

CONDITION OF WATER CONSUMPTION IN CENTRAL ASIAN COUNTRIES

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Central Asia, which includes Kazakhstan, Kyrgyzstan, Turkmenistan, Tajikistan and Uzbekistan for many centuries, lacks water resources. The basis of life in the region has always been agriculture and animal husbandry, and water is the major limiting factor. After independence, the Central Asian republics directed their efforts to lift the economy and the formation of new state institutions. At the same time without the permission remained one of the most important issues, distribution of water resources of transboundary rivers between the countries of the region.

Formation of surface runoff of the major transboundary rivers is complex, combining economic, water, energy, environmental and political problems.

Sustainable ecological and economic development of the countries of the Central Asian region suggests the need for modification of the schemes of exploitation of the potential of transboundary rivers in Central Asia with the purpose of increase of efficiency of their complex use based on the principles of preservation and improvement of mountain and valley ecosystems, rational use of water and energy resources in order to improve the competitiveness of economies and the deepening of water-energy integration in the region.

In recent years, the countries of Central Asia on the basis of international water jurisdictions, efforts are being made to develop national priorities towards optimising the interests of the countries of the region the rational use and protection of water resources of transboundary rivers. One of the most important elements of the mechanism of management and protection of transboundary water resources is the principle of expanding international cooperation in the field of rational use of water resources in the framework of international legal norms, and the aspirations of the countries of the region for joint solutions to international disputes concerning both qualitative improvement and quantitative division of water.

Separately each country develop the economy, mainly agriculture, but in most cases not fully taken into account the economic interests of other countries. Currently, the mechanism for coordinated use of water resources in the region does not work because of the diversity of interests of subjects of water use, which to some extent is the result of the ambiguity diagrams of their distribution. The situation is complicated by the fact that countries are constantly building up their confrontational politics of water use in the region, accusing each other of violating international and other norms of transboundary water management. All this causes enormous damage to the economy, increases environmental problems and becomes a major factor in the unsustainable use of water and energy resources, which affect the competitiveness of the region's economies.

The problem of providing the Central Asian region with water of the states - one of the most important and most urgent problems of the present days. This problem is sectioned into a series of components, which are main:

- providing the population with water for domestic needs;
- providing region with water of the national economy, both industry, and agriculture;
- the solution of the environmental problems which arose in the course of the solution of these tasks.

As a well-known and the main waterways of this region are Amu Darya and the Syr Darya. About 45 million people live in the district and use water of these rivers. The general total volume of water in these rivers - 100-200 billion cubic meters annually, depending on weather conditions in Central Asia (tab. 1).

Table 1.

Resources of underground waters of the Aral basin

Countries	Year	underground waters	
		Regional resources, km ³ /year	Operational stocks, km ³ /year
Kazakhstan	2016	1,945	1,324
Kirgizistan	2016	0,982	1,008
Tajikistan	2016	7,654	3,196
Turkmenista n	2016	4,358	2,224
Uzbekistan	2016	20,679	7,781
Totally in Aral basin			15,533

The main water consumers of the pool are:

- about 92% of water resources - irrigation;
- from 3.5 to 4% - cultural - drinking and municipal water supply;
- 2% - industrial technical water supply;
- 1.5% - agricultural water supply;
- 0.5% - other water consumers (fishery).

Assessment of the CA water resources will be incomplete without returnable waters of components a considerable share of a superficial drain. Returnable waters are the collector and drainage drain which is formed at irrigation, sewage of industrial and household sectors.

The mean annual volume of returnable waters are 36 - 38 km³. A part of returnable waters is reused on irrigation, a part - dumped to the rivers and natural decreases: Sarikamish (in lower reaches of Amu Darya), Arnasay (the average Syr Darya Current).

At assessment of total size of a superficial drain, The central Asian regions are also accounting of channel losses of a drain and losses on evaporation and filtration from reservoirs is necessary. By results of water-balance calculations these indicators fluctuate in repartitions 9,1-14,4 km³/year, including losses on evaporation and filtration reach 2 km³/year.

Thus, taking into account stated, the total mean annual superficial drain of the Aral basin makes the 154-158th 3

This volume of water resources is involved in management processes, distributions, uses.

The qualitative structure of water resources of the region develops in a zone of formation of a drain under the influence of natural factors, and in a zone of transit and a dissemination of a drain – mainly, under the influence of anthropogenic factors. The quality of water in the rivers at the exit from a zone of formation meets all standard requirements for different types of water

use. And further deterioration in a qualitative state is connected with dumping of waste and collector and drainage waters directly to the rivers and other water objects.

Possessing powerful hydropower supply sources, Tajikistan and Kyrgyzstan quite could provide own power independence, but contradictions of power and an irrigation in requirements of water, more precisely – on operating modes of reservoirs of long-term regulation were an obstacle to it. These contradictions from classical interindustry have got a political interstate shade. The largest water regulating constructions with hydroelectric power stations and massifs of irrigation have appeared on different sides of borders. There were serious problems because water is necessary for the states of a mountain zone during the winter period for power production on hydroelectric power station, and to the states of the lower zone – in the summer, for irrigation. The consensus was, will reach the conclusion of short-term agreements on use of water and hydroenergy resources of the Naryn-Sirdarya Rivers on the basis of barter supply of gas and coal instead of water and the electric power. The imperfection of these agreements is obvious as the damage from work of the Toktogul Reservoir and the cascade of Lower Naryn hydroelectric power stations in the irrigational mode estimated annually by millions of dollars is compensated to Kyrgyzstan not in full. Urgent development of modern approaches to permission of the existing contradictions is necessary. The main water consumer in the basin of the Aral Sea is the irrigated agriculture (ORZ)-91,6 of % of the total amount of water consumption, further follow: economic and drinking (HPV) and municipal water supply - 3,6%, the industrially technical water supply (ITWS) of-1,92%, agricultural-water supply (AWS)-1,56 of %, the fishery (F) of-0,78%, other-0,98%.

Volume indicators of the actual use of surface and underground water in the basin of the Aral Sea are given in tab. 2.

The actual use of water resources in 2016 the states of the basin of the Aral Sea (on branches of economy, one million m³)

Table 2.

Countries	Sphere of economy						Totally	Including	
	ORZ	HPV	ITWS	AWS	F	Other		Undergro und waters	Collector and drainage waters
Kazakhstan	143,2	133	197,4	158,3	9712,6	573,1	10917,6	423	126,1
Kirgizistan	30	81,2	53,7	-	4940	-	5104,9	514	67,9
Tajikistan	412	623	501	140	10338	17	12031	972	364
Turkmenistan	349	-	139	37	23291	5	23821	474	48
Uzbekistan	2582	950	1103	530	53416	595,1	58581	6900	4500
Totally in Aral basin	3373	1573	1994,1	865,3	101697,6	-	110455,5	9261	5158

For assessment of modern system of water division and the choice of criteria for development of new strategy indicators of individual share of the states in volumes of consumption of a surface water (tab. 3) have a certain interest.

Table 3.

Countries	It is used in surface water, km ³	%
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Kazakhstan	10,5	10,4
Kirgizistan	4,59	4,5
Tajikistan	11,06	10,9
Turkmenistan	23,35	23,1
Uzbekistan	51,68	51,1
Totally in Aral basin	101,18	100

And also the specific water consumption and specific security with the irrigated areas counting on 1 person (tab. 4).

Table 4.

Specific security of the population of Central Asia
surface water in 2016

Countries	Population mln.	Water intake from superficial sources, km ³	Specific water intake, one thousand m ³ /persons.	The irrigated area, one thousand hectares	The irrigated area, one thousand hectares Specific security, hectare/persons
Kazakhstan	15	10,5	4,0	786,2	0,3
Kirgizistan	5	4,59	1,8	429,5	0,17
Tajikistan	6	11,06	1,97	719,2	0,13
Turkmenistan	5,5	23,35	4,75	1744,1	0,36
Uzbekistan	26	51,68	2,34	4280,6	0,19
Totally in Aral basin	57,7	101,18		7959,6	

The indicators of the reached level of development of the irrigated agriculture as the most important branch of economy given in tables in the Central Asian region indicate a considerable lead of the state of the lower zone from the states of a mountain part of the region on specific indicators of water consumption and security with the irrigated land fund counting on one person.

The existing system of water division of cross-border waters of the pool Aral the sea doesn't answer sovereign statehood contradicts their constitutions and laws on water.

The principles of water division based on criterion of equal water security of the existing areas of irrigation absolutely not consider a contribution of the states of a mountain zone to formation of water resources of the Aral basin their share makes: 55,4%-Tajikistan, 25,3% - the Kyrgyz Republic, and volumes of the limited water consumption respectively-10,9 and 4,5%.

The allocated limits of water resources are limited in a possibility of development states of a mountain zone of the irrigated agriculture for increase in security of the population with agricultural products to rated biological requirements. The limited water division imposes restrictions for work of hydropower objects of these states, causing significant damage in the form of decrease in winter development on hydroelectric power stations and need of purchases of additional energy resources for the states of the lower zone.

The control system of water resources are existing nowadays and there are no principles of an integrated approach to management and using of it.

Currently, the regional economy as the leading area of the study of rational allocation of economic entities and efficient use of natural resources in conjunction with the principles of the new economic geography, regional integration, cooperation and clustering, including the coordination of economic interests of competing parties is rapidly growing. In the arsenal of database methods and techniques of the regional economy added methodological installations, primarily associated with computer technology and able to eradicate the different interests in the process of rationalizing the use of natural resources, the most difficult of which is the sharing of water-energy resources of transboundary rivers.

Analysis of water resources should be carried out not only in the country in General, but also taking into account regional disparities. While the core requirement is the consideration of the interests of neighboring countries in the Aral sea basin that use water resources originating from mountain ecosystems of Tajikistan and Kyrgyzstan.

Governance model the seasonal regulation of the sustainable use and allocation of water-energy resources of transboundary rivers in the region showed that Tajikistan and Kyrgyzstan are undergoing economic damage is mainly from under-utilization of their water and energy resources, and overcoming these problems can get the win without causing significant economic harm to other lowland countries of Central Asia.

The uneven distribution of water resources, intensive use and increasing water consumption are the main factors of its deficiency in the world. We should pay particular attention to the problem of water resources management of transboundary rivers, because of the correct decision, ultimately, will depend not only national development but also regional development of the States adjacent to the pool. The correct choice of strategies of States in water management and their desire for cooperation in this area depends largely on the prospects for regional water resources management of transboundary rivers for the benefit of all peoples living in this region.

The application of the coalition approach for simulation of game problems of water resources management of transboundary rivers of the Central Asian region allows the countries of basins of Syrdarya and Amudarya, to obtain positive results and tangible economic development without causing significant harm to each other. Thanks to the coalition approach Central Asian countries can achieve mutually beneficial results for the rational use of water resources that contribute to the strengthening and further development, both economic and political ties between these countries.

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ҲОЛАТИ ИСТИФОДАИ ОБ ДАР ДАВЛАТҲОИ ОСИЁИ МАРКАЗӢ

Мақолаи мазкур бо мушкилоти истифодаи захираҳои обии дарёҳои фаромарзӣ дар Осии Марказӣ, муносибатҳои марбут ба ин масъала ва танзими захираҳои обии дарёҳои фаромарзӣ дар ин минтақа таҳлил карда шудааст.

Собит гардидааст, ки масъалаи мазкур танҳо дар асоси ба назар гирифтани манфиатҳои ҳамаи кишварҳои минтақа метавонад ҳал карда шавад.

Калимаҳои калиди: минтақа, Осии Миёна, дарёҳои фаромарзӣ, захираҳои обӣ, исисфода- бари захираҳои обӣ, сиёсатгузорӣ, об, фаромарзӣ.

СОСТОЯНИЕ ВОДОПОТРЕБЛЕНИЯ В СТРАНАХ ЦЕНТРАЛЬНОЙ АЗИИ

В статье рассматривается проблема использования водных ресурсов трансграничных рек в Центральной Азии, анализируются подходы к регулированию водных ресурсов трансграничных рек в этом регионе. Обосновывается, что данная проблема может быть решена только на основе учета интересов всех стран, расположенных в регионе.

Ключевые слова: регион, Центральная Азия, трансграничные реки, водные ресурсы, использование водных ресурсов, трансграничность, вода, политика.

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The problem of the use of trans boundary water resources in Central Asia, examines approaches to the regulation of trans boundary water resources in the region. It is proved that this problem can only be solved by taking into account the interests of all countries in the region.

Keywords: region, Central Asia, trans-boundary rivers, water resources, water resources management, trans boundary water policy.

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