousand m³, which is 6% more.

In connection with the increase in wastewater discharges, Varvarinskoye JSC has led to an increase in the discharge of pollutants. The volume of discharges of polluting substances into the environment was: 2015 - 5,2164 thousand tons; In 2014 - 4,73032 thousand tons, which is 10% more.

Treatment facilities

Sewage treatment plants are available in all cities (Rudny, Lisakovsk, Zhitikara, Kachar), except for the regional center of Kostanay. In 2015, work was carried out on the reconstruction and construction of sewerage networks and sewage water storage in the village of Denisov for a total of KZT 408.7 million.

The main problem is the lack of a biological wastewater treatment plant in Kostanay, included in the Register of Environmental Problems of the Republic.

Surface water quality

Observations of surface water pollution in the territory of the Kostanay region RSE "Kazgidromet" were carried out at 8 water bodies: Tobol, Ayet, Togyzak, Uy, Obagan, Upper Tobol, Amankeldy and Karatomar reservoirs.

The water quality of water bodies in the territory of the Kostanay region is estimated as follows: "highly polluted" water - river Tobol, Ayet, Togyzak, Uy, Obagan, Karatomar; "moderate level of pollution" - Amankeldy, Upper Tobol.

In comparison with 2014, water quality in Togyzak, Uy rivers, Amankeldy, Karatomar, Upper Tobol - did not change significantly, in the rivers Tobol, Ayet, Obagan - worsened.

In the territory of Kostanay oblast, high pollution was recorded in the following water bodies: the Tobol River - 13 cases of WP, the Ayet River - 4 cases of WP, the Togyzak River - 4 cases of WP, the Amankeldy Reservoir - 2 cases of WP, the Uy River - 4 cases of WP, the Obagan River - 2 cases of WP, Karatomar - 1 case of WP.

The causes of high levels of heavy metals in the surface waters of the Tobol, Obagan, and Karatomar reservoirs are natural and climatic factors: the rivers feed in the wintertime in the near-river zone mainly due to groundwaters containing high concentrations of manganese due to its coming from the brown-lime-rich ores, which increases the content of heavy metals in river water.

The groundwater

The main technogenic impact on the geological environment is provided by cities (Kostanay, Rudny, Zhitikara, Lisakovsk), settlements, industrial enterprises (power plants, mining enterprises for the extraction and enrichment of iron and aluminum ores, machine building and metalworking plants, petrochemical and woodworking plants, various enterprises of light and food industries).

The largest Sokolovsko-Sarbaisky ore-dressing combine, Kacharskiy IOR, Kurzunkulsk and Zhitikara mines have been created in the region, the Lisakovsk brown iron ore deposit is under development, bauxite mining, development of brown coals.

There are more than 70 registered potential sources of groundwater pollution in the region. These are dumps, tailings dumps of mining enterprises, accumulators and fields of filtration of cities, large industrial regions, factories, oil depots, poultry farms, livestock complexes, garbage dumps, etc.

When operating life support systems of cities and settlements, facilities and operation of various industrial enterprises, agricultural objects, there is a violation of the natural situation. Many components of the geological environment, including groundwater, are polluted with wastewater and wastes of various anthropogenic activities.

The main components polluting groundwater are nitrite, manganese, oil products.

Pollution of land resources

According to the information of the State Administration "Control over the use and protection of lands of the Akimat of Kostanay oblast", over the period of 2015, 100,722 thousand hectares of land were identified, degraded due to irrational use of agricultural land in terms of securing land from Degradation.

The state of the land resources of the Kostanay region is dominated by enterprises of the mining industry, agriculture, and power engineering.

Technogenically disturbed and polluted lands are widespread in industrial zones of cities, places of mining and processing of minerals. In open-pit mining in large areas, land is alienated for non-agricultural purposes: quarries, dumps, tailings, storage of mines and domestic water.

To date, 9 large enterprises operate in the territory of the region, which affects most of the land infringement, namely: JSC Aluminum of Kazakhstan - KOBO, JSC Aluminum of Kazakhstan - TOBO, branch of OJSC "OGK-2" – Troitsk HES, JSC "Kostanai minerals", JSC "Varvarinskoe", JSC "SSODC", LLP "Orion Minerals", JSC "Shaimerden", LLP "Orken" - Lisakovsk branch.

Enterprises at the completion of mining operations are carrying out works on the reclamation of waste land.

According to statistical reports as of January 1, 2016, over 4700 hectares are considered to be reclaimed in the region.

The main amount of waste disturbed lands in the region includes: JSC Aluminum of Kazakhstan - TOBO-1013 ha, JSC Aluminum of Kazakhstan - KOBO - 2928 ha, branch of PJSC "OGK-2" – Troitsk HES - 660.8 ha, Kostanai Minerals JSC 79 hectares, Orion Minerals LLP - 55 hectares, JSC SSODC - there are no worked up disturbed lands, Lisakovsk branch of Orken LLP - there are no worked out disturbed lands, Varvarinskoe LLP - there is no waste land.

In 2015, the region's enterprises recultivated the damaged lands on an area of 730 hectares, including 404 hectares of Aluminum of Kazakhstan, 297.7 hectares of Troitsk HES of OJSC OGK-2, 22 hectares of Orion Minerals, LLP "Kostanai minerals" - 3 hectares.

For comparison, for the period from 2012 to 2015 the enterprises of the region carried out works on reclamation of disturbed lands and returned to agricultural production: in 2012 - 108 hectares, in 2013 - 250 ha, in 2014 - 965.9 ha, in 2015 - 730 ha.

At Troitsk HES, work has been completed on the placement of ash and slag wastes at the 1st and 2nd sections of the ash dump of Lake Baikal. Shubarkul in the territory of the Karabalyk region. Troitsk HES enterprise developed and approved a working project "Elimination of the ash dump located on Shubarkul Lake", the period for complete land reclamation is set until December 31, 2018.

Department of Ecology is monitoring the quantity and quality of remediation works. The dynamics of the work: in 2010, 90.85 hectares, in 2011-64 hectares, in 2012-157.6 hectares, in 2013-250 hectares, in 2014-426.1 hectares, in 2015 297, 7 hectares. Reclamation work on the spent 1st section of the ash dump is completed - an area of 556 hectares, technical re-cultivation of the 2nd section is underway. Sowing of perennial grasses is made.

At the enterprise LLP "Orion Minerals" of the Zhitikara region 55 hectares of worn out disturbed lands were listed. The enterprise carried out works on reclamation of lands on the area: in 2014, 11.3 hectares, in 2015-22 hectares.

Pollution of soils with heavy metals in Kostanay, Arkalyk, Lisakovsk, Rudny, Varvarinka, Zhitikara village can be obtained on the site of the RSE "Kazhydromet" (http://www.kazhydromet.kz/ru/monitor_beluten_archiv2015).

Bosom

As of December 31, 2015, 75 subsoil users with 89 contracts for subsoil use were registered in Kostanay oblast, including:

- 43 contracts for common mineral resources (CMR)
- 39 contracts for solid minerals (SM);
- 6 contracts for groundwater;

- 1 contract for the construction and operation of underground facilities not related to exploration and production (LLP "Sharua" on the landfill of toxic waste).

Biodiversity

The total area of the State Forest Fund of the region is 681.15 thousand hectares, including a forest area of 234.9 thousand hectares.

There are 11 state institutions for the protection of forests and fauna, and there are 15 specially protected natural areas (PAs), in the territory of Kostanay oblast, including:

- 1 state natural reserve (Naurzum), the area of which is 191381 hectares;
- 1 state natural reserve "Altyn Dala", the total area of 489766 hectares;
- 3 state natural (zoological) wildlife sanctuaries of the republican significance (Mikhailov, Zharsor-Urkash and Taunsor), with a total area of 141100 hectares;
- 10 nature monuments of local significance, with an area of 35.5 hectares.

As of January 1, 2016, 45 forest fires were registered on the territory of the state forest fund with an area of 1607.8 hectares, including 1020 hectares covered with forests.

For the year of 2015, forest protection agencies conducted the following preventive measures to combat forest fires: 884 km of mineralized fire bands along the borders of planted forests, maintenance of mineralized strips was carried out in the amount of 4,373 km, 690 sold out for fire prevention, 752 regulations for prohibition were issued to agricultural users Agricultural flocks on the lands of the forest fund and adjacent territories, 185 lectures and conversations were held by organizations and institutions, 37 articles were published in the media.

On the sites of the state forest fund, forest plantations of the main forest-forming species (pine and birch) were planted. Planting of forest cultures in Kostanay region was carried out on an area of 1332 hectares. In addition, forest institutions completed the addition of forest cultures of past years on a total area of 579 hectares. Purification of burning was carried out on an area of 169 hectares.

The total number of seedlings provided by forestry institutions for the gardening of settlements of the region amounted to more than 90 thousand pieces.

Forest management institutions carried out planned forest protection measures: forest pathological examination of forest stands, protection of anthills, hanging out of starling-houses. At the end of the year, the area of foci of pests and forest diseases was 3006 hectares.

Department of Ecology in Kostanay region in connection with the investigation of the case of saigas in the territory of Amangeldy and Zhangeldy districts of Kostanay region in the period carried out studies of soil, water from surface water bodies and atmospheric air. The facts of pollution are not revealed. Dosimetric monitoring of environmental objects was carried out. Exceeds over the radiation background were not revealed.

The reason for the death of saigas is the disease of pasteloses. The number of buried saigas reached 113,309 heads in the Kostanay oblast, including 65,508 heads in the Amangeldi district, and 47,801 heads in the Zhangeldi district.

Radiation situation

There are no uranium mining and processing enterprises in the territory of Kostanai oblast.

Observations of the level of gamma radiation on the terrain are carried out daily at 6 meteorological stations (Zhitikara, Karamendy, Karasu, Karabalyk, Kostanay, Sarykol) and at 3 automatic stations for monitoring atmospheric air pollution in Kostanay (No.2,4) and city of Rudny (№5).

The average values of the radiation gamma background of the surface layer of the atmosphere along the settlements of the region were in the range 0.04-0.19 $\mu\text{Sv} / \text{h}$. On average, the radiation gamma background in the region was 0.12 $\mu\text{Sv} / \text{h}$ and was within acceptable limits.

Control over radioactive contamination of the surface layer of the atmosphere in the territory of the Kostanay region was carried out at 2 meteorological stations (Zhitikara, Kostanay) by sampling air with horizontal plates. The station conducts a five-day sampling.

The average daily density of radioactive fallout in the surface layer of the atmosphere in the region varies between 0.7-3.1 Bq / m². The average density of deposition over the region was 1.2 Bq / m², which does not exceed the maximum permissible level.

Waste

In comparison with 2014 there was a decrease in the volumes of generation and disposal of industrial wastes in general in the region. So, in 2015, 269.5 million tons were produced, which is 16.5% less than in 2014 (322.9 million tons), table 2. It is located in 2015, 206.3 million tons, That is 23.4% less compared to 2014 (269.3 million tons). Analysis of the comparison of data showed that 53.4 million tons of wastes were reduced at the enterprises by measures to fill the worked-out quarry with overburden rocks, rational use of rock overburden for backfilling of mine shafts, processing of rock overburden with obtaining fractional crushed stone.

All mining enterprises have a waste management system that includes all stages of the waste technological cycle, such as the prevention and minimization of waste generation, accounting and control, the accumulation, as well as the collection, processing, disposal, transportation, storage and disposal of production waste.

Means of Chemicalization

The main problem, which the environmental inspection focuses on when inspecting agricultural formations, is the violation of environmental requirements when carrying out chemical processing of agricultural crops, violation of the requirements for storage of pesticides.

Work was carried out on the chemical treatment of crops against weeds, diseases and pests of agricultural crops. In total, chemical treatments were carried out on an area of 5,298,134 thousand hectares, including treatment against pests -1547,735 thousand hectares, against weeds - 3555,877 thousand hectares, against diseases - 394,522 thousand hectares. Spent: herbicides - 2336093 liters, fungicides - 85759 liters, insecticides - 95438 liters. Spent on dressing seeds 51790 liters of tons of disinfectants, etched 164720 tons of seeds.

The agricultural producers of the region bought and imported into the soil in 2015 10 thousand tons of mineral fertilizers. The fertilizer area in 2015 was 276 thousand hectares.

In Kostanay oblast there are 9 operating standard pesticide storage facilities with the volume of pesticides (pesticides) placed in them of 1,200 thousand tons. In addition, there are temporary temporary stores in agricultural enterprises for short periods of storage of pesticides (they are imported for the period of seed dressing, chemical treatments against weeds, diseases and pests of agricultural crops). Temporary adjusted warehouses are used in May-July.

The import of the chemicals to the Kostanay region is carried out by enterprises licensed to import into the Republic of Kazakhstan from the Committee for Industrial Development and Industrial Safety of Kazakhstan: LLP "Pesticides", LLP "BASF Central Asia", LLP "August Kazakhstan", LLP "Ivolga-Holding" and LLP "DuPont Kazakhstan".

Enterprises involved in the import of pesticides use standard warehouses of enterprises under contracts: Sharua LLP, Ivolga-Holding LLP and Agrokhimservis LLP.

In the region there is a polygon-burial ground of toxic wastes-pesticides, which is assigned to the legal person-enterprise of Sharua, LLP, Kostanay. Pre-pack for nine months is collected and stored in a typical chemical deposit of Sharua LLP in the city of Kostanay, and then buried in the fall at the Kizbel range in the Naurzum district. In 2015, 637.4 tons of waste chemical waste products were placed and buried at the landfill.

Renewable energy sources

Based on point 7 of the Action Plan for the Development of Alternative and Renewable Energy in Kazakhstan for 2013-2020, approved by the Government of the Republic of Kazakhstan on January 25, 2013, a Plan of Measures for the Development of Alternative and Renewable Energy in the Kostanay Region for 2015-2020 (hereinafter - Plan).

For approval of the Plan, the resolution of the maslikhat developed a resolution of the Akimat of Kostanay oblast "On the introduction of the Plan of Measures for the Development of Alternative and Renewable Energy in the Kostanay Region for 2015-2020 for approval at the session of the Regional Maslikhat" dated April 2, 2015 No. 132.

In Kostanay oblast 2 projects on construction of wind power plants are being implemented:

- "Construction of a wind park with an installed capacity of 48 MW in the vicinity of the city of Arkalyk", "KazWindEnergy" LLP

Resolution of the akimat of Kostanay oblast dated June 21, 2012 №284 The project is included in the regional Map of industrialization.

Also, it is planned to implement the project "Construction of a wind farm 1.5 MW in the area of 35/10 kV Substation Krylovka in the Sarykol District of Kostanay Region" LLP Alatau EnergoTrade Limited.

To implement this project, the Akimat of the Sarykol District allocated a land plot of 3 hectares (an act for the right of temporary paid (long-term, short-term) land use.) Feasibility study of construction and scheme for issuing capacity of a wind power station in the area of 35/10 kV Substation "Krylovka" The enterprise has been included in the list of energy producing organizations using renewable energy sources by the decision of the Ministry of Energy of the Republic of Kazakhstan. After the commissioning of the station, will conclude a contract for the sale of electricity with the settlement and financial center at tariffs determined by the Government of the Republic of Kazakhstan, and work is underway to conclude a contract for the supply and installation of a power plant.

To date, the company has spent about 5.022 million tenge, of which 3,361 million tenge was spent to develop the feasibility study and the scheme for issuing the capacity of the wind farm.

Financing of the above projects is carried out at the expense of shareholders' own funds and borrowed funds of investors.

2.4 Analysis of environmental situation and food safety in the Zhambyl region

Taraz is the oldest city in Kazakhstan, the administrative centre of the Zhambyl region. It is located in the south of the country, near the border with Kyrgyzstan, on the Talas River. Zhambyl region is located in the south of Kazakhstan and borders on the north with Karaganda, in the west with South Kazakhstan, in the east with Almaty region and in the south with the Republic of Kyrgyzstan. The total area of the territory in the administrative borders is 145.2 thousand sq. Km, taking into account the long-term land used outside the region - 153.14 thousand sq. Km. The territory of the region stretches for 400 km from north to south, 500 km from west to east. The Zhambyl oblast, which receives about 76.5% of surface water resources

along the Shu, Talas and Asa rivers from the adjacent Kyrgyz Republic, based on the Regulations on the division of the runoff of these rivers between the Republic of Kazakhstan and the Kyrgyz Republic, is actually in conditions of limited water use.

In Taraz, small and medium-sized food enterprises. All these industrial enterprises also pollute the water, atmosphere, biosphere and environment of our city, throw their waste, garbage, and spoil our ecosystem into the environment. Food enterprises of Zhambyl region: Merken branch of LLP "TsASK" (sugar factory), LLP "Merkenensyrzavod", Taraz sugar plant - branch of LLP "ZASK", LLP "Food KZ", LLP "Kulikov and K", Confectionery "Gala", Sausage Shop, Taraz baking Bakery, KazAgroFinance, Myasnoy Mir LLP, Metelitsa pelmen shop, Galenika LLP, Konservny Zavod LLP, Evrazian Foods Corporation, Zhambyl Nankhlebzavod LLP, Representative Office JSC "Almaty margarine factory", Dairy kitchen "Kok zhyek" tb [13].

Observations of the state of atmospheric air pollution in the region are uneven. Stationary observation stations, where regular air sampling is performed, are available only in the city of Taraz. The ecological state of the environment of the city of Taraz has stabilized over the past three years.

The underground waters of the Zhambyl region, as a whole, the entire water management system, is under an intensified anthropogenic impact - more than 70 large and medium-sized enterprises operate in the region. As a result of irrigation reclamation in some areas of the lower reaches of the Talas, Assa and Shu rivers, the ecological situation has significantly deteriorated. The groundwater levels in the wells have drastically decreased, many lakes have dried up, haymaking grounds have decreased. The data of the regime observations on the departmental observation network of the wells obtained by the Zhambyl GGE show a close hydraulic connection between surface and groundwater, especially in the areas of the Karatau-Zhambyl industrial hub; Confirm the weak protection of aquifers from surface pollutants. In this regard, there must be the highest requirements to the quality of treatment plants, industrial waste storage facilities, etc. One of the most known toxic components of groundwater is fluorine. With a background content of 0.2-0.4 mg / l, its concentration in the groundwater adjacent to the Gorvodokanal settling tanks reaches 5-7 mg / l in individual months, with an average of 1-1.5 mg / l during the year. A similar picture is noted on the filtration fields of a superphosphate plant (up to 1.5 mg / l).

To study the migration of fluoride in groundwater, about 200 tests were performed in observation wells and in 30% of cases the MPC was exceeded (1.2 mg / l). Distribution of the area from the ponds - sedimentation tanks is up to 5-6 km, to a depth of more than 30 m. Thus, an increased fluorine content along the direction of the ground flow was found in the ground waters of the village of Kostyube, crossing 5, Uch-Ilyich, Birlis, etc. [14].

Thus, the main sources of fluorine-containing groundwater are industrial facilities, evaporators, storage tanks, etc. Technical reservoirs, which intensively feed the horizon of subsoil waters with substandard waters; the second is the domestic wastewater entering the filtration fields and seeping into the ground.

Safety of food products in the Zhambyl region

Nowadays the quality and safety of food products are one of the most pressing problems. Food should not only meet the body's nutritional and energy needs, but also perform preventive and curative functions. Up to date, there is a lack of products that increase the resistance of the human body to various diseases.

According to the concept of a healthy lifestyle and nutrition in the Republic of Kazakhstan, one of the negative consequences for the transition period were increasing the population

proportion, for whom full consumption of pure food products is unavailable; a volume decrease of agricultural production and a massive supply of new, often low-quality imported goods to the domestic market. The nutritional deficiency is mainly related to meat, dairy and fruit and vegetable food categories, which leads to insufficient intake of animal protein, vitamins C, A, E and a number of micro elements (iron, selenium).

Along with the deficit of basic food products consumption, the tendency of transition to "heavy" and unbalanced diets with a predominance of saturated fats, carbohydrates, insufficient vitamins and microelements, with high energy value is preserved among certain population groups. The latter contributes to the growth of morbidity and mortality from cardiovascular pathology, obesity, diabetes, etc.

One of the undeniable priorities of Kazakhstan Republic state policy in the field of population's healthy nutrition is the technology development for the production of qualitatively new food products with a directed change in the chemical composition, including products of therapeutic and prophylactic use.

2.5 Analysis of environmental situation in Atyrau region

The population is more than 594 thousand people, area territory - 118.6 thousand square km (4.35% of the total area of the country). There are 2 cities, 7 rural areas, 2 cities, 15 townships and 56 rural districts in the region.

The sustainable development of a particular city, region or whole state implies a development that ensures economic growth, reduces the environmental burden on the environment and meets the needs of society as much as possible, not at the expense of future generations.

For Kazakhstan, the sustainable development of the Atyrau region is of particular importance not only because of huge oil and gas reserves and significant investments, concentrated here and used in the development of hydrocarbon resources, which should improve the quality of life of the population of the Caspian region and the entire nation of Kazakhstan, but also because city of Atyrau is located in the coastal zone of a large inland water basin and, with unreasonable environmental policy, this can lead to increased pollution of the marine environment and lead to disturbances in marine ecosystem, ultimately adversely affecting the well-being of people.

The terrain is flat. Four large rivers flow through the region, there is one lake. The main waterway of the region - the Ural River flows into the Caspian Sea 45-50 km south from the city of Atyrau. According to the nature of the soil cover and vegetation, the territory is divided into 4 zones: seaside, riverine floodplain, semi-desert-steppe and sand zone. The forest area occupies just over 1% of the territory.

The Caspian Sea is a unique inland reservoir with rich reserves of valuable fish species - beluga, sturgeon, stellate sturgeon, thorn, carp and many others.

The state of the sea and the coast directly depends on the effective management of the basins through which fresh water flows into the sea. Unfortunately, the importance of observing environmental norms and laws has not yet taken root in the minds of people, therefore the initiatives of civil society, scientists, educators, activists of public and non-governmental organizations are called upon to play an important role. The main factors ensuring the sustainable and long-term state of marine ecosystems are development of scientific research and observations of the state of the seas and oceans.

Economy of the region

Priority directions of development of economy of Atyrau oblast are fuel-energy, processing, agro-industrial and fishing industries, production of building materials.

The highest share in the structure of industrial production is occupied by the extraction of crude oil and associated gas, distillation of oil, production and distribution of electricity.

Ecological situation in region

Atyrau region occupies a special place among the regions and zones of ecological disaster in Kazakhstan. The ecological situation here is formed under the influence of natural and anthropogenic factors, the most important ones are an increases of sea level of the Caspian Sea and the rapid development of the oil and gas complex. Increase of sea level can lead to the emergence of zones of hydrogen sulfide contamination both in connection with the death of plants in shallow waters, and as a result of flooding of existing oil and gas fields, the territories of which are polluted with oil products.

Increasing oil and gas production, high aggressiveness of extracted raw materials influence the processes of intensive pollution of the atmosphere, surface and groundwater, and through them - soil and vegetation cover, in which heavy metals, radionuclides and oil products accumulate.

Solid particles, sulfur dioxide, carbon monoxide, nitrogen oxides and hydrocarbons in the Atyrau region are released into the atmosphere during the exploitation of oil fields. The environmental situation in the city of Atyrau has sharply deteriorated because of the pollution of the city's air basin by mercaptan vapor, belonging to the second class of danger. Another significant source of pollution is the city transport.

Together with oil, large amount of associated formation water is extracted, as well as gas that is not properly disposed of. Some of the oil products enter the sea during the operation of coastal oil wells and their flooding, transportation of oil by water, with wastewater from various enterprises.

Environment and Water Resources

One of the main problems of the Atyrau oblast is the emission акщъ large enterprises into atmosphere. The analysis shows that of the total amount of emissions the main share in the air pollution of the region is made up of sources of oil and gas producing and oil refining industries.

In 2016, the State Environmental Inspectors of the Department identified 29 violations of the environmental legislation of the Republic of Kazakhstan, in particular, on compliance with the requirements for the protection of water resources. Of these, a decision was issued on termination of 2 and on warning 1. A total of 28 legal entities and individuals were brought to administrative responsibility in the amount of 763,560 tenge. 21 administrative fines for the amount of 604,485 tenge were collected on a voluntary basis.

The lack of sewage treatment plants adverse effect on the environment area. Ponds evaporators are located in a natural lowering of the terrain with a device for dumping in the form of an earthen dam. Ponds evaporators with a total area of 520.13 ha with a total volume of 15,600 m³, a depth of 3 meters. The Environmental Department of the Atyrau Oblast annually carries out maintenance work on a contractual basis - a round-the-clock roundabout around the perimeter, control over the state of the territory, mowing grass and reeds and removing them from the territory, monitoring the state of dumping and timely warning and prevention of detected violations in the pond-evaporator area. The technical condition of the pond-evaporator padding is constantly monitored and, if necessary, strengthened. According to

the contract No. 113-15 of 06.02.2015, reinforcing works on embankment evaporation pond.

Observation towers are installed along the perimeter of a pond-evaporator with a height of up to 10 meters in the amount of 2 pcs. An embankment road was built inside the pond for the purpose of accessing equipment up to 1000 meters long. Warning signs are installed in five places all over the perimeter of residential area: "Livestock grazing is prohibited", "Use of open fire is prohibited", "Access of unauthorized persons to the industrial zone is prohibited", "Draining oily water is prohibited".

Production and consumption wastes

According to the reporting data, in 2016, 4,556.578 (in 2015 - 4,298.475) thousand tons of waste were accumulated in the region, including 133,000 tons of sulfur (in 2015 - 9,983) thousand tons, production waste of 776.207 (in 2015, 1 330.922) thousand tons and solid domestic waste 3,626,504 (in 2015 2,957,570) thousand tons. In general, production wastes are formed as a result of development of oil and gas fields, storage, transportation of hydrocarbon raw materials and from construction works.

On industrial waste. The total amount of industrial waste generated by the end of 2016 was 203,409 (in 2015 - 319,2695) thousand tons, and 144,243 (in 2015, 9,983) thousand tons of lumpy sulfur formed as a result of the activities of Tengizchevroil LLP.

Waste Processing Program

The purpose of the project - the purpose of this program is to assess the additional processing opportunities to further reduce the amount of waste placed on the landfill. Continue the development of a waste treatment culture in TCO and among its contractors.

Expected environmental effect: Increase in the volume and types of waste to be recycled. Promoting a waste management culture among TCO employees and contractors. Support the development and growth of the share of Kazakh content among companies involved in waste processing.

Projects for the management and study of sulfur maps. The purpose of this program is to conduct a research to study and test various materials for sheltering sulfur during storage.

Expected environmental impact: Understanding the benefits of various materials intended for shelter.

On the landfills of toxic waste. In 13 enterprises of the region there are 26 polygons for placing toxic waste. To solve the problems of solid waste management in the city of Atyrau, it is envisaged:

- First, the construction of a new landfill with a sorting complex with a capacity of 100 thousand tons a year;
- Secondly, reclamation of the old (operating) landfill on an area of 35 hectares;
- Third, the renovation of the fleet of special equipment.

In the current year, Akimat of the city of Atyrau allocated 50 million tenge for the development of design estimates for the work on reclamation of the existing landfill and 70 million tenge for the development of design estimates for the construction of a new waste landfill with a sorting complex. To date, the preparation of documentation for the competition on public procurement

If the project is successfully implemented in accordance with international standards, the sanitary-epidemiological, ecological state of not only the city, but also the whole region, will improve significantly.

Municipal solid waste.

LLP "Spetsavtobaza" tries to cover the whole population of Atyrau city on export of solid waste, which is practically impossible and is currently one of the reasons for the formation of spontaneous dumps.

The problem of the formation of spontaneous landfills on the territory of the region is also caused by the absence of a central collection of solid domestic waste on the territory of the private sector and not an improvement in the system for collection of solid waste.

Every year, in order to maintain the sanitary condition of the settlements of the region, a spring-autumn two-month sanitary cleaning and landscaping program is carried out. Formed spontaneous dumps in the period of spring-autumn two-month period is eliminated. However, this is temporary and does not solve the cardinal issue.

In this prospect, it is necessary to improve the system of collection, transportation, sorting, separate storage by types of waste.

For garbage processing plants and the development of a business for waste processing, including mercury containing, medical waste and POPs.

In accordance with the Program for Modernization of the Solid Waste Sector in Atyrau of Ministry of Environment and Water Resources of the Republic of Kazakhstan, a land plot of 50.0 hectares for a landfill and a complex will be used for processing solid waste in the city of Atyrau on the territory of the Almalinsky rural district of Makhambet district.

Now, there is developed a pre-budget estimate documentation and is under consideration in state expertise. For further implementation of this project, JSC "Center for Kazakh Public-Private Partnership" was considered as a concession project. In this regard, Memorandum on the construction of a complex for processing solid waste was signed between JSC "National Company" Social-entrepreneurial corporation "Atyrau" and Austrian company "MAG REDIT INVEST COMPANY". The preliminary amount of the project together with VAT is 51.0 million EUR. The landfill has the capacity to keep 1.859 million m³ of solid waste.

West Dala LLP has a waste management complex and the following equipment is used for the neutralization of waste on the territory of the region:

- Incinerator IN-50.5M is designed for incineration and neutralization of domestic and industrial waste;
- Incinerator IN-50.02 is designed for high temperature neutralization of medical waste;
- thermo-demercuration unit URL-2M is designed for thermal demercuration (removal of mercury from) fluorescent lamps of all types, as well as burners for high-pressure mercury lamps of type DRL;
- installation of "Alpha-9U-1". Plant for processing of organic waste;
- installation of "Alpha-9U-2". Installation for the processing of acid-base neutralized electrolytes;
- installation of "Alpha-9U-3". Plant for processing (regeneration) of transformer, motor, industrial oils;
- installation of "Alpha-7-NP". The plant for the purification of sewage by electrochemosorption;
- installation of "Alpha-9U-400 GK". Installation for the utilization of gas condensate (waste gas industry) to produce gasoline and diesel fuel.
- Installations for the utilization of oil-contaminated soils "UZG-1MM, UZG-1M.

LLP "West Dala" also collects mercury-containing waste, and the collection is carried out in cylindrical or rectangular metal hermetically sealed containers of 600 mm, 1200 mm, 1500 mm length.

Neutralization of mercury-containing waste is carried out by demercurization at thermo-demercurization unit URL-2M at a temperature of 300 ° C followed by freezing off mercury vapor with liquid nitrogen in deep vacuum trap on the surface of which condensation of mercury vapors draining into the collector after defrosting the trap occurs.

Lamps of all types of LB ILD are utilized at the URL-2M installation. The glass formed after demercurization after accumulation of a certain volume is transferred to a complex landfill for processing and disposing of waste for disposal in an equipped cell for hazardous waste.

Plastic containers and polyethylene bags of various sizes are used to collect medical waste. Neutralization of medical waste is carried out on the IN50.02K unit, at a temperature of 900 ° C. Refrigeration room is provided for temporary storage of medical waste prior to disposal. The ash that is generated after the incineration of medical waste is transferred for burial to its own complex landfill.

In addition, "West Dala" LLP plans to purchase a rotary incinerator for the incineration of hazardous waste. This unit is designed for processing different types of waste with different types of components and forms (oil sludge, oil, liquid chemical waste, small amount of salt-containing waste).

In addition, the disposal of medical waste is handled by Danat-M IP, which in turn has furnaces for the incineration of medical waste. In addition, state medical institutions in the region, at the expense of the state budget, purchase muffle furnaces, in which medical waste is burned, which is reflected positively by the reduction of medical waste.

During the reporting year were disposed 8.55 tons of mercury-containing and 21 tons of medical waste. In order to prevent the release into the environment and the spread of PCBs in it, by Order No. 40 of the Minister of Environmental Protection of the Republic of Kazakhstan of 24 February 2012 have been developed and approved "Rules for handling persistent organic pollutants and wastes containing them" ("*Rules*").

On historical pollution and ownerless waste. At the end of the reporting period, in the territory of Atyrau region, in connection with the specification of the boundaries of the mining site, the total area of the "historic" contaminated sites was 12 hectares and all of them are located in the contract areas of JSC Embamunaigas.

Earlier, according to the information provided on the contract territory of Tengizchevroil LLP, 13 ownerless dumps with a total area of 49.93 hectares were discovered.

Department of Ecology in accordance with the requirements of the legislation of the Republic of Kazakhstan for the purpose of taking measures, sent a letter to the local executive body, in whose territory the ownerless waste was identified (Akimat of Zhylyoi region). However, effective measures have not been taken until this day. In this regard, we have put this issue before Akimat of Atyrau region.

On the registration of contamination sites. The Department of Ecology from 2008 to 2016, in accordance with the Rules for maintaining the state register of contamination sites, approved by Resolution of the Government of the Republic of Kazakhstan dated 03.07.2007, No. 566, registered 241 passports of contaminated sites.

161 passports of contaminated sites out of them were developed by Tengizchevroil LLP, 1 passport for LLP "Plainnoye Oil", 3 passports for LLP "Samek International" and 76 passports for

JSC "Maten Petroleum".

Currently, in connection with the liquidation of contaminated sites (recultivation), 82 passports have been excluded from the register, of which 9 passports of Tengizchevroil LLP, 1 passport of Plainoe Oil LLP and 72 passports of Maten Petroleum JSC.

It is necessary to develop a special national program for the sustainable economic growth of the Caspian region in particular, the improvement of the quality of life through the rational and safe development of the hydrocarbon resources of the Kazakh sector of the Caspian Sea, the development of related industries of the country.

The Program should include ensuring the sustainability of the development of oil and gas complex, developing production of building materials for transportation systems, modernizing the machine-building industry, developing its own scientific and technological base, protecting people's health and the environment, and improving the quality of life of the population.

3 EDUCATIONAL AND RESEARCH WORK IN SUSTAINABLE DEVELOPMENT OF KAZAKHSTAN

Ecological education in Kazakhstan

Environmental education is a continuous process of education, upbringing and development of the individual, aimed at developing a system of scientific and practical knowledge and skills, as well as value orientations, behavior and activities in the sphere of environmental protection, sustainable use of natural resources and consumption, and the formation of an ecological way of life.

As noted in the Strategic Documents of Kazakhstan:

- formation of continuous environmental education;
- introduction of environmental issues and sustainable development in the curricula of all levels of education;
- training of specialists, retraining and advanced training of personnel in the field of ecology;
- state support of environmental education

is necessary for the development of environmental education, as the basis for the formation of the ecological culture of society.

Pre-school ecological upbringing and education

Pre-school ecological education and education is the first step in the system of continuous environmental education, a step designed to explain the basic information about ecological literacy to children.

The state compulsory standard of preschool education and training approved by the Decree of the Government of the Republic of Kazakhstan of August 23, 2012 No. 1080 determined that the content of preschool education and training is based on five educational areas: Health, Communication, Cognition, Creativity, "Socium", which is realized through their integration through the organization of various activities. And the organized educational activity in the educational sphere "Social life" includes:

- 1) self-education;
- 2) acquaintance with the surrounding world;
- 3) basics of ecology.

Mini-ecological centers have been established in kindergartens. Structural components of ecological centers are allocated in the following way: indoor and artificial plants, seasonal plant objects (for example, winter garden); objects of the animal world (fish and snails in the

aquarium, birds, mammals, seasonal living objects of temporary content, for example earthworms, insects); laboratory material, nature calendar, mock-ups, museum and collection materials, problem garbage containers - are designed to collect secondary raw materials, which are then used in children's creative activity.

Classes are organized in a game form with use of variety of techniques: game learning situations, creative and exploratory moments, problem situations, modeling, and many others where children display creative and mental abilities. Excursions in natural setting introduce children to the world around them, help bring them closer to themselves, feel themselves in it. Through walks, observations, children accumulate sensory experience, show curiosity, observe. Environmental actions - this is one of the non-traditional forms of work that are aimed at the formation of ecological culture of adults and children. In studies and experiments, the child acts as a kind of researcher. He independently learns to ask questions to nature and receive answers from them. Labor learning forms necessary skills for caring for living organisms, a sense of responsibility for them.

Suggestions

To develop the skills of conservation and rational use of natural resources, it is possible to create a cycle of animated films of the Russian Arkady Parovozov type, where Arkady Parovozov is talking on what can and should not be done in a very interesting form. After a fun story, children fix new knowledge in various mini-games. Each such unusual lesson ends with individual advice from Arkady Parovozov. The created cartoon, aimed at environmental education and upbringing, can be recommended for viewing at children's classes in kindergartens.

Another example, a training manual that was published by Judy Friedman for kindergartens ("Jelly Gem - the defender of people") in Central Asia, with the support of the United Nations, where in parallel with the skills of drawing given foundations of ecological behavior and outlook, which is an example of the integration of some classes into others, their connection with the environment and the creation of new innovative teaching aids.

Secondary school ecological education

Secondary school environmental education is the second stage in the system of continuous environmental education. Basics of ecological knowledge are presented in the course "Natural History" and partly in the courses "Man and Society" in the initial classes. The content of secondary school education includes seven educational areas, including "Natural History", which includes: "Cognition of the World", "Natural History", "Geography", "Biology", "Physics", "Chemistry", which in one way or another Environmental aspects. The content of the educational field "Natural Science" is realized in the educational subject "Natural History". The content of the subject "Natural Science" is intended to provide an elementary level of scientific knowledge within the framework of the "Man - Nature" system. This subject is aimed at developing the natural curiosity of students, research skills, the formation of scientific understanding and vision of the surrounding world. In the educational field "Man and Society" subjects "Man. Society. Law" and "Self-knowledge" are also aimed at environmental education, affecting the education of a humane attitude to man and the environment.

Ecological education in higher educational institutions

The formation of environmental education in higher education institutions is ensured by introduction in each educational institution of programs for continuous education and training of students in the field of ecology, rational nature management and environmental protection.

In many Kazakhstani universities, faculties, departments, research laboratories are functioning in accordance with the qualifications classification, personnel training is conducted on environmental issues.

For example, annually in the universities of Western Kazakhstan, environmental specialists are trained in 7 educational institutions, specializing in 5B060800-Ecology and 2- on specialty 5B073100 - Life Safety and Environmental Protection.

Training is conducted on fee basis and based on state grants. Graduates of universities are distributed to committees on environmental protection, large enterprises, specialized laboratories for environmental protection, etc.

Environmental education in the field of "green policy" in S. Seyfullin Kazakh Agrotechnical University

S. Seifullin Kazakh Agrotechnical University is implementing a scientific project jointly with the Institute of Geography of the People's Republic of China "Joint technical study on the creation of environmental protection in developing cities of the economic belt of the Silk Road at the moment."

Since 2015, the University is implementing the EU Erasmus + SARUD project "Sustainable Development of Agriculture and Rural Territories" in cooperation with the University of Hohenheim, Germany.

The modern high-tech greenhouse complex "Astana EcoStandard", put into operation in February 2012, has reached its full design capacity. The total area of the greenhouse is three hectares, on the basis of which a class was created by S. Seifullin. Kazakh Agrotechnical University.

Environmental education in Zhangir Khan WKATU

Analysis of educational programs for "green" knowledge and skills

Preparation for the bachelor and master's degree "Ecology" at the Department of Ecology and Nature Management implies teaching students "green" skills and knowledge at Zhangir Khan WKATU. Through training various environmental disciplines, students become acquainted with skills to apply modern environmental approaches: pollution prevention, pollution limitation, cleaner production, waste management, sustainable development, environmental management, integrated water resources management, landscape approach, etc. The training program also provides training Skills for life: environmental services, cooperation in the environmental field.

In addition, students have the opportunity to develop "green" skills and knowledge in the framework of additional education (winter schools) and practical-oriented training (retreats, professional practices). With the existing practice of applying enterprises of "green" directions of the economy, students get acquainted during regular meetings with representatives of industrial enterprises and state bodies in the field of environmental protection (open lectures, events).

Training on other educational programs of Zhangir Khan WKATU "green" skills and knowledge until recently was built on a two-step model: 1) compulsory discipline "Ecology and sustainable development" in all university professions, 2) eco-oriented professional discipline or special sections on environmental protection/Individual resources in the programs of professional disciplines. Currently, green skills and knowledge are taught through the elective course "Ecology and sustainable development" (at all five faculties), ecologically oriented professional disciplines (specialty "Life safety and environmental protection"), special sections in the programs of professional disciplines (other specialties).

Environmental education in A. Baitursynov KSU

Training in the bachelor's specialties "Ecology" and the Master's program "Geoecology and management of natural resources and nature management" at the Department of Ecology implies teaching students "green" skills and knowledge. Through training in various environmental disciplines, students become acquainted with and acquire the skills to apply modern environmental approaches: pollution prevention, pollution limitation, cleaner production, waste management, sustainable development, environmental management, integrated water resources management, landscape approach, etc. The training program also provides Skills training for life: environmental services, cooperation in the environmental field.

In addition, students have the opportunity to develop "green" skills and knowledge in the framework of additional education (winter schools) and practical-oriented training (retreats, professional practices). With the existing practice of applying enterprises of "green" directions of the economy, students get acquainted during regular meetings with representatives of industrial enterprises and state bodies in the field of environmental protection (open lectures, events).

Training in other educational programs of the Baitursynov KSU "green" skills and knowledge until recently was built on a two-stage model: 1) compulsory discipline "Ecology and sustainable development" in all 33 specialties of the university, 2) eco-oriented professional discipline or special sections on protection Environment / individual resources in the programs of professional disciplines. Currently, green skills and knowledge are taught through the elective course "Ecology and Sustainable Development" (3 faculties out of 7), eco-oriented professional disciplines (specialties "Jurisprudence", "Economics", "Accounting and Audit", "Marketing" , "Power Engineering"), special sections in the programs of professional disciplines (other specialties).

In addition, direction of training "Sustainable Agriculture and Rural Development" is being developed and will be put into operation this year in the Master's Degree "Economics". The plan includes developed new modules "Bioeconomy", "Environmental concepts and agriculture. Sustainable Development ", " Environmental Marking and Marketing of Ecological and Regional Products of Rural Territories ", Management of Biological Resources of Rural Territories" and "Organic Agriculture".

Atyrau State University named after Kh. Dosmukhamedov, Department of Chemistry and Ecology operates, training bachelors in the specialty 5B060800-Ecology and Masters in the specialty 6M060800-Ecology. The department has the human and scientific potential necessary for the educational process.

Training of environmental specialists is conducted in accordance with the Model curricula, Professional standards "Ecology and rational use of natural resources" and "Ecology and nature protection activities (by types)".

The bachelor's program includes a system of courses aimed at studying natural, anthropogenic, natural-economic, ecological-economic, industrial, social, public territorial systems and structures at the global, national, regional and local levels, as well as studying state planning, control, monitoring, examination of environmental components of all forms of economic activity; study of education, upbringing and public health, demographic processes, sustainable development programs at all levels.

The Master's program includes system of courses aimed at studying, analyzing and summarizing results of domestic and foreign research in various fields of ecology. The scientific theme of master's theses is chosen in accordance with the plans of the partnership relations of the Department of Chemistry and Ecology with academic and industrial institutes.

Activities of Atyrau University

In order to attract young people to science and to train young scientists of new generation, in June 2012 was established Educational and Research Center "Ecology". The goal of the center is the implementation of scientific research, scientific and industrial works and environmental monitoring of the main parameters of the aquatic environment and bioresources - Ural-Caspian basin.

Directions of work conducted by center: preparation of masters of specialty "Ecology"; base for conducting practical classes and performing thesis for specialties "Ecology", "Chemistry", "Water resources and water use", "Fisheries and industrial fishing", "Geography"; study of the hydrological-hydrochemical regime of Ural-Caspian basin; assessment of the level of toxicological water pollution in the Ural and Kigach rivers; studies of toxicology of food products; study of ecological condition of air basin of the city of Atyrau in residential areas, in transport arteries and in industrial zones; determination of the content of heavy metals in soil and soils; determination of the content of heavy metals in biological materials.

The laboratory "Toxicology" of the Ecology Center is certified in the following fields of activity: drinking, natural waters, sewage and groundwater. In the future, we intend to certify the atmospheric air of the working area in the directions; ground, soil, food, biological materials.

The material and technical base of the laboratory is the newest measuring and auxiliary devices. Sampling for analysis is carried out by modern sampling equipment. Wide range of methods are used while performing the analyzes: titrimetric, spectrophotometric, potentiometric, fluorimetric, chromatographic, atomic emission spectrometry, IR spectrometry, etc. During the analysis, automatic measurement control is performed, which improves their accuracy.

Six scientific seminars were held together with the Atyrau Institute of Oil and Gas during Center's work. Employees of the state nature reserve "Ak-Zhayyk" and scientific staff of the Kazakh Institute of Fisheries were invited to participate as guests in seminar. Topics of the seminars are devoted to the actual environmental problems of Atyrau region and the Western region.

Employees of the center and undergraduates participate in scientific conferences of national and international significance. Students of 2,3,4 courses of the specialty "Ecology" are involved in the work of the scientific club "Ecos". They participate in scientific research on the ecological and toxicological state of water bodies in Ural-Caspian basin. They also have their own environmental projects, with which they participate in various republican scientific competitions of students. In 2013 and 2014 students of our university became owners of Grand Prix at Republican contest "Zhandanu". Environmental students constantly attend public hearings and actively participate in the discussion of environmental problems in the region.

Schoolchildren of Atyrau perform their scientific work in the educational and research center "Ecology". For example, a pupil of the 11th form of the Kazakh-Turkish Lyceum took the 2nd prize at international contest held in Seoul.

Employees of the center won a state grant for 15 million tenge for a period of 3 years with project "Investigation of the current toxicological state of the Ural-Caspian basin". Expeditionary surveys on the Northeast Caspian are currently being carried out to carry out the project. The project involves doctoral students, undergraduates and students. Some parts of the study are conducted jointly with scientists from Nazarbayev University. Modern equipment and equipment for the university are purchased from the project funds.

The Educational and Research Center "Ecology" received a state license to carry out works and provide services in the field of environmental protection. In the future, it prepares for the accreditation of the laboratory and the expansion of ties with the industries.

Sustainable development

Given the severity of environmental problems at various levels, the priority of environmental education in the country's politics, Atyrau University is responsible and educates university community towards a sustainable future in cooperation with organizations at the local, regional, national and global levels.

For this purpose, "Eco-campus development program", was developed and included in the Development Strategy of Atyrau State University, Kh. Dosmukhamedov, for 2017-2020., and it develops and implements new educational programs in the field of ecology; landscape design and landscaping of the campus; organization of healthy food items, waste management, recycling, waste management, sorting and disposal; aims to use environmentally friendly raw materials for the economic needs of the university, supports the policy of water conservation and energy conservation; conducts educational programs and forms eco-friendly habits. Teachers and students participate in eco-projects and promotions, engaged in research and project work on environmental issues.

During the functioning of the program, were published 3 volumes of the monthly ecological bulletin "Kuralai", which covers information on sustainable development issues.

The University together with the Turkish company TEKSAN at EXPO-2017 will present 2 projects. These projects are presented as alternative sources of energy.

Environmental lifelong learning

After graduating from a higher education institution, a person continues to study independently in the course of work, communication, etc. Separate television channels, websites of non-governmental nature protection organizations, environmental information sites and portals have been created, but not everyone is ready to spend time looking at information on them.

Information on the concept of environmental sustainability, the role of man in this, almost does not appear on television screens, the Internet, on the street, in the buildings where he works, restaurants and institutions that he visits. We have more advertisement of goods and services.

3.2 Research work in food production (on the example of TarSU)

Research laboratory of engineering profile "Nanoengineering methods of research" of Taraz State University named after M.Kh. Dulati is engaged in the development of food products for functional and therapeutic purposes. The range of products in this group is very diverse: bakery products with leaven seed, algae, bakery products with the introduction of Chinese tree fungus "Muer", an ethnic fermented milk product "coirtpack" with flax, jelly marmalade with decoctions of herbal medicines aralia, parmelia, Vegetable drinks with spirulina.

World trends in the development of the food production sector are purposeful and meet the motto: "Prevention is the health of the population and the economy of the state." In this regard, there is a need for the development of new types of products that have a healing effect.

Chronic deficiency of microelements and vitamins in childhood and adolescence adversely affects health and physical development, preventing the formation of a healthy generation. To remedy this situation, it is necessary to enrich the ration of schoolchildren and the adult

population with specialized products. Potential users of research results can be food enterprises: confectionary factories and mini shops, catering enterprises, as well as food enterprises interested in expanding the output of finished products of high nutritional value of functional purpose on the basis of natural plant supplements that contribute to improving the quality and safety of nutrition. Satisfaction with the requirements of consumers - the use of a new product in the therapeutic and preventive aspect.

Here are some of our innovative developments that could possibly have been applied in the production of bakery products. To increase the nutritional and biological value of bakery products, methods have been developed for introducing into the formula the production of bread from wheat flour of the first grade of wood fungus "Muer". Among innovative ingredients, dietary fiber, edible parts of plants or similar carbohydrates, resistant to digestion and adsorption in the human small intestine, completely or partially fermented in the large intestine, is becoming increasingly important both in the food industry and in the formation of a healthy lifestyle. Everyone knows the beneficial effect of dietary fiber, the optimal daily rate of which for an adult should be at the level of 25-30 g. Medical studies have confirmed that wood fungi contain some chemical compounds that slow the process of formation of blood clots. It is due to this property of wood fungi that they can be of great help for the prevention of various diseases of blood vessels, coronary heart disease, heart attacks, the risk of which increases the formation of blood clots. In addition, wood mushrooms contain special substances - immunomodulators, which help regulate the work of the immune system. The extract from the wood fungus has a positive effect on the metabolism of fats, blood pressure and blood glucose levels. Wood mushroom "Muer" is rich in polysaccharides, which prevent the development of malignant tumors in the body. Pressed black wood fungus is a supernatant of iodine, it contains proteins, carbohydrates, a complex of vital vitamins for humans, as well as gelatin, which has an excellent cleaning and oiling property. Wood fungus is an excellent natural antioxidant. For these properties, black fungi are called "aspirin". Daily consumption of 10-15 grams of these fungi can reduce cholesterol, reduce coagulation and reduce platelet aggregation. Eating this product reduces the risk of cancer, clears the lungs (due to the expectorant effect) and the intestine from the ama (products of incomplete metabolism). It is recommended to workers of mining, textile industry, and also enterprises with strong dustiness of air. This combination of beneficial properties of the fungus made it possible to assure with confidence the possibility of its introduction into the bread.

In addition, work on the project "Technology of cooking bread using black Chinese wood mushroom" was the first swallow. The main goal: Development of technology of bread and bakery products of increased food, biological and energy value by adding black wood fungus as a source of protein, vitamins, dietary fiber. In the course of work on the project:

- The qualitative characteristic, physico-chemical and biological properties of the dough during application of wood fungus were investigated;
- The effect of the addition of wood fungus on structural-mechanical and physicochemical indicators of wheat test quality was studied.
- the recipe, technology and technological modes of making bread of functional purpose with the introduction of the indicated mushroom "Muer" have been developed.

In the course of the research it was established that the addition of wood fungus additives during the production of bread influences the intensification of the technological process: the level of gas formation increases 1.3 times, and the fermentation process is reduced by 25%. This is explained by the positive effect of mineral substances on the development of

fermentation microflora. The analysis showed that the optimal application is 10% milled mushrooms "Muer".

Currently, technologies for the preparation of bread and bakery products using various non-baking cereal crops (oats, maize, barley, millet, rice, buckwheat) and bean crops, plant additives, in particular marine origin have been developed and introduced into production. So, nori is a species of Japanese red algae of the species *Porphyra*. Red algae are a valuable food product that contains quite a lot of protein (about 10% -20%), vitamins and trace elements. The unique properties of red seaweed as an immunostimulant allow the body to effectively resist any viral and bacterial infections. In addition, red algae restore the pancreas. In nori, haemagglutinins, bromine and iodine compounds, necessary for the functioning of the thyroid gland and for preventing goiter, are found to be three times more calcium than in milk. It is extremely nutritious, contains beta-carotene, cobalt, lutein, liacin, phosphorus, selenium, silicon, sodium, tin, zeaxanthin, calcium, potassium, magnesium, iron, iodine, manganese, copper, chrome, zinc, vitamins. The natural potassium iodine (KI) contained in the dark red edible alga is digested by the body more slowly and safer than chemical or synthetic iodine. Algae have antitumor, anti-inflammatory and immunomodulating activity, antimicrobial, antimutagenic and antiviral action. Individual iodine prophylaxis involves the use of prophylactic drugs and nutritional supplements that provide a physiological amount of iodine (multivitamins with mineral supplements, potassium iodide preparations). The systematic use of bread enriched with nutrients will help to fill iododefetsit. Based on the conducted research on the nutritional value of the Nori alga in the scientific research laboratory "Nanoengineering methods of research", attempts were made to prepare bread enriched with red alga.

The project "Development of the technology of cooking bread with the use of additives of nori seaweed and super-milled flour from cereals and legumes" set the tasks:

- To investigate the microstructure, qualitative characteristics, physicochemical and biological properties of the dough when introducing nori algae and super-grain crops and leguminous crops;
- to study the effect of additives of nori and super-grain crops and legumes on structural-mechanical and physicochemical indicators of wheat test quality;
- to determine the food, energy and biological values of bread and bakery products with the addition of these additives;
- to develop recipes, technologies and technological modes of cooking bread of functional purpose with the addition of additives of these additives.
- develop technical documentation for new types of bread and bakery products;
- Carry out marketing research and provide a socio-economic justification for the development of bread and bakery products, increased food and biological value, as products of a functional purpose. All the goals were solved. The relevance of the presented development is indisputable. After all, today there is no justification and practical implementation of technological solutions for the use of additives of this composition in the production of bakery products, both functional and preventive purposes in the trade network.

Promotion of new types of bread and bakery products enriched with micronutrients to the market will help to solve several tasks: from the point of view of the state - to maintain the health of the nation, from the producers' point of view - to expand the line of health-improving breads by bringing new original products to the market.

The project "Technological process of production of jelly masses using decoctions of

medicinal herbs" provides for the development of technology, technological regimes and parameters of production, recipe.

In the course of research, it is determined and theoretically justified:

- fractional composition and analytical characteristics of herbal medicinal raw materials, which became the basis for determining the directions of its use for the production of jelly masses of functional purpose;

- developed the formulation and defined technological parameters and

Modes of production;

- The biological value of jelly masses with the introduction of medicinal herbs is studied;

- technical documentation for jelly jelly enriched with micronutrients has been developed (Patent No. (19) KZ (13) U (11) 1649 (bulletin No. 11 of 15.09.2016).

A product of increased biological value was obtained by combining, that is, introducing biologically active additives into a food product of mass consumption - jelly marmalade. The technology of preparation of jelly masses provides for the use of decoctions of aralia and tentacle white as sources of functional ingredients. As a tonic and regulating remedy for the central nervous system, a decoction of Manchu aralia was added to the marmalade recipe. The drug brand LLP "Zerde -Fito". Composition Carrageenan - gelatin stabilizer is plasticity and viscosity jelly mass. To reduce the hot decoctions of herbs additionally bears a cranberry and sea buckthorn. Cranberries are very useful, rich in vitamins and antioxidants, which "cleanse" our body, slow the aging of cells and have a beneficial effect on the urinary and circulatory system. Fruits and berries provide the body with vitamins, minerals, food fibers, polyphenolic compounds and other essential nutrients, Active activity of the secretory apparatus of the stomach and pancreas, strengthen the separation of digestive juices and increase their enzymatic, digestive activity, lowering dissolved putrefaction in the intestine, create a favorable environment for the normalization of nervous excitability. A large number of antioxidants is in the extracts, decoctions, infusions. The presence in the extracts of natural preservatives - carboxylic and hydroxycarboxylic acids, flavonoids, vitamins, essential oils, anthocyanins, - improves the biological resistance of products. Products with biologically active additives, in particular, confectionery products are presented in a fairly narrow range, which does not always satisfy the constantly growing consumer demand. The development of a new technology for the production of jelly masses enriched with decoctions of medicinal herbs and berries promotes the promotion of new types of products enriched with nutrients for the prevention of a number of diseases.

In addition to innovative developments in the field of bakery and confectionery production, our laboratory is actively conducting research on improving the technology of preparing sour-milk products.

Project "Technology of preparation of ethnic fermented milk products in dairy production". The aim of the project is to develop a technology for ethnic new-generation sour-milk products using plant components to enhance the food, biological, and physiological value of finished products. In this aspect, a certain interest is of flax seeds and greenery of cilantro. Scientists have confirmed that the use of fermented milk products allows us to talk about their incredible properties for the human body. Most types of fermented milk products are often used for therapeutic and preventive purposes. Modern manufacturers of products offer a wide range, so consumers can always choose a product, given their taste preferences. However, on the shelves of shops you will never find the long-forgotten names: koirtpak, irkit, eugene, touriyaz and others.

Kazakh cuisine is represented by a fairly wide range of ethnic fermented milk products, but recipes for their preparation are known only in the outback. So in the laboratory the recipe for preparing a koortpack based on a decoction of flax was developed. The choice fell not accidentally. Decoctions of flaxseed produce a facilitating effect with intestinal obstruction, muscular dystrophy and myopathy. In folk medicine, flax is used for dry cough, as well as for diseases of the respiratory system. In its composition, flax seeds contain lignans - phenolic compounds, which are plant hormones. They contribute to the purification and protection of vessels from atherosclerosis and various injuries, which are the main causes of cardiovascular diseases.

Lignans detoxify special enzymes, synthesized in the liver as a result of food poisoning. Also flax seeds contain in their composition a valuable acid - fatty alpha-linolenic acid omega-3 - is a kind of "accelerator" of synthesis of substances that reduces the possibility of disease of cardiovascular diseases. In addition, linolenic acid helps in the treatment of arthritis, skin diseases, reduces the inflammatory processes of the body. Enrichment of the sour milk beverage koortpak with flax seeds was made in the form of a decoction. One of the goals of the study was to substantiate the selection and use of plant components for the production of ethnic fermented milk products, to develop recipes for co-paddle and blackberry, indicating the technological parameters and production regimes, determining the nutritional value and chemical composition of enriched beverages.

One of the latest studies "The technology of vegetable juices using spirulina." One of these additives is a unique plant product - spirulina. Spirulina consists of almost 70% of the protein - it is much more than in other natural foods. Its protein is perfect - and this means that it contains all the necessary amino acids. Most animal proteins are saturated with fat, accompanied by a large number of calories and cholesterol. Spirulina contains only 5% fat and a gram accounts for less than 4 calories, and also practically does not contain cholesterol. The protein spirulina is easily digested and absorbed.

Research aimed at solving an important nutrition problem, with the creation of qualitatively new functional food products for prophylactic purposes, enriched with supplements of super-grain crops, are relevant and of socio-economic importance.

3.3 Training of Land Management specialists at KazNAU

The training of Land Management specialists at Kazakh National Agrarian University conducts at the Department of Land Resources and Cadaster on three levels: Bachelor, Master, PhD.

Main areas of the training are Rational Use and Protection of Lands, Land cadaster, Land valuation and real estate evaluation, Land use planning, Legal regulation of land, Geodetic works at land planning.

The Department has the following main study courses:

- Land planning and land management,
- Land management and land administration,
- Complex territorial cadasters of natural resources,
- Methodology of scientific research,
- Remote sensing of land resources,
- Development of land market in Kazakhstan,
- Modern problems of land cadaster,

- State registration and accounting of lands,
- Land cadaster,
- Management of land survey and cadastral works,
- Cadastral zoning, assessment and taxation,
- State control of use and protection of lands,
- Scientific basis of land management,
- Economic and legal mechanism of rational use and protection of land,
- Development of land market in Kazakhstan.

4 RATINGS

The Environmental Performance Index 2016 (EPI) is conducting research to determine the level of environmental efficiency of 180 countries conducted under the auspices of the World Economic Forum. The index is based on 20 indicators, which are grouped into several categories: air and water purity, the state of agriculture and forestry, biological diversity, climate, public health.

For the study, analysts used information obtained from government organizations and academic communities. As noted in the report, over the past year the environmental situation in the world has improved.

Kazakhstan ranked 69th in the rating (2016), overtaking the Dominican Republic (70th), Kyrgyzstan (71st) and Tajikistan (72nd).

Environmental problems and their solution Global warming concerns everything and everything, and Kazakhstan can not stay away from the world problem. In today's world, countries with different levels of development coexist - from states that are very backward with the traditional agrarian economy to powerful industrial powers, possessing all the achievements of science and technology. Kazakhstan is among the developing countries, while the strategic plan "Kazakhstan-2050" provides for entry into the list of 30 most developed countries.

Programs aimed at addressing the challenges of improving the environmental situation in the country should be covered, and information on current environmental changes in the regions should be accessible to all segments of the population through modern information sources.

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