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## **THE MAIN DIRECTIONS OF ENSURING THE ENVIRONMENTAL SAFETY OF WATER BODIES IN TRANSBOUNDARY BASINS**

**Abstract.** The article is devoted to the analysis of priority areas of international cooperation in the field of ensuring environmental safety of transboundary water bodies. The authors of the article indicated such areas of environmental safety as: Water-energy problem of the Central Asian countries; impact of climate change on water; Aral ecological crisis and its consequences for the natural environment of the Central Asian region. The authors of the article made recommendations on eliminating the environmental problems of transboundary water bodies. It is proposed to sign fundamental documents on legal issues of water allocation and protection of transboundary rivers on the basis of international law and bring the problem of transboundary rivers to the level of the SCO and tripartite negotiations (Russia, Kazakhstan, China). The necessity of building joint hydropower facilities on transboundary rivers is substantiated. The authors propose to expand, improve and modernize the control network (gauging stations, etc.) in all river basins of Kazakhstan and China.

**Key words:** water management, water security, transboundary water bodies, shared water use, environmental safety.

**Introduction.** In the modern world, in the context of globalization, the Central Asian region is faced with a number of environmental problems, which in essence can be called environmental disasters of enormous proportions, or with threats of their occurrence. In this case, the centers of disturbance of the natural ecosystem are in a state close to crisis. Anthropogenic environmental factors lead to its large-scale degradation. The situation is aggravated by the fact that the geography of zones of environmental threats covers a vast territory, including neighboring states. Particularly problematic in terms of environmental hazard include the mountains of the Tien Shan, the Caspian Sea, the Aral basin, the Semipalatinsk nuclear test site, the Baikonur cosmodrome, the Irtysh, etc.

According to the Convention, paragraph 1 of Article 1, the term “transboundary waters” means any surface or groundwater that denotes, crosses or lies between two or more States. In cases where transboundary rivers flow directly into the sea, such transboundary rivers fall under the provisions of the Convention to a straight line crossing their mouth between points located on the low-water line on their banks [1].

**Main part.** Water remains a key natural component of human existence and ecosystem integrity. In this regard, the rational use of water resources remains a problem that is acquiring enormous proportions [2].

The study of the main directions of ensuring the environmental safety of water bodies in transboundary basins allowed us to identify the following priority areas.

1. Water-energy problem of the Central Asian countries. The water and energy problem of the countries of the Central Asian region, which includes such countries as the Republic of Kazakhstan, the

Kyrgyz Republic, Turkmenistan, the Republic of Uzbekistan, and the Republic of Tajikistan, has already become one of the problems that negatively affects the environmental safety of the region. A lot of research by scientists from different branches of science is devoted to this problem. At the international level, this problem was also considered and certain steps were taken to solve it. In particular, in September 2000, UN member states adopted eight Millennium Development Goals, which expired on December 31, 2015. The states of the Central Asian region have concluded a number of agreements aimed at the uniform distribution of surface water resources between the countries of the Central Asian region and their rational use. However, as practice shows, at present there is an irrational use of water-energy facilities and water resources in general.

According to some scientists, “in this regard, the sixth goal of sustainable development “Ensuring the availability and rational use of water resources and sanitation for all” covers not only the problems of drinking water, sanitation and hygiene, but also the issues of rational use of water resources around the world. For the implementation of SDG 6, the task of ensuring integrated management of the hydrological cycle at all levels will be of no small importance. What in practice will be monitored by the global indicator “the degree of implementation of integrated water resources management on a scale from “ 0 ”to“ 100 ”, taking into account the so-called “water stress”. “Water stress”, in turn, is defined as the ratio of the total volume of fresh water used by the main sectors of the economy of a country or region to the total amount of renewable fresh water resources. According to UN estimates, today, “water stress” negatively affects the quality of life of more than 2 billion people on the planet, and, unfortunately, forecasts for the growth of these statistics are not encouraging [3].

It should be noted that international experts put the Central Asian region along with the countries of the Arabian Peninsula and North Africa. In the latter, the indicator of the use of freshwater resources from renewable sources exceeds the threshold level. This is alarming and should orient the governments of the countries of the Central Asian region to pay attention to solving the water and energy problem in the near future.

In our opinion, the primary tasks of the states of the Central Asian region to solve the water and energy problem should be:

- stimulating the conservation of water and energy resources;
- systemic protection of natural objects that affect the conservation of water basins;
- development of human potential, understanding the value and significance of the water and energy potential of the Central Asian region.

To solve given problems, the Central Asian states need to coordinate national sectoral strategies at the level of state policy and, possibly, develop a unified strategy for solving the water and energy problems of the Central Asian region, as well as develop medium-term financial programs at the government level, including measuring systems to track progress in implementation of the tasks.

2. The impact of climate change on water. The next direction in ensuring the environmental safety of water bodies in transboundary basins is to minimize the negative effects of climate change on water resources.

Climate studies conducted by scientists from various fields of science have noted intense global warming. In particular, climate warming is also observed in the Central Asian region. Scientists note a trend towards warmer winters and arid summers in many parts of the region, which in turn provokes the retreat of glaciers and the melting of permafrost in the Pamir and Tien Shan mountains. Of course, climate change can affect the quantity and quality of water resources and their seasonal dynamics, agriculture and human health. In addition, climate change can exacerbate existing problems, such as, for example, desertification and degradation of ecosystems and natural resources. For the countries of the Aral Sea basin, which are experiencing an ever-increasing shortage of water resources, the problems associated with climate change and water resources play a key role in economic development and meeting the vital needs of the future.

As noted in a study by Russian scientists, “Central Asia covers the territory of five countries - Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. It is located in the center of the Eurasian continent in a total area of 3,882,000 km<sup>2</sup> with a population of about 72 million people. It borders with Afghanistan and Iran in the south, with China in the east and with Russia in the west and north. The territory of Central Asia, with the exception of the highlands, has insufficient, and for the most part,

extremely insufficient moisture. The sparseness of the hydrographic network is associated with this. The density of the river network in the desert plains of Central Asia is about 2 m per 1 km<sup>2</sup>, while, for example, in the northern half of the Russian Plain, it reaches 300-350 m per 1 km<sup>2</sup>. Only in mountainous areas, starting from 700 m, the amount of precipitation increases markedly, respectively, and runoff also increases. Here, the density of the river network in some mountainous regions exceeds 600 m per 1 km<sup>2</sup>” [3, p.58].

As you know, the Central Asian region is characterized by low rainfall, aridity, sharp fluctuations in weather conditions and uneven distribution of resources, and, importantly, it is especially susceptible to the effects of climate change. The patterns of climate change were evaluated in the National Communications of the Central Asian region under the UN Framework Convention on Climate Change (UNFCCC), and also reflected in scientific publications, both by scientists of the Central Asian region and scientists around the world. The results of studies of climate change and temperature change in the Central Asian region show that climate warming has occurred in the whole region. This is also confirmed by data showing an increase in temperature in all five countries of the region (the Republic of Kazakhstan, the Kyrgyz Republic, Turkmenistan, the Republic of Uzbekistan, and the Republic of Tajikistan).

It is indisputable that global climate change will have serious consequences for all countries of the Central Asian region. In our opinion, despite the different level of economic development and territorial-climatic features, the countries of the Central Asian region have common environmental problems. We completely agree with Russian scientists, who designated them as follows:

- an increase in the deficit of existing water resources and deterioration in their quality, including accelerated melting of glaciers and a decrease in snow cover, changes in the hydrographic regime of surface waters, a decrease in the population’s access to high-quality drinking water, acceleration of the process of desertification, degradation and salinization of lands, loss of biodiversity, increase in deforestation, and also negative consequences for such key sectors of the national economy as agriculture and energy;

- the threat posed to irrigated agriculture, the predicted decrease in the yield of the used agricultural crops, the decrease in the productivity of pastures, the reduction in the forage base and, accordingly, the livestock sector, a change in the employment structure of the rural population, and the threat to food security of countries;

- the emergence of a source of tension between neighboring states in matters of coordination and regulation of the irrigation and energy regime of the region’s water resources, a negative impact on hydropower, which could pose a threat to the energy security of countries;

- increased risk of dangerous and extreme hydrometeorological phenomena, such as hail, drought, extremely high or low temperatures, etc., which will cause more frequent emergencies, including rainfall, mudflows, landslides, avalanches, floods and droughts;

- an increase in the danger to existing ecosystems and a threat to biodiversity, including displacement of climatic zones and changes in the habitat of flora and fauna, changes in land use and land cover;

- increased risks to public health, including heat stress, increased risk of the spread of infectious and parasitic diseases, which can lead to increased mortality [4, p.74-75].

### 3. Aral ecological crisis and its consequences for the natural environment of the Central Asian region.

The problem of drying out the Aral Sea is not new for the whole world. The Aral Sea, which belonged to Uzbekistan and Kazakhstan, was one of the largest continental water bodies in the world. Both the sea and the rivers flowing into it (Amu Darya and Syr Darya) had high environmental value. The rivers Amu Darya and Syr Darya and their tributaries cross the borders of 6 countries, one of which - Afghanistan has not yet begun the serious use of the waters of the Amu Darya due to the war. Kyrgyzstan, Kazakhstan, Tajikistan and Uzbekistan share among themselves the waters of the Syr Darya and its tributaries. Tajikistan, Turkmenistan and Uzbekistan share among themselves the waters of the Amu Darya and its tributaries. The tributaries of these two rivers are formed in the mountains of the Pamirs and Tien Shan. Irrational use of the Amu Darya and Syr Darya rivers has led to the drying up of the Aral Sea. The water level dropped by more than 20 meters, the coastline receded in places by 100 km. The former water area, 65,000 square meters km - equal to the territory of Holland and Belgium combined, decreased by 70% and continues to decrease.

Huge efforts have been made by the entire world community to solve it. The international community is attempting to coordinate the efforts of Central Asian countries to resolve the Aral Sea problem. A number of joint declarations were signed. The International Fund for Saving the Aral Sea was also created with an action program based on the following provisions:

- development of a common water strategy;
- creation of a monitoring system;
- increasing the efficiency of water use;
- fight against poverty and other consequences of the disaster.

However, at present this problem is still relevant and requires still intensified attention. According to the researchers, “The most acute transboundary environmental threat for Uzbekistan, Kazakhstan and the entire Central Asian region is the drying up of the Aral Sea. The Aral Sea crisis is the largest environmental and humanitarian disaster in the recent history of mankind. 35 million people living in the sea basin experience its consequences” [5].

According to researchers of the state of the Aral Sea, “Now the dried bottom of the Aral Sea extends to 28,000 square kilometers. Two thirds of this territory is occupied by salt marshes, saline sands. Each year, 75 million tons of sand and dust and 65 million tons of fine salts, which are carried by the winds and settle for thousands of kilometers, rise into the atmosphere from these spaces. The dried bottom of the Aral Sea is becoming one of the main sources of aerosols, pesticides and herbicides in the Earth’s atmosphere. The facts of the harmful effects of salts and aerosols from the bottom of the Aral Sea on public health, the environment, and even on the process of accelerated melting of the Tien Shan glaciers, from where the Syr Darya and Amudarya rivers originate, became public” [6].

The scale and complexity of the Aral Sea problem require an integrated, diversified approach, with the cooperation of all states in the region. Overcoming the problems associated with the Aral Sea crisis directly depends on the realization by all the states of Central Asia of the root causes of these problems, on how consistently they intensify their efforts to overcome the critical situation that requires adequate measures to be taken both at the regional and national levels. In our opinion, it is necessary for states to develop a Common Water Strategy for the countries of the Central Asian region.

Increased water intake from the transboundary rivers Ili and Irtysh. The problem of using water resources of transboundary rivers for China and Kazakhstan appeared in the last century. Back in the 70-80s, an agreement was reached with the PRC on the development of an interstate Agreement governing issues of joint use and protection of transboundary rivers. But due to a different understanding of this problem, such an Agreement was not signed. With Kazakhstan gaining independence, the issues of using water resources of transboundary rivers and especially the environmental problems of transboundary water resources became relevant for sovereign Kazakhstan.

The first time official negotiations on the use of transboundary rivers took place in 1998. But it should be noted that the parties went very hard to take this step. This problem became especially acute in the fall of 1998, when the authorities of the Xinjiang Uygur Autonomous Region (XUAR) of the PRC began accelerated construction. the Cherny Irtysh - Karamay canal, which is designed to divert part of the upper Irtysh waters to the Karamay oil field near Urumqi. As stated by the Chinese side, it intends to supply more than 450 million cubic meters of water from the Irtysh annually with the goal of supplying water to the district that is experiencing a constant shortage in it, and eventually increase this number to 1.5 billion cubic meters. It is also proposed that water be taken from the Ili River. Such a statement could not but alarm Kazakhstan. According to experts, the implementation of the PRC’s intentions will lead to a violation of the existing water supply regime and will hit industry and agriculture in the north-eastern and central regions of the Republic of Kazakhstan. But the most important thing is that the environmental situation in the zone of Balkhash and Zaysan lakes can greatly deteriorate, which is able to repeat the tragedy of the Aral Sea here.

An analysis of the available information contained in the official publications of the People’s Republic of China on water management issues allows us to draw a number of conclusions.

Thus, with a large number of border rivers with origins on its territory, China gains significant advantages in relations with neighbouring States (Kazakhstan, Russia, India, Nepal, Bhutan, Burma, Laos, Vietnam) and deliberately does not conclude agreements with many neighbors on the joint use and

protection of international waters. The Chinese side is very carefully studying all aspects of the use of water resources for a very long period of time, taking into account demographic factors and the possibility of full development of water resources on its territory. To this end, the People's Republic of China has a network of research and design organizations of the Ministry of Water Resources system, the volume of financing is sharply increasing due to the expansion of the range of works on water resources assessment, the growth of water construction, the construction of new irrigated lands.

Concerning transboundary rivers, China avoided accepting any obligation to comply with international rules. In official sources, the term "transboundary waters" or "international watercourses" is not mentioned, indicating the unilateral position of the People's Republic of China on the use or prevention of pollution of transboundary rivers. In institutional terms, all this is supported by the sustainable position of the Ministry of Water Resources of the People's Republic of China, which is defined by the State Body for Water Resources Management and has high powers to implement a unified water policy [7].

China's position on transboundary rivers is determined primarily by plans to transform Xinjiang into a regional and trade center in Central Asia with a further spread of influence in the Middle East.

In addition, China has plans to populate Xinjiang with ethnic Chinese (Han). Against the background of the active natural reproduction of this region, this will lead to a substantial increase in its population. Accordingly, this will require an increase in both the agricultural and industrial potential of the region and its availability of water. Meanwhile, the Xinjiang Uygur Autonomous Region is the least water-rich area in China. Xinjiang possesses water resources of only 26.3 cubic kilometers per year, which allows only 18 million people to be provided with water. But now the population of the region is about 20 million people with the potential for further growth. There are many desert areas, especially the Tarim Depression in the Kashgar region. In the area, water costs consumers 0.39 yuan per cubic meter.

Thus, China's position on transboundary rivers is closely dependent on the situation in the Xinjiang Uygur Autonomous Region. In this context, in fact, are the actions of China on the use of transboundary rivers.

Of course, voluntary measures cannot solve the problem of the use and quality control of waters of transboundary rivers. This is due to the following facts.

Firstly, in accordance with Article No. 4 of the "Agreement between the Government of the Republic of Kazakhstan and the Government of the People's Republic of China on Cooperation in the Use and Protection of Transboundary Rivers" [8], Kazakhstan cannot oppose the PRC's plans to expand the water intake of the Ili and Irtysh rivers, so as this is the rational approach of the Chinese side.

Secondly, Kazakhstan's dependence on many economic and trade issues on the PRC, for example, on energy cooperation, should be taken into account. In this regard, it was not by chance that in 2007 Kazakhstan offered China to exchange for the flow of transboundary rivers, primarily Ili and Irtysh, for a preferential contract for food supplies. However, China rejected this proposal.

The environmental and economic consequences of using the transboundary rivers Ili and Irtysh are not beneficial for any of the countries. So, given the above facts, we should expect a decrease in water resources in the Irtysh River basin: by 2030 by 8 cubic meters. km, by 2040 - per 10 cubic meters. km, by 2050 - by 11.4 cubic meters. km All this will lead, firstly, to a significant reduction in electricity production at the cascade of hydroelectric power plants in the Irtysh River to 25% by 2030 and to 40% by 2050. This will also contribute to the actual cessation of shipping in Kazakhstan on this river since 2020. Secondly, this situation will lead to practical degradation of canals and reservoirs (Bukhtarma and Shulbinsk) in Kazakhstan, fed from the Irtysh River.

Thirdly, surface water quality deterioration and groundwater pollution will occur.

Fourthly, if a massive withdrawal of the Irtysh waters from China begins, then the Irtysh riverbed throughout Kazakhstan and to the city of Omsk can become a chain of swamps and still water. It is clear that this will lead to a catastrophic deterioration of not only the environmental, but also the economic situation in the region.

Fifth, the implementation of the PRC's plans to increase the water intake of the Irtysh through canals and other hydraulic structures will bring the drying up of Lake Zaysan, which feeds on the waters of this river, first of all [9].

The solution of the problem by the two states led to the fact that on September 12-13, 2001, during the official visit of the Premier of the State Council of the People's Republic of China Zhuzhongji to Kazakhstan, an Agreement was signed between the Government of the Republic of Kazakhstan and the Government of the People's Republic of China on cooperation in the field of joint full use and protection of transboundary rivers. According to the researchers, "In the context of successfully resolving border problems between the Republic of Kazakhstan and the PRC, the fact of the beginning of negotiations (or as the Chinese side prefers to call them consultations) on the use and protection of transboundary rivers and the signing of the above Agreement is an important success of Kazakhstan's diplomacy. These questions were repeatedly raised by the Soviet Union, but did not find a response from the Chinese side" [10, p.28].

On November 13, 2010, during the 7th meeting of the Kazakh-Chinese Joint Commission on the Use and Protection of Transboundary Rivers in the city of Karaganda, an Agreement was signed on the joint construction of the Dostyk integrated waterworks on the Khorgos River, which is a tributary of the Ili River. (It should be noted that in 1992-1993, Kazakhstan and China signed the Protocols on the joint construction of a combined water intake on the Khorgos River.) It is assumed that through this water system it will be possible to use water resources in equal volumes for both sides. This agreement was the most significant result for the entire period of the commission [10, p. 30].

In July 2011, the first results of mutual surveys of gauging stations on the river were considered. Irtysh. At this meeting, on the proposal of the Kazakhstani side, the issue of reconstruction of the hydroelectric facility on the Sumbe River [11], which was built on the basis of an agreement in 2008 and infringing on our water interests at present, was also considered.

Along with this, joint work on the technical aspects of water allocation on transboundary rivers between the two states began to find their concrete implementation (the planned dates are 2011-2014). In 2011, an agreement was also signed between Kazakhstan and China on a joint division of resources of transboundary rivers Ili and Irtysh by 2014 [9].

But in general, the main thing is that certain shifts have been outlined in solving the problem, the barrier of previous preconceptions has been removed and this direction of bilateral cooperation in the future will have a positive trend. In this regard, Kazakhstan highly appreciates the beginning of the negotiation process on the legal settlement of the problem of transboundary rivers between Kazakhstan and the PRC. A positive moment today is Beijing's statement that the PRC will not adhere to the position of national egoism in the water issue.

The settlement of water relations with China seems very important from the point of view of economic and environmental security of Kazakhstan. The task should be aimed at maintaining the necessary water balance of rivers, working out a common position in the joint use and protection of water resources of transboundary watercourses, and prevention of their pollution and depletion.

**Conclusions.** An analysis of the problems of transboundary water bodies made it possible to develop recommendations for their elimination. To this end, the following activities are required.

1) At the legislative level, it is necessary to sign fundamental documents on legal issues of water allocation and protection of transboundary rivers on the basis of international law and bring the problem of transboundary rivers to the level of the SCO and tripartite negotiations (Russia, Kazakhstan, China)

2) It is necessary to continue the construction of joint waterworks on transboundary rivers, which will prevent massive water withdrawal from the Chinese side. A possible shortage of water supply from transboundary rivers in the Republic of Kazakhstan can be avoided by introducing resource-saving technologies, for example, closed water circulation at industrial enterprises, drip irrigation technologies in agriculture. As a result, it is quite possible to halve by 2040 the specific norms of water consumption. In this aspect, the introduction of engineering systems of flooding and development of floodplains is possible.

3) It is necessary to create a unified (at the level of two countries) system of training and retraining of personnel of hydrological services, to expand, improve and modernize their monitoring network (gauging stations, etc.) in all river basins of Kazakhstan and China.

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### ТРАНСШЕКАРАЛЫҚ БАССЕЙНДЕРДЕГІ СУ ОБЪЕКТІЛЕРІНІҢ ЭКОЛОГИЯЛЫҚ ҚАУІПСІЗДІГІН ҚАМТАМАСЫЗ ЕТУДІҢ НЕГІЗГІ БАҒЫТТАРЫ

**Аннотация.** Мақала трансшекаралық су объектілерінің экологиялық қауіпсіздігін қамтамасыз ету саласындағы халықаралық ынтымақтастықтың басым бағыттарын талдауға арналған. Мақала авторлары экологиялық қауіпсіздіктің келесі бағыттарын атады: Орталық Азия елдерінің су-энергетикалық мәселесі; климаттың өзгеруінің суға әсері; Арал экологиялық дағдарысы және оның Орталық Азия аймағының қоршаған ортасына тигізетін зардаптары. Мақала авторлары трансшекаралық су объектілерінің экологиялық мәселелерін жою бойынша ұсыныстар жасады. Халықаралық құқық негізінде суды бөлу және трансшекаралық өзендерді қорғаудың құқықтық мәселелері бойынша негізгі құжаттарға қол қою және трансшекаралық өзендер проблемасын ШЫҰ деңгейіне және үшжақты келіссөздер деңгейіне шығару ұсынылады (Ресей, Қазақстан, Қытай). Трансшекаралық өзендерде бірлескен гидроэнергетикалық құрылыстар салу қажеттілігі негізделді. Авторлар Қазақстан мен Қытайдың барлық өзен бассейндерінде қадағалау желісін (өлшеу бекеттері және т.б.) кеңейтуді, жетілдіруді және жаңартуды ұсынады.

Мақала авторлары трансшекаралық су объектілерінің оларды энергия көзі ретінде пайдалану нәтижелеріне талдау жасады. Орталық Азия аймағындағы су-энергетикалық проблема бүгінде халықаралық деңгейде шешілуді қажет етеді. Қазіргі кезде трансшекаралық су объектілерін пайдалану туралы екіжақты және көпжақты келісімдер жеткіліксіз жұмыс істейді, олардың көптеген стандарттары ескірген және жетілдіруді және қайта қарауды қажет етеді. Бұл мәселені шешу үшін авторлар су-энергетикалық проблемасын шешудің жаңа тәсілдері мен жаңа деңгейдегі бірыңғай стратегияны әзірлеу қажеттілігін негіздейді.

Мақала авторлары экологиялық қауіптерді талдай отырып, климаттық құбылыстардың су объектілерінің жай-күйіне әсер етуіне байланысты мәселелерге назар аударады. Авторлардың пікірінше, өзендер мен көлдердің жағдайын жақсарту және оларды бұршақ, құрғақшылық, өте жоғары немесе төмен температура сияқты табиғи құбылыстардың теріс әсерінен қорғау, аймақтың экологиялық қауіпсіздігін қамтамасыз етудің келісілген мемлекетаралық тәсілінсіз мүмкін емес.

Авторлардың пікірінше, Арал экологиялық дағдарысы жеке экологиялық проблема болып қала береді. Әлемдік қоғамдастықтың Арал теңізін құтқаруға бағытталған іс-шараларының көптігіне қарамастан, бүгінде экологиялық дағдарыс жалғасын таба алмады. Арал теңізін суаратын өзендер – Амудария, Сырдария, оның өзендерімен қоса 6 елдің шекараларын кесіп өтеді және осы мемлекеттер белсенді қолданады. Бұл өзендерді ұтымсыз пайдалану Арал теңізінің кебуіне әкелді. Экологиялық проблеманы шешу мемлекеттер арасындағы келісімдерді орындау болып саналады.

Авторлар Іле және Ертіс трансшекаралық өзендерінен су алудың артуына байланысты проблеманы алға тартады. Осы өзендер аумағы арқылы ағатын Қытай, Қазақстан және Ресей осы өзендердің экологиялық қауіпсіздігін қамтамасыз ету үшін шаралар қабылдауы қажет. Алайда бастауы трансшекаралық өзендердің аумағындағы Қытайдың ұстанымы халықаралық ережелерді сақтау бойынша кез-келген міндеттемелерді қабылдаудан аулақ болады, сондықтан Қазақстан үшін су проблемасын оң шешуге қатысты Қытаймен қарым-қатынасты реттеудің маңызы зор.

**Түйін сөздер:** су ресурстарын басқару, су қауіпсіздігі, трансшекаралық су объектілері, ортақ су пайдалану, экологиялық қауіпсіздік.

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### ОСНОВНЫЕ НАПРАВЛЕНИЯ ОБЕСПЕЧЕНИЯ ЭКОЛОГИЧЕСКОЙ БЕЗОПАСНОСТИ ВОДНЫХ ОБЪЕКТОВ В ТРАНСГРАНИЧНЫХ БАССЕЙНАХ

**Аннотация.** Статья посвящена анализу приоритетных направлений международного сотрудничества в области обеспечения экологической безопасности трансграничных водных объектов. Авторами статьи обо-

значены такие направления обеспечения экологической безопасности, как: водно-энергетическая проблема Центрально-Азиатских стран; воздействие изменений климата на водные ресурсы; Аральский экологический кризис и его последствия для природной среды Центрально-Азиатского региона. Авторами статьи предложены рекомендации по устранению экологических проблем трансграничных водных объектов. Предлагается подписание основополагающих документов по правовым вопросам вододелия и охраны трансграничных рек на основе норм международного права и вынесение проблемы трансграничных рек на уровень ШОС и трехсторонних переговоров (Россия, Казахстан, Китай). Обосновывается необходимость строительства совместных гидроузлов на трансграничных реках. Авторами предлагается расширить, усовершенствовать и модернизировать сеть контроля (гидропосты и т.д.) на всех речных бассейнах Казахстана и Китая.

Авторами статьи проведен анализ состояния трансграничных водных объектов в результате их использования в качестве источника энергии. Водно-энергетическая проблема в Центрально-Азиатском регионе сегодня требует скорейшего разрешения уже на международном уровне. Существующие двусторонние и многосторонние соглашения по использованию трансграничных водных объектов сегодня недостаточно работают, многие нормы их устарели и требуют совершенствования и пересмотра. Для решения данной проблемы авторами обосновывается необходимость разработки единой стратегии на новом уровне и с новыми подходами к решению водно-энергетической проблемы.

Авторы статьи, анализируя экологические риски, выдвигают на передний план проблемы, связанные с воздействием климатических явлений на состояние водных объектов. По мнению авторов, улучшение состояния рек и озер, ограждение их от негативного воздействия природных явлений, таких как град, засуха, экстремально высокие или низкие температуры невозможно без согласованного межгосударственного подхода к обеспечению экологической безопасности региона.

Отдельной экологической проблемой, по мнению авторов, остается Аральский экологический кризис. Несмотря на большое количество мероприятий со стороны мирового сообщества, направленных на спасение Аральского моря, сегодня экологический кризис еще не изжил себя. Реки, питающие Аральское море – Амударья, Сырдарья, включая их притоки – пересекают границы 6 стран и активно используются этими государствами. Нерациональное использование этих рек привело к высыханию Аральского моря. Решение экологической проблемы заключается в выполнении договоренностей между государствами.

Авторами выделяется и проблема, связанная с увеличением водозабора из трансграничных рек Или и Иртыш. Китай, Казахстан и Россия, по территории которых протекают эти реки, обязаны принять меры по обеспечению экологической безопасности этих рек. Однако позиция Китая с истоками на территории трансграничных рек избегает принятия каких-либо обязанностей по соблюдению международных правил. Поэтому для Казахстана является важным урегулировать отношений с Китаем относительно позитивного решения водной проблемы.

**Ключевые слова:** управления водными ресурсами, водная безопасность, трансграничные водные объекты, совместное водопользование, экологическая безопасность.

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