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ANALYSIS OF THE STATE OF USE OF WATER RESOURCES IN UZBEKISTAN

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Abstract: The article coordinates water resource management, water distribution, water monitoring, support of water resource-related activities at the state level, nature protection policy, develops and implements national strategies and programs for the implementation of established tasks on sustainable use of nature, Environmental Protection, the effectiveness of the organization of the water resource use system is estimated not only by economic, but also by, ways to organize a system of use by indicators of environmental and social efficiency of the use of water resources are indicated

Keywords: Water Resources, Water Resources Management, groundwater, management methods, management process, management mechanism, limited water resources, distribution level, Bashkir functions, environmental conditions, water demand, vertical management.

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INTRODUCTION

Water Resources play a huge role in ensuring the economic development of our country. Water Resources occupy a special place among nature resources and are incomparable in importance. Water is used in all branches of the national economy and in the life activities of the population. In this case, the use of Natural Resources is diverse in character and types. In particular, the development of irrigation agriculture has a special place in strengthening the country's economy. Therefore, it was not for nothing that among our people "there is water–there is life, where water is all, life ends."

The main water reserves that provide water to the countries of Central Asia are located in the chotqol, Pamir-Oloy and Tyanshan Ridge Mountains, which are in the form of permanent glaciers. 70-80% of the water reserves of the countries of Central Asia are located in the mountainous regions of Tajikistan, Kyrgyzstan and Kazakhstan. Currently, in the part of the Central Asian states that are under the Island Sea basin, 8 million tons are allocated. the acres are irrigated. In the same area, 126.9 crore is suitable for drinking and irrigation in one year. m3 water appears. The volume of water that appears in the area is from 15,750 m3 at the expense of each hectare of irrigated land. If a cotton crop is grown on an acre of land from which an average yield of 25-30 centners is obtained, the volume of water from the source for irrigation of an acre of land is at least 10,000 m 3. It follows from this that if the sum of these gods spend a lot of water is farmed into yevazi, for example, in the Republic of Uzbekistan on average 67 billion in a year. m3 of water is

consumed, of which 50 billion. M3 irrigation is used for farming. On average, 11-12 thousand m3 of water is spent on each hectare of irrigated land.

Within the framework of the new Uzbekistan development strategy, the following tactical and strategic directions have been developed in Uzbekistan: “State program for the protection of nature and the effective use of natural resources for the period from 2022 to 2026”, “National Action Plan for Environmental Protection and sustainable development in the Republic of Uzbekistan”, “National Action Program on environmental hygiene in the Republic of Uzbekistan”, “national These documents outline the form of the relationship between society and nature of our state, what it will be like now and in the future, the ecological concept, purpose and principles of Uzbekistan. The tactical and strategic action program and directions for the implementation of environmental goals and objectives are outlined. In particular, according to the decree of the president of the Republic of Uzbekistan “development strategy of New Uzbekistan for 2022-2026” No. PF-60 of January 28, 2022, a strategy is established to adapt the institutional framework of environmental management of the economy to the requirements of the time. [1]

On the basis of the Republic, the completion of the work to mark the sanitary protection zones and coastal regions of 51 surface natural water facilities (rivers, small rivers and natural lakes)and the transformation of Tashkent City into an area accessible to the population, environmentally friendly and with all opportunities for living, bringing the level of landscaping to 30%.

Building an additional 500,000 hectares of green spaces on the dry bottom of the Aral Sea to bring their total volume to 2.5 million hectares or 78% of the territory by the end of 2026, to implement projects worth US $ 300 million based on International “Green Climate” in the Aral Sea and Global environmental funds programs aimed at preventing biodiversity, climate change and soil, Further strengthening of the social support of the population living in the oryolbuyi region was established.

Analysis of thematic literature. The Central Asian region is one of the economic regions where irrigation agriculture has developed in rural agriculture. The main water reserves are Amudarya and Syrdarya, which are part of the Aral Sea basin. The favorable natural climatic conditions and rich land-water resources of the area have provided great opportunities for the development of irrigation agriculture. Its effectiveness is directly linked to the water supply. The irrigated area of the Republic of Uzbekistan is 4.2 million. makes up a hectare. Water reserves of 55-60 km3 are needed to meet the water consumption of agricultural crops in the Republic. At the borders of the Republic there is an opportunity to collect only 20% of the required water, the remaining 80% water enters our homeland through the republics of Tajikistan, Turkmenistan, Afghanistan and Kyrgyzstan. Therefore, the reservoirs under construction in the Republic will continue to be a huge vital necessity for the country. Water supply in the territories of the Republic is carried out using reservoirs, based on the graph of water consumption. The Aral Sea basin has a useful water capacity of. m more than 3 reservoirs are being built and used.

Despite the abundance of water resusrs worldwide as well as the largely renewable nature of this resource, one fifth of the world's population lives in water scarcity conditions. This is primarily the result of the uneven distribution of fresh water over space and time, which is the main driving factor for economic imbalances, irregularities and failures. Accordingly, many approaches have been formed in the effective use of water resusrs and their accounting. [2]

The supply of water from source to consumer is provided by a hierarchy of horizontal and vertical controls. Each of these levels has its own factors of water supply instability, which are different in nature and degree of influence. Uzbekistan's Water Resources Management System is optimally represented, consisting of 4 hierarchical levels. [3]

In international practice, the main approaches to effective water resource management are based on the concept of Integrated Water resources management (IWRM).[4] This concept recognizes water circulation in all its natural aspects, as well as the interests of water users in different sectors of society (or the entire region); therefore, it refers to both the natural and Human Dimensions of water.

Ciriacy-Wantrup S.V. in the studies of others, two approaches are proposed to assess the use of Water Resources. First, through the various computational techniques of profit-cost analysis seen through the use of ruv resusrs. The second approach is based on the establishment of established standards of Water Resources and the identification of differences and deviations in relation to them. [5]

In contrast, research by Zhaoyang Yang and others has done serious research on the water resources carrying capacity-WRCC concept. This study created a sumulation model of water resource transfer capability based on analytic hierarchy process (analytic hierarchy process-AHP) and System Dynamics (SD) models. Based on this simulation model, options in 5 Scenarios for the effective distribution of water resources by country areas are proposed. [6]

It is required to effectively manage water resources, keep their accounting and hiso-bot full-fledged, improve the relationship between water consumers and improve the activities of water farm special services, which are established in order to widely involve the private sector in these processes. [7]

Research methodology. The paper made extensive use of comparative comparison of efficient use of Water Resources, statistical data study and economic comparison and analysis, logical reasoning, scientific abstraction, analysis and synthesis, induction, and deduction techniques.

Analysis and results. The total volume of water that will be organized in the territory of Uzbekistan is 8-10 billion. there will be no more than m3, that is, about 1000 m3 of water will be built at the expense of each hectare of irrigated land. From this we conclude - due to the fact that Uzbekistan is located in the semi-Saharan and sub-Saharan regions, the water shortage in its territory is extremely strong. So, more than 80% of the water consumed in our country flows from the territory of Kyrgyzstan and Tajikistan. The level of water supply in the territory of our country is given below (table 1).

Table 1. Land and water supply levels by God

Name of Regions	The per capita population was.		1 hectare corresponds to irrigated land, thousand m^3
	Irrigated land, ga	Water Resources, ing m^3	
Republic Of Karakalpakstan	0,46	6,8	18,9
Andijan	0,24	1,66	18,9
Bukhara	0,25	3,21	19,2
Jizzakh	0,35	3,25	11,1
Caloptilia	0,36	3,24	13,4
Navoi	0,19	2,98	14,4
Namangan	0,19	1,72	11,8
Samarkand	0,21	1,75	11,8
Surkhandarya	0,20	2,34	15,2
Syrdarya	0,58	5,86	11,9
Tashkent	0,19	1,42	9,7
Fergana	0,17	0,73	19,7
Khwarazm	0,24	3,96	20,6

The unevenness in the distribution of water by the territory of the country is exacerbated by its seasonal changes. The distribution of water balance and its distribution by year, Seasons is greatly influenced by the water supply of rivers. The main source for most rivers of our country is snow in the mountains. The main water flow in such raions falls on the spring season. The main source of water for amudarya and Syrdarya are glaciers, with a large part of the water flowing in the summer season. The unfavorable distribution of river waters throughout the seasons makes it difficult to use water resources and creates a strain on farm balances. Freshwater scarcity water is especially sharply felt in the arid region, where the bulk of the resources go to irrigate the yekins.

Water is the main task of the water farm complex to develop recommendations on the scale of the region to meet the need for water in the conditions of the emerging shortage of resources. The settlement is carried out according to the unified inter-sectoral scheme of rational use of water, which is concluded in order to distribute water in a reasonable way in each of the networks of complex use of Water Resources. Almost all large basins have water management schemes that characterize the state and prospects for the development of water management.

Water supply is the supply of water to consumers. The development of regional productive forces, the availability and location of labor resources will be associated with water supply. Water supply imposes higher requirements on the quality of water than on other types of Water Management Complex. The following types of water supply are distinguished: municipal, industrial, agricultural, railway, etc. Any type of water supply has its own characteristics.

The amount of Water Resources that Uzbekistan can own (taking into account the 11.5 km3 flow of its rivers) under the conditions of seasonal management of the amudarya flow and the need to control the Syrdarya flow for a long year is 63.02 KM3 according to the interstate agreement (Table 2).

Table 2. Approved amount of water resources for Uzbekistan, km³

River	Özan	Loops	Total	Groundwater	Collector-drainage flows	Total
Syrdarya	10,49	9,2	19,69	1,59	4,21	25,49
Amudario	10,49	6,98	33,9	1	2,63	37,53
Total	37,41	16,18	53,59	2,59	6,84	63,02

The flow of Rivers is reduced to a serious imbalance of year duration and many years, and on average to 23 KM3 in the year of low water (when water reaches 90 percent) than in the year of spring. Succulents are repeated intermittently between 6-10 years and last for 2-3 years. However, years with a water deficit are more often observed at intervals of 4-7 years, and this condition can last up to 6 years

The change in flow within a certain period is significant: during a period of low water, which lasted 8 years (1960/61-1967/68), the amudaryo flow was only 90% of the norm. During the 2-year period of serfdom (1968/69-1969/70), this figure increased by 30% from the norm.

The change in the annual flow is expressed in the coefficient of marginal change: the higher the value of the coefficient, the more the flow changes (Table 3).

Table 3. River flow supplied to varying degrees, km³

River Landing	Provisioning			Sv
	50%	75%	90%	
1. **Amudarya Basin**	**73,69**	**66,68**	**61,41**	
Vakhsh-Tutkaul	20,17	18,44	17,00	0,13
Panj-lower Panj	33,84	30,92	28,50	0,12
Kofirnihon-jami rivers	5,56	4,91	4,38	0,18
Surkhandarya-jami rivers	3,72	3,22	2,89	0,19
Sleeve multi-flow from Beaver River	4,11	3,57	3,57	-
Kashkadarya-total rivers	1,04	0,85	0,70	0,29
Zarafshan-Dupuli+Magiyondarya-Suji	5,25	4,77	4,37	0,14
Syrdarya Basin	**34,32**	**28,86**	**24,62**	
Norin-Tukhtagul	13,76	11,75	10,18	0,23
Rivers of the Fergana Valley	11,61	9,69	8,22	0,25
Chirchiq, Angren, Keles	6,59	7,11	5,95	0,27
Mid-Current rivers	0,36	0,31	0,27	0,21
Jami to Chordara reservoir	34,32	28,86	24,62	
Total	108,01	95,54	86,03	

The periodicity of river flow changes and the long duration of the water deficit make it difficult to use water sources in the farm, necessitating the flow being managed through a reservoir system.

The reservoir is a hydrotechnical facility designed to supply water to the consumer during the winter season at the expense of the waters of streams and rivers, filling its capacity in the ring farm Sox and in the areas of developing yelektroenergy.

There will be three types of water levels in the reservoir: normal steamed surface (NDS), accelerated steamed surface (JDS), and unused (dead) volume level (FHS). The volume between the NDS and FHS in the upper BEF is called the useful volume, while the FHS is located at the bottom – the unused (dead) volume.

Until now, multiple classifications of reservoirs by different designations have been proposed. There are more than 60 reservoirs in the Aral Sea basin, with a useful volume of 10 million.more than m3. The total volume of all reservoirs is 64.5 km3, of which 46.5 km3 is a useful volume. The reservoir is a hydrotechnical facility designed to supply water to the consumer during the winter season, filling its volume at the expense of the waters of the streams and rivers, in the ring farm Sox and in the yelektrostation areas.

The reservoirs are mostly of two types:

1. Drop reservoirs-bunda supply water to the reservoir through special channels. Water in these reservoirs is brought by pumps. But if these reservoirs are overrun with mud, it is impossible to clean them at all, and in order to prevent this, great importance is attached to the clarity of the water.

2. Peat reservoirs consist of retaining water by preventing runoff in the reservoir. In these reservoirs, all mudflats in the stream come and remain in the reservoir. As a result of this, the pouring will go faster than in reservoirs to become muddy.

It is used for irrigation of reservoirs and for hydropower purposes. The following phenomena occur in this:

- when used for irrigation, sediments of useful size are pushed towards Dead Volume;

- it becomes difficult for water-loving plants to grow out of the reservoir;

The main ouzanli reservoir to control the flow of amudarya and Syrdarya is located outside Uzbekistan. Except for reservoirs in Andijan, Tuyamuyin and Southern Surkhandarya (Table 4). The system of all these reservoirs was designed to work in the irrigation-yenergetic order. Currently, the flow in the amudaryo Basin is only seasonally controlled (the full capacity of the Nurek reservoir is 10.5 km3, the capacity of the Tuyamoyin reservoir is 7.3 km3).

The flow of the Syrdarya is set at an amount of 34 km3, provided that the stagnant reservoir works in the irrigation-yenergetic order. The Qayroqkum warehouse, located in the middle reaches of the River in the territory of Tajikistan, has a working capacity of 2.5 km3. Yega Chordara reservoir with a useful capacity of 4.7 km3 works in irrigation order for water users at the foot of the Republic of Kazakhstan.

Table 4. Ouzanli reservoirs in the amudarya and Syrdarya basins

Reservoir	The useful capacity is million.m³	River
Amudarya Basin		
Nurek	4500	Vakhsh
Tuyamuin	4500	Amudario
Surkhandarya South	700	Surkhandarya
Syrdarya Basin		
Stoppage	14000	Norin
Chordara	4700	Syrdarya
Kayrokkum	2500	Syrdarya
Andijan	1750	Karadarya

When considering issues of Reservoir Water Resources and water balance and their impact on river flow, classification of reservoir by Origin is used. According to this sign, 3 types of sleeve characters of reservoirs are distinguished:

- River reservoirs created in river valleys;
- ash reservoirs created by lake water rise;
- the reservoir that occurs in connection with the filling of adapted kotlavans, which are specially carried by river water, is the River Reservoir, where the sleeve is abundant.
- underground; Marine reservoirs;
- the reservoir of dump waters, can be divided into collectors.

Reservoir position (Basin): area or area bounded by a dam on the slopes, bottom and slope affected by water pressure of the River Valley to the yega (intended for collecting water). The reservoir capacity is yega to the following indicators: volume or capacity; surface area; depth of water; length and length of the bank; length of the embankment.

The complexity of the management system for the use of Water Resources is distinguished not only by the fact that it is composed of a large number of infrastructures, but also by the fact that they are inextricably linked. Therefore, due to the essence and importance of the systematic approach (substantiating the adoption of complex decisions in all areas and ensuring the connection between them), the sleeve is an effective method. To do this, it is important to analyze the structure and principles of operation of the system and to analyze the surrounding lighting and the aspects, interrelationships and internal structure inherent in all its structural elements. That is, it is necessary to take into account the individual elements of the water resource use management system and their interaction, which are manifested as a complex system, and determine the position of each item in the system's activities.

The reservoir is yekspluated as reservoir use Administration‖ and the irrigation systems of the reservoir yekspluation administration are subordinated to the basin administration. The structural outline of the management is given below.
The effectiveness of organizing a system of water resource use is assessed not only by economic, but also by yekological and social efficiency. It is precisely the importance of yekological and social efficiency that increases. If the selected option meets the criteria set for the efficiency indicator, it is possible to proceed to the next stage – the organization of water resource utilization system management.
The control process is simple, that is, it can be carried out both conventional and automated. In this case, the automated system for managing the use of Water Resources will consist of two parts – an automated system for managing technological processes and an automated system of administrative control processes.
Water management is a complex management object, and it is difficult to imagine its automated management without human participation. Participation in the organization of a certain structure of the human water resource utilization system as well as the final decision-making in the management of the system's activities will be achieved. This can usually be-a state body or a group of management employees.
If unsatisfactory results are obtained as a result of a comprehensive assessment of the effectiveness of the option under consideration, then the decisions made must be revised. At the stage of Organization of the system, first of all, the composition of the structure and technical means is revised, at the stage of its use, the procedure for distributing yesa water is changed. In these situations, it is necessary to consider individual participants (partially or completely) of the Aquatic Complex.
Conclusion. In our republic, water resources are distributed disproportionately from an economic and social point of view, that is, the place of residence of the population, the location of agricultural production and do not eat according to other norms. For example, in areas where water bodies are nearby, the water supply is high and the water consumption increases as it moves away from them. This yehtiyoj will continue to increase from year to year, since the volume of water does not increase, the population and household services, industry, construction and other industries are increasing. Therefore, in our view, in order to solve this problem in the near future, it is necessary to carry out a set of activities in the following directions:
- water saving by reducing water waste (switching to circulating water supply);
- the use of new, promising methods of irrigation and improving the efficiency of the irrigation system;
- proper (in time and space) distribution of groundwater and surface water;
- introduction of quality impaired water treatment technology;
- finding opportunities to take advantage of water resource reserves in glaciers and mountain basins;
- active exposure to the processes of precipitation formation (according to the Hydrometarcase of Uzbekistan, it is possible to create precipitation in an area of up to 100 km2, that is, not relatively large).
The influence on the management of the use of Water Resources is carried out mainly with the help of technical methods (control of water flow, transfer it from one place to another, use of additional local resources). In this regard, it should be noted that the impact on the saving of Water Resources and the effective use of water is achieved through:
1. Water and water use and nature conservation laws.
2. Sub-legislation: standards, boundary indicators, regulations, norms, permits and licenses.
3. Administrative methods (improvement of the management system for the use of unified, territorial and local water resources).

4. Economic methods (remuneration for disposal of water and wastewater, fines for violation of the established standards for disposal of wastewater, recovery of losses from contaminated water, introduction of dotations and subsidies for the implementation of wastewater treatment activities, attracting investments to implement new production technologies, etc.).

It should be noted that Uzbekistan is the leading country in water consumption. The share of consumed water resources in the available water resources is 49.7% in the amudaryo catchment area and 48% in the Syrdaryo catchment area. It is known that 11.47 km3 of internal water resources are formed on the territory of the Republic, of which 4.82 km3 corresponds to the amudarya Basin, 6.65 km3 – to the Syrdarya Basin. The remaining more than 80 percent is replenished at the expense of cross-border water resources if eaten.

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