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Satbayev University

ХАБАРЛАРЫ

ИЗВЕСТИЯ

НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК
РЕСПУБЛИКИ КАЗАХСТАН
Satbayev University

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NATURAL RESOURCE POTENTIAL OF KAZAKHSTAN AND CENTRAL ASIAN COUNTRIES: PROSPECTS OF USE

Abstract. In this paper, the main issues of developing a comprehensive program for the development of the natural resource potential of the Central Asian countries are considered. The authors have assessed the natural resource potential and mineral resource base for the countries under consideration. It is revealed that for cost-effective and environmentally safe nature and resource management, it is necessary to develop an integrated approach for the joint development and exploitation of resources available across countries.

It is noted that the development of the national economies of the studied countries is based on the wide use and export of mineral raw materials, water and energy resources. The export-oriented development of the Central Asian countries causes an increase in environmental pressure on the components of the environment. To preserve the sustainability of ecosystems and the quality of life, it is necessary to improve and create new institutions for inter-country cooperation.

It is revealed that when developing national strategies for the development of the Central Asian region, the countries do not consider the issues of integration and the coordinated use of their potentials. In this regard, it is necessary to study the possibilities of establishing and expanding cooperation with neighboring countries in the region at the state level. Moreover, special importance should be given to economic, financial, and environmental issues in the context of regional and inter-country cooperation. The main directions of the development of an integrated approach to the development of the natural resource potential of the Central Asian countries are presented. This is important for building systems of adaptation to dynamically changing natural and climatic conditions, modern global challenges and transformations, increasing the stability of natural eco-formations, as well as improving the national security of the Central Asian countries as a whole.

Key words: natural resource potential, mineral resources, Central Asia, regional cooperation, integrated approach, environmental safety.

Introduction. The development of the national economies of the Central Asian countries (CA) is based on the natural resource potential, which forms the basis of economic well-being based on the use of mineral raw materials. The resources of the DSA reach 3 billion tons of oil, 7 trillion. m3 of gas, 40 billion tons of coal, 685 thousand tons of uranium, etc. The region's economy is mainly focused on the export of raw materials. The region has an extensive network of roads and railways, as well as a system of pipelines [1]. The Central Asian region has sufficient potential for dynamic growth in the medium and long term. By 2030, the population of the Central Asian countries will increase from 70 to 85-86 million people, the GDP of the countries of the region will increase from $ 220 billion to $ 370-380 billion. Total investments for this period amounted to about $ 250 billion [2] and have the following orientation in industry, modernization of transport, telecommunications, engineering and utility infrastructure, such as:

- Kazakhstan-approximately $ 28 billion has been allocated for the implementation of the Nurly Zhol industrial and infrastructure development program;

- Turkmenistan-out of $ 68 billion for the implementation of the goals of the Development Strategy of Turkmenistan, $ 40 billion is allocated for industrial development, the development of hydrocarbon raw materials;

- Tajikistan - as part of the implementation of the National Development Strategy-2030, out of the estimated

118 billion dollars, more than half of the state and almost all of the expected private investments will go to the implementation of industrial development projects and the construction of infrastructure, hydropower;

- Uzbekistan-the main part of foreign investments is directed to the spheres of energy and natural resources, industrial development, the automotive industry, aircraft construction, etc.;

- Kyrgyzstan-the main part of foreign investments is directed to hydropower, agriculture, and light industry.

The export-oriented development of countries increases the burden on the ecosystems of the region. This actualizes the need to improve existing and form new institutions of inter-country cooperation in order to preserve the sustainability of ecosystems.

Materials and methods. A characteristic feature of the national development strategies of Central Asia is that practically none of the countries is focused on combining and using their potentials. The strategies and program documents of the countries note the need to establish and expand cooperation with neighboring countries in the region, but at the same time, in our opinion, economically, financially and environmentally sound programs of regional and inter-country cooperation are not sufficiently developed. Despite the well-known cooperation platforms of the former USSR countries (CIS, EURASEC, CSTO, EEMA, SCO, WTO) and the concluded agreements in the foreign policy sphere, there are contradictions based on economic, cross-border, environmental, etc. issues that can be resolved in the implementation of the following areas:

- the problem of the revival of the Aral Sea;

- development of cooperation in the field of biological safety;

- cooperation between specialized institutes for the purpose of conducting research on the use of subsurface resources (geological exploration, mapping, reserves assessment, field development, land reclamation, etc.), etc.;

- comprehensive regional economic and environmental cooperation;

- creation of a single ecological and economic space;

- coordination of policies in the field of cross-border natural and resource management and environmental protection, etc.;

- ensuring the stability and protection of countries from external negative impacts, etc.

The Central Asian countries are entering a new stage of development and more fully using the potential of each country and their comparative advantages. This should be the starting point for using the region-wide potential. International cooperation in Central Asia in the field of environmental management and environmental safety is based on the following main international legal documents:

- “On cooperation in the field of ecology and environmental protection”,

- “On cooperation in the field of prevention and elimination of consequences of natural and technical emergencies”,

- “On information cooperation in the field of ecology and environmental protection”

- “Agreement on cross-border cooperation in the field of exploration, development and protection of mineral resources”

- The interstate target program “Recultivation of the territories of States affected by uranium mining industries”, developed to solve problems related to the radioecological consequences of the exploitation of uranium tailings in Kazakhstan, Kyrgyzstan, Tajikistan, etc.

Taking into account the geographical location of the region, the transit factor, and the development opportunities for the future, Central Asia is the object of competition among the leading actors of the world (China, Russia and the United States), although, according to some experts, the region does not have a significant natural resource potential in the global context [3,4]. In these conditions, the issues of rational and careful use of natural resources in general and transboundary resources in particular, as well as environmental safety, are particularly acute in the region.

The state development programs of the Central Asian countries are focused on the harmonization of interaction between society and the environment, the creation of environmentally safe, pleasant habitats. The scientific substantiation of the prerequisites and factors for the effective development of natural resources and the sustainable development of national economies while maintaining the parameters of the quality of life and the environment assumes [5]:

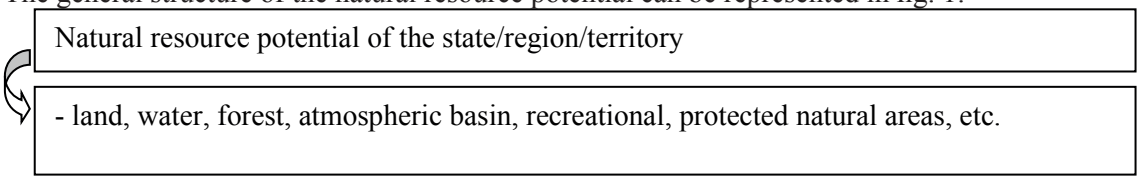
- formation of a mechanism for the integrated development of resource and raw material potential;

- creation of organizational and economic bases of natural and resource management;

- improvement of the mechanism for managing the processes of potential development;

- management of the resource potential of countries (integrated development, reproduction and increase of mineral reserves).

The general structure of the natural resource potential can be represented in fig. 1:



Developed by the authors.

Fig. 1- Composition and structure of the natural resource potential of the Republic of Kazakhstan

In the process of using the potential of the territory, it is legitimate to distinguish:

- primary resources (the initial resource potential of the territory);
- waste from the development and operation of raw materials sources;
- historical waste (secondary, man-made resources);
- worked-out voids, mining workings and waste spaces, etc.

According to experts, the total value of the explored and estimated mineral raw materials of the Republic of Kazakhstan is about 11 trillion US dollars. Kazakhstan is one of the richest countries in the world in terms of the range and volume of mineral resources, but the efficiency of the resource-raw materials economy lags far behind the level of the industrialized countries of the world. Central Asia has a quarter of the world's uranium reserves, and the main part of uranium (more than 650 thousand tons) is in Kazakhstan, which is one of the three countries with the largest resources of uranium ores. By the beginning of 2020 more than 493 deposits are known in the Republic of Kazakhstan, which contain 1,225 types of mineral raw materials. 99 of the Mendeleev system were identified in the bowels of the Republic of Kazakhstan, 70 reserves were explored, more than 60 elements were involved in the production.

Assessment of the resource potential of Kazakhstan and the Central Asian region. The total land area in Kazakhstan is 2724.9 thousand km2. In most regions of the country, there is a catastrophic environmental situation caused by climate change and the ozone layer, the reduction of biodiversity, desertification, pollution of water resources, air, and the accumulation of production and consumption waste. According to experts, every 10 years in Kazakhstan there is an increase in the average annual temperature by 0.26°C, while by 2085 it is possible to shift the humidification zones, and all the northern regions of Kazakhstan may end up in a semi-arid zone, and the arid zone will occupy a more extensive zone. According to the World Meteorological Organization, the destruction of the ozone layer over the past 25 years has amounted to 10%. Over Kazakhstan, the thickness of the ozone layer has decreased by 5-7%.

Most of Kazakhstan is located in the arid zone, about 66% of the territory is subject to desertification processes, which cause the widespread distribution of sand - up to 30 million hectares and saline lands - 127 million hectares. According to experts, 180 million hectares (60%) of land have turned into a desert. Due to desertification, almost half of pastures have been lost, 75% of irrigated lands are saline. More than a quarter of the territory of the Republic of Kazakhstan is uninhabitable due to tests at military training grounds. In general, there is a steady trend towards deterioration of land quality in the country: a decrease in the content of humus, biogenic elements, the species composition of vegetation, biological productivity. The total economic losses in Kazakhstan from land degradation is over 93 billion tenge.

The soil and ecological condition of the territory of Kazakhstan is assessed as extremely unsatisfactory, which requires the development of a program for the rational use, protection and restoration of disturbed soils, measures to prevent soil degradation, restore the fertility of eroded and disturbed soils, pastures and grounds.

One of the important problems is the contamination of the soil cover. According to the land balance data, as of 1.11.2017, 245.4 thousand hectares of land are listed in the Republic of Kazakhstan, which were disturbed due to mining developments. The general picture of pollution by region is presented as follows:

Region	The situation in the region
East Kazakhstan Region	the lands are polluted with compounds of copper, zinc, cadmium, lead, and arsenic. Toxic waste is placed in landfills that do not meet sanitary and environmental requirements. Lead anomalies cover the territory of the Shemonaikhinsky, Glubokovsky and Zyryanovsky districts. The most disadvantaged is the area in the triangle between the cities of Ust-Kamenogorsk, Ridder, Zyryanovsk. Radioactive contamination for 40 years. 300 km2 of land is dangerous for all living things

Pavlodar	The sources of pollution are enterprises of mechanical engineering, chemical, coal mining and oil refining industries, Ekibastuz GRES. As a result of the constant increase in the volume of accumulated waste due to the unsettled places of their storage and disposal, the migration of pollutants into the environment occurs
Karaganda	land pollution is associated with waste from the mining and metallurgical industries. There are more than 350 landfills for storing industrial and household waste in the region. Excessive emissions of the Balkhash Mining and Metallurgical Combine led to soil contamination with copper, zinc, cobalt, cadmium and lead
Atyrau	technogenic pollution in the form of oil spills with a volume of tens of thousands of tons has been allowed on more than 1.3 million hectares of land; soil contamination in some areas penetrates up to 10 m, vegetation has been destroyed. More than 12 million tons of sulfur have been accumulated in the dumps of the Tengiz field.
Kyzylorda	the sources of pollution are oil and gas production enterprises that cause land pollution with heavy metals and petroleum products. In addition to oil production, the main industries that cause land pollution are the extraction of non-ferrous metals and natural radioactive ores
Kostanay	Technogenically polluted lands are common in industrial zones of cities, in areas of mining and processing of minerals. The issue of environmental pollution by the ash dumps of the Troitskaya GRES and the tailings dumps of the Sokolovsko–Sarbaysky mining and processing plant is acute in the region
North Kazakhstan region and etc.	the development of gold-bearing and polymetallic deposits causes land contamination with arsenic and heavy metals. Disposal, neutralization, disposal, and cross-border transportation of waste is one of the most urgent problems in the country. Toxic waste is stored and stored in storage facilities often without compliance with the relevant environmental standards and requirements. As a result, the soil, underground and surface waters of many regions are subject to intense pollution
Conclusion: 1.The deterioration of the ecological state of the soil, the development of water and wind erosion, a decrease in the fertility of lands and soils is characteristic. According to the report of the United Nations Development Program "Strategic measures to combat desertification in the Republic of Kazakhstan until 2025", the total annual economic losses due to land degradation in Kazakhstan are estimated at 93 billion tenge. 2. The annual losses associated with land degradation and irrational land use in Central Asia amount to more than $ 6 billion. 3. Land pollution is largely influenced by the fact that the flow of the main rivers in Kazakhstan is formed on the territories of neighboring states, so the water quality is formed under the influence of pollutants coming together with water from these states	

The main sources that cause the degradation of natural ecosystems are industry, agriculture, road transport, etc. anthropo-and technogenic factors. According to experts, more than 75% of the territory of the Republic of Kazakhstan is exposed to an increased risk of environmental destabilization.

About 5 million people in the Republic of Kazakhstan live in a polluted air basin, 2 million-in conditions of an extremely high level of pollution (in particular, in Almaty). The annual volume of atmospheric pollution in Kazakhstan ranges from 3 million tons. The negative effect on the health of the population of Kazakhstan from atmospheric air pollution is about 1.9 billion tenge/year.

Currently, only 3-4 main components are extracted during the development of mineral deposits, i.e. about 3-5% of the volume of extracted raw materials, the rest is sent to waste. According to the Ministry of Investment and Development of the Republic of Kazakhstan, more than 28 billion rubles have been accumulated in the country. tons of production and consumption waste, of which more than 18 billion. tons of technogenic mineral formations and about 8 billion tons. tons of hazardous toxic waste, while about 15% of the generated waste is disposed of, whereas in developed countries more than 30%. The volumes of waste from the production of non-ferrous, rare, precious and radioactive metals are comparable to the reserves of some large deposits.

According to the specific indicator of greenhouse gas emissions per unit of GDP (3.38 kg/USD), carbon dioxide ranks 1st in the Central Asian states. The largest contribution to the volume of CO2 emissions is made

by energy, and coal is one of the energy carriers. According to forecast data, the share of coal will increase and by 2020 will amount to 66% of the total emissions generated from fuel combustion. 50% is emitted by thermal power plants, 33% - by mining and non-ferrous metallurgy enterprises.

The volume of municipal solid waste (MSW) increases annually by about 10-13 million m3. The bulk of MSW without separation into components is exported and stored in open landfills, 97% of which do not meet the requirements of environmental legislation, their placement and arrangement was carried out without projects and environmental impact assessment. No more than 5% of solid waste is subjected to recycling/ incineration.

The water resources of Central Asia include 4 basins: the Caspian Sea, the Ob River, Lake Balkhash (these basins are located in the Republic of Kazakhstan) and the Aral Sea (extends across the territory of the Central Asian countries) [3]. The water resources of Central Asia are characterized by uneven distribution (they are mainly concentrated in Tajikistan and Kyrgyzstan, Turkmenistan and Uzbekistan have very poor water reserves), as well as many transboundary rivers (Amu Darya, Syr Darya, Chu, Talas, Ili, Tarim and Irtysh). Controversial issues on water resources are caused by the construction of large hydroelectric power plants on the tributaries of the Amu Darya and Syr Darya. According to the UN, due to uncoordinated decisions on the coordination of water problems, Central Asia loses at least $ 1.75 billion/year [6,7].

In Kazakhstan, the water quality is deteriorating due to industrial and domestic wastewater. In irrigated agriculture, water overspending is observed by 1.5-2 times. The average annual flow of rivers in the Republic of Kazakhstan is relatively small and is only 101.9 km. Of this amount, about half of the river flow is formed on the territory of the Republic of Kazakhstan - 57% (58.4 km3). The remaining water resources (43.5 m3) come from (China, Uzbekistan, Kyrgyzstan). The surface water resources required for the country are estimated at only 46 km3. The limited water resources affect the forage base and the state of natural pastures. In the Central Asian countries, there are approximately 50-60 million hectares of land suitable for irrigation, while water resources are sufficient for irrigation only 8-10 million hectares.

A similar situation in terms of the use of natural resource potential is observed in other Central Asian countries [8,9]. Based on the analysis, the main tasks of developing the natural resource potential of the Central Asian countries are:

- modernization of basic industries through increasing resource efficiency;
- introduction of innovations to improve the competitiveness of the economies of the countries;
- stimulating demand in the domestic market;
- expansion of markets for the sale of non-primary goods;
- participation in global value chains;
- infrastructure development, etc.

In this regard, a new policy is needed for the Central Asian countries to overcome challenges and threats of a region-wide nature. The key issues of cooperation at a new stage of development and joint search for solutions should concern such issues as:

- assessment of global threats to the sustainable development of countries;
- assessment of the external environment and negative factors for the formation of program counteraction measures;
- provision of national, regional, environmental, biological, information, etc. types of security;
- ways to solve the joint use of the natural resource potential of the countries;
- development of mechanisms for coordinated interaction of countries in the field of natural and resource management, environmental protection, etc.

The main problem points of environmental challenges include:

1. Climate change (droughts and high temperatures, floods, earthquakes, avalanches, mudslides [10].
2. Problems of water use.
3. Problems of land use, land degradation.
4. Development of scientific and information research centers for coordination on issues of resource and environmental management and sustainable development, etc.

Results. All this together makes it necessary to combine the efforts of the Central Asian countries to develop and implement a unified environmental regional policy, taking into account the creation of a supranational structure for coordinating environmental programs, forming a common system of environmental safety in Central Asia.

Based on this, the rational use of the natural resource potential of the Central Asian countries is possible if there is a coordinated natural resource strategy based on the development of a new organizational and

economic mechanism for joint integrated resource development. An important condition for this is the interdependence of countries in the use of all types of resources, joint provision of environmental safety and mutually beneficial efficiency of their use. The successful development of interregional infrastructure and the liberalization of regional trade depend on the effective management of territorial resources. In terms of the development of a commercial and industrial cluster, a good example is the CASA 1000 project worth $ 1 billion, the implementation of which will contribute to the integration and expansion of markets in the interests of trade development, as well as help find sustainable solutions in the field of water resources management. According to this project, the development of the natural and energy potential of the Central Asian countries is beneficial not only for themselves, but also for advanced developing countries-neighbors in the region [11]. The formation of common economic and energy spaces for the Central Asian countries and, by and large, the creation of an international energy infrastructure is an effective vector for building a Eurasian energy and resource development model [12].

The strategic programs of socio-economic development of the Central Asian countries should take into account the global challenges of our time, namely:

- threats to national and regional security;
- reducing the risks caused by COVID-19 and other viral and infectious diseases;
- shortage of drinking water;
- threat to food security;
- exhaustion of natural resources;
- deterioration of the quality of the natural environment.

Conclusion. The solution of these problems determines the need for systemic transformations in the field of rational use of natural resource potential. The main principles of sustainable development of the Central Asian countries can be summarized as follows:

- efficiency (minimizing environmental impact);
- resource conservation (conservation of natural resources);
- coherence and coordination of actions of the Central Asian countries;
- intersectorality (interaction of political, economic, environmental, social, etc. institutions).

All this together correlates with the principles of increasing the productivity of natural resources, minimizing the burden on the environment, using alternative energy sources, and developing environmental safety mechanisms. Based on the above, we have developed the main structural transformations in order to preserve the natural architectures of ecosystems in the conditions of the region. These transformations take into account the resource-extracting orientation of national economies and the main vectors of improving the environment, ensuring the quality of life. According to the main directions of the region-wide socio-ecological-economic model of the development of the Central Asian countries, we have proposed a scheme of integrated cooperation of states, the conceptual foundations of which can be represented as:

1) development of new approaches to solving socio-ecological and economic problems at the country, regional and international levels, taking into account the expansion and deepening of the processes of globalization;

2) development and improvement of institutions to solve these problems;

3) formation of organizational mechanisms for creating favorable trends in the development of foreign policies of countries based on the current situation in the Central Asian region;

4) development of proactive forecasts for the development of national economies and scenarios in each country in the context of integration and global challenges of our time.

By and large, a comprehensive approach is needed to develop interstate and regional adaptation systems to dynamically changing natural and climatic conditions, global transformations aimed at reducing the vulnerability of natural and social systems, and improving the national security of Central Asian countries. This is important and necessary for achieving the Sustainable Development Goals on the basis of coordinated joint actions and equal partnership relations between the Central Asian countries.

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ҚАЗАҚСТАН МЕН ОРТАЛЫҚ АЗИЯ ЕЛДЕРІНІҢ ТАБИҒИ-РЕСУРСТЫҚ ӘЛЕУЕТІ: ПАЙДАЛАНУ ПЕРСПЕКТИВАЛАРЫ

Аннотация. Бұл мақалада Орталық Азия елдерінің табиғи-ресурстық әлеуетін дамыту-дың кешенді бағдарламасын әзірлеудің негізгі мәселелері қарастырылады. Авторлар аталмыш елдердің табиғи-ресурстық әлеуетін және минералдық-шикізат базасын бағалай отырып, экономикалық тиімді және экологиялық қауіпсіз табиғат пайдалану мен ресур-старды басқару үшін әртүрлі елдерде бар ресурстарды бірлесіп игеру мен пайдаланудың кешенді тәсілін әзірлеу қажеттігі анықтауға тырысты.

Зерттелетін елдердің ұлттық экономикаларының дамуы минералды шикізатты, су және энергетикалық ресурстарды кеңінен пайдалану мен экспорттауға негізделген. Орталық Азия елдерінің экспортқа бағдарланған дамуы қоршаған орта құрауыштарына экологиялық жүктеменің ұлғаюын туындатады. Экожүйелердің орнықтылығы мен өмір сүру сапасын сақтау үшін еларалық ынтымақтастық үшін жаңа институттарды жетілдіру және құру қажет.

Елдің Орталық Азия өңірін дамытудың ұлттық стратегияларын әзірлеу кезінде Интеграция және өз әлеуетін Үйлестірілген пайдалану мәселелері ескерілмейтіні анықталды. Осыған байланысты өңірдің көрші елдерімен ынтымақтастықты мемлекеттік деңгейде орнату және кеңейту мүмкіндіктерін зерделеу қажет. Бұдан басқа, өңірлік және еларалық ынты-мақтастық тұрғысынан экономикалық, қаржылық және экологиялық мәселелерге ерекше мән берген жөн. Орталық Азия елдерінің табиғи-ресурстық әлеуетін дамытуға кешенді тәсілді әзірлеудің негізгі бағыттары ұсынылған. Бұл өте құбылмалы табиғи-климаттық жағдайларға, қазіргі жаһандық сын-тегеуріндер мен трансформацияларға бейімделу жүйесін құру, табиғи экожүйелердің орнықтылығын арттыру, сондай-ақ жалпы Орталық Азия елдерінің ұлттық қауіпсіздігін арттыру үшін маңызды.

Түйінді сөздер: табиғи-ресурстық әлеует, минералдық ресурстар, Орталық Азия, өңірлік ынтымақтастық, кешенді тәсіл, экологиялық қауіпсіздік.

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ПРИРОДНО-РЕСУРСНЫЙ ПОТЕНЦИАЛ КАЗАХСТАНА И СТРАН ЦЕНТРАЛЬНОЙ АЗИИ: ПЕРСПЕКТИВЫ ИСПОЛЬЗОВАНИЯ

Аннотация. В данной статье рассматриваются основные вопросы разработки комплексной программы развития природно-ресурсного потенциала стран Центральной Азии. Авторы оценили природно-ресурсный потенциал и минерально-сырьевую базу рассматриваемых стран. Выявлено, что для экономически эффективного и экологически безопасного природопользования и управления ресурсами необходимо разработать комплексный подход к совместному освоению и использованию ресурсов, имеющихся в разных странах.

Отмечается, что развитие национальных экономик исследуемых стран основано на широком использовании и экспорте минерального сырья, водных и энергетических ресурсов. Экспортно-ориентированное развитие стран Центральной Азии вызывает увеличение экологической нагрузки на компоненты окружающей среды. Для сохранения устойчивости экосистем и качества жизни необходимо совершенствовать и создавать новые институты для межстранового сотрудничества.

Выявлено, что при разработке национальных стратегий развития Центральноазиатского региона страны не учитывают вопросы интеграции и скоординированного использования своего потенциала. В связи с этим необходимо изучить возможности установления и расширения сотрудничества с соседними странами региона на государственном уровне. Кроме того, особое значение следует уделять экономическим, финансовым и экологическим вопросам в контексте регионального и межстранового сотрудничества. Представлены основные направления разработки комплексного подхода к развитию

природно - ресурсного потенциала стран Центральной Азии. Это важно для построения систем адаптации к динамично меняющимся природно-климатическим условиям, современным глобальным вызовам и трансформациям, повышения устойчивости природных экосистем, а также повышения национальной безопасности стран Центральной Азии в целом.

Ключевые слова: природно-ресурсный потенциал, минеральные ресурсы, Центральная Азия, региональное сотрудничество, комплексный подход, экологическая безопасность.

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REFERENCES

1. Frolova I.Y. Central Asia in China's energy strategy / Central Asia: problems and prospects (a view from Russia and China): Collection of articles: Russian Institute for Strategic Studies; Chinese Academy of Modern International Relations / / Moscow, RISI. - 2013. - pp. 125-141.
2. The foreign policy of the Central Asian countries and new global transformations. Analytical research / Duisen G.M., Aitzhanova D.A., Jalilov Z.G.-Almaty: Institute of Oriental Studies named after R. B. Suleimenov, 2020. - 92 p.
3. Dm. Solovyov. Central Asia: the geopolitics of water and energy. OIVT RAS, IO RAS https://energypolicy.ru/czentralnaya-aziya-geopolitika-vody-i-energii/energetika/2021/11/01/.
4. Ziyadullaev N., Ziyadullaev U. On the development strategy of the Central Asian States in the context of globalization and regionalization of the world economy / / Society and Economics, 2019, No. 4. - pp. 87-100.
5. Strategy-2050, the Concept of transition to sustainable development for 2007-2024, the message of the President of the Republic of Kazakhstan to the people of Kazakhstan "Increasing the welfare of Kazakhstanis: increasing income and quality of life from October 5, 2018; The concept of the transition of the Republic of Kazakhstan to a "green economy". Decree of the President of the Republic of Kazakhstan dated May 30, 2013 No. 577. - Astana, 2013.
6. Borishpolets K.P. Water and energy problems of Central Asia and comparative opportunities of the EURASEC and the SCO in solving them // Bulletin of MGIMO University. - 2011. - № 2. – C. 31-37.
7. Petelin E. China's Energy Monologist in Central Asia // Security Index, 2011, No. 4 (99), Vol. 17. - C. 35-57; Towards strengthening cooperation on the rational and efficient use of water and energy resources in Central Asia. UNESCAP. New York, 2004. - 123 p.
8. Environmental challenges in Central Asia: the current state, the search for new solutions. Collection of materials of the Round Table. - Tashkent: Center for Research Initiatives "Ma'no", Friedrich Ebert Stiftung, 2019 – 165 p.
9. Environmental aspects of the Belt and Road projects in Central Asia. Review. OF "Socio-Ecological Fund". - Almaty, 2020. - 71 p.
10. Analysis of climate change adaptation activities in Central Asia. Needs. recommendations. Practices. REC CA. - Almaty, 2011. - 157 p.; Semenova N. K. International and political dimensions of Russian-Chinese interaction in the energy sphere of Central Asia. - Autoref. diss. ... Ph. D. - M., 2017. - 24 p.
11. http://www.casa 1000.org/ru/home-russkij/; Sasaki D., Nakayama M.A study on the risk management of the CASA-1000 project / / Hydrological Research Letters. - 2015. - № 4(9). - Pp. 90-96.
12. Central Asian Program for the Development of Energy and Water Resources [Electronic resource]. 2017. URL: http://www.vsemirnyjbank.org/ru/region/eca/brief/caewdp (accessed: 21.08.2017); Relations of Central Asia with global economic centers. A study by the Asian Development Bank Institute. Asian Development Bank Institute. - Tokyo. - 2015 – 124 p.

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