REGIONAL COOPERATION AND INTEGRATION IN CENTRAL ASIA IN AN ERA OF INCREASING WATER SCARCITY

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Abstract: *The article, based on currently available data and some theories in hydropolitics, aims to explain why water problem in Central Asia has arisen and its consequences. By using the PESTEL model, it also analyzes the ineffectiveness of agreements on solving the water problem in this region along with the factors behind it. The last part provides information about the importance of strengthening regional cooperation and integration among the Central Asia countries for solving water-related problems in recent years.*

Key words: *World Health Organization, The Central Asia, Amu Darya and Syr Darya, Hydraulic Civilization, Aral Sea, USSR, upstream and downstream, and Blue Peace Central Asia.*

INTRODUCTION

Water is an integral part of human life and is its primary source. It not only quenches people's thirst but also improves the flow of economic activity. Drought and water shortage have a significant impact on human life. According to World Health Organization(WHO), 50 million people around the world suffer from drought every year, also it is predicted that 40% of world population will face water shortage by 2030 and 700 million people will be forced to migrate [9].

The main factor causing water-related environmental problems is human activity. As an example, the drying up of the Aral Sea is one of the largest environmental disaster caused by human activity in Central Asia. Consistently increasing demand and decreasing available resources have already made water scarcity one of the main problems in this region. The Central Asia consists of five post-soviet countries namely Uzbekistan, Kazakhstan, Turkmenistan, Tajikistan, and Kyrgyzstan forming an area of four million square kilometer combined and nowadays around 80 million people reside in this region. Amu Darya and Syr Darya rivers are the main part of water resources formed by tributaries originating from the Pair and Tien Shan mountain Systems and flowing into the Aral Sea.

Due to the region's geographically arid location, agriculture can only be practiced through complex irrigation systems. Prior to its conquest by the Russian Empire in the late nineteenth century, the region had developed a hydraulic civilization over many centuries, possessing sophisticated irrigation systems capable of supplying water to vast territories. However, with the aim of mass specialization in cotton production, the Russian Empire

[9] https://www.who.int/health-topics/drought#tab=tab_1

introduced new irrigation technologies in the region. The sharp increase in water demand for cotton cultivation led to a significant depletion of water resources and a reduction in groundwater reserves. The diversion of large portions of the Amu Darya and Syr Darya rivers for irrigation purposes resulted in a drastic shrinkage of the Aral Sea basin by 1960.

By 1991, following the collapse of the Soviet Union, new states with still-unsettled borders emerged in the region. Since agriculture formed the backbone of the regional economy, competition over water resources intensified significantly. The persistent presence of nationalism, as well as political and economic rivalry among the five post-Soviet states, further complicated the situation and hindered the development of an effective regional approach. Taking into account the continuous nature of these challenges and drawing on water war theory, many scholars have argued that relations among these five states have increasingly shifted toward conflict rather than cooperation[10].

Nevertheless, in recent years, mutual cooperation and integration among the Central Asian states have significantly intensified. Numerous consultative meetings have been held among the five states with the aim of jointly addressing existing challenges and promoting regional integration. The initiative proposed by the President of the Republic of Uzbekistan, Shavkat Mirziyoyev, to transform the region into a "Central Asian Community" demonstrates the growing level of cooperation within the region.

Hydraulic Civilization in Central Asia

From the earliest times, due to the natural climatic conditions of Central Asia, the daily life of indigenous peoples was closely connected with artificial irrigation systems. According to archaeological excavations in Fergana, Zarafshan, Syrdarya valleys and the Khorezm oasis, the emergence of irrigation-based agriculture in Central Asia dates back to the Bronze Age. The development of the irrigation system in Central Asia is analyzed in three main stages. The first stage is the period of the emergence of the first knowledge of the irrigation system, which covers a long period from the Neolithic period to the beginning of the Iron Age. The first knowledge of the irrigation system of this period includes the use of open irrigated agriculture and the diversion of excess water to other low-lying areas to prevent flooding. The second stage includes the invention and development of water distribution devices and systems in the middle of the first millennium BC. According to archaeological research, it was during this period that the first states were formed in Central Asia, and agricultural lands based on artificial irrigation expanded significantly. The final third stage corresponds to the early and advanced periods of the Middle Ages, and during this period the artificial irrigation system developed at a professional level.

The knowledge and experience accumulated during the captivity allowed the local population to build water structures that would allow maintaining the water balance and controlling the flow rate in different situations.

[10] José Antonio Peña-Ramos, Philipp Bagus and Daria Fursova (2021) Water Conflicts in Central Asia: Some Recommendations on the Non-Conflictual Use of Water https://www.mdpi.com/2071-1050/13/6/3479

Over the years, engaging in agricultural activities based on artificial irrigation created a hydraulic civilization in this region and made it possible to irrigate millions of hectares of land between the Amu Darya and the Syr Darya [11].

The Cotton Policy of the Russian Empire in Central Asia and Its Consequences

In the second half of the nineteenth century, supplying the rapidly growing Russian industry with cheap raw materials became increasingly important. Central Asia, due to its natural climate, was considered a geographically favorable region for cotton cultivation. The need to supply the textile industry with inexpensive and high-quality cotton was one of the key factors motivating the Russian Empire's conquest of Central Asia. Following the conquest, the Russian Empire introduced new technologies in order to expand cotton-growing areas. In its continuous efforts to enlarge cotton fields, the empire diverted as much water as possible from the Amu Darya and Syr Darya rivers for agricultural use. In the Fergana Valley alone, the area under cotton cultivation increased nearly sixfold between 1880 and 1890 [12]. However, due to the incomplete and poorly developed irrigation infrastructure, nearly half of the water failed to reach the fields. The Russian Empire was primarily concerned with supplying its textile industry with raw materials, a policy that produced severe negative consequences. The extensive diversion of river water for irrigation significantly reduced the volume of water flowing into the Aral Sea. Once considered one of the largest inland seas in the world, the Aral Sea had already shrunk considerably by 1960, and this process continued uninterrupted. Between 1960 and 1987, the amount of water flowing into the sea from the rivers declined to nearly zero. While the surface area of the Aral Sea was approximately 68,000 km² before 1960, it had decreased by nearly 60 percent by 1987[13]. The cotton policy pursued by the Russian Empire caused serious damage to the region. The fishing industry that once existed in the Aral Sea collapsed entirely as a result of increasing salinity, and the extensive use of chemical substances in agriculture significantly reduced soil fertility.

The Continuing Water Crisis and the Five Post-Soviet States

With the collapse of the USSR in 1991, five countries with incomplete borders emerged in Central Asia. These five post-Soviet states: Uzbekistan, Kyrgyzstan, Kazakhstan, Tajikistan and Turkmenistan, have many unresolved issues and have faced many economic and political challenges since independence. Along with the division of borders, the fragmentation of common water and energy systems has created an urgent need for new agreements and common legislation. Initially, on October 10-12, 1991, the ministers of five independent states met in Tashkent and adopted a "Statement". The statement recognized that water problems in the region can only be solved through coordination and joint actions. Much later, on February 18, 1992, in Almaty, the Ministers of Water Resources

[11] Alisher Akhmadjonovich Alokhunov (2021) On The Study Of Ancient Irrigation Systems In Central Asia

https://theamericanjournals.com/index.php/tajssei/article/view/3377

[12] Bakhodir Meylikovich Khalikov(2023) The History of Cotton Farming in Uzbekistan , page 13
https://www.researchgate.net/publication/375231905_The_History_of_Cotton_Farming_in_Uzbekistan

[13] Behzod Gaybullaev, Su-Chin Chenh, Dilmurod Gaybullaev (2012) Changes in water volume of the Aral Sea after 1960
https://link.springer.com/article/10.1007/s13201-012-0048-z

of the five states signed the "Agreement on Cooperation in Joint Management, Use and Protection of Interstate Water Resources"[14]. However, these transboundary principles and documents produced did not produce sufficient results. There were political, economic, social, technological, climatic and even legal reasons for this ineffectiveness.

Central Asia has faced difficulties in solving the common water problem due to the existence of several political conflicts and border issues between the countries. Central Asia has an uneven distribution of water resources, Central Asia is divided into upstream (Kyrgyzstan, Tajikistan) and downstream (Kazakhstan, Uzbekistan and Turkmenistan) countries. For this reason, countries have a tendency to "link water-related issues to security", elevating them to the level of national security. According to the ministries, decentralization of water resources management increases the likelihood of conflict and, in turn, reduces the possibilities of regional cooperation[15]. Also, agriculture has always been considered important in the economies of Central Asian countries, especially for downstream countries, it was necessary to supply agriculture with water. Every winter, upstream countries are forced to release water for electricity generation due to insufficient energy supply for the population. However, downstream countries rely on storing water in winter and releasing it in summer for irrigation. Uzbekistan is the largest water consumer in Central Asia and has demanded that the Kyrgyz government release water from the Toktogyl reservoir during the summer months. In turn, Kyrgyzstan, unable to pay for the gas it consumed on time, decided to release water to generate electricity in the winter. As a result, the Toktogyl regime change resulted in the flooding of residential areas and land in the Fergana Valley. Also, the Tajik government's resumption of the Rogun power station project has been strongly opposed by the Uzbek government for many years[16].

Moreover, the population of Central Asia is growing very rapidly, which further complicates the water problem(Table 1). The total annual flow of the Amu Darya and Syr Darya, which provide the main drinking water for this region, amounts to 110 cubic kilometers. Over the last 20 years, the population in this area has grown rapidly, and their annual water consumption reaches 100–105 cubic kilometers. This means that the limits of water use have already been reached, and the lack of alternative water sources indicates the seriousness of the situation[17]. With population growth, the demand for water for drinking, agriculture, and energy continues to increase. Technological and natural factors also make cooperation in Central Asia difficult. Water distribution technologies in this area are very outdated and complex, leading to the loss of a significant portion of water. For example, in Uzbekistan, the main consumer country, 40% of water used for farming is wasted due to outdated technologies[18].

[14] Yegar Volovik (2011) Overview of regional transboundary water agreements, institutions and relevant legal/policy activities in Central Asia https://www.cawaterinfo.net/bk/water_law/pdf/water-agreements-in-central-asia-2011.pdf

[15] Beatrice Mosello (2008) Water in Central Asia: A Prospect of Conflict or Cooperation? https://share.google/PB3DDmHdfaPRONBAb

[16] Barbara Janusz-Pawletta et Mara Gubaidullina (2015) Transboundary Water Management in Central Asia https://journals.openedition.org/asiecentrale/3180

[17] Alla V. Vavilina, Tatiana V. Komarova, Anna A. Firsova (2025) Study of Freshwater Resource Availability for Socio-Economic Sustainability in the World https://www.wseas.com/journals/ead/2025/a105115-001(2025).pdf

[18] Rustam Muxammatdjonovich Raximov (2024) Solving water resources problems - water saving in the republic of uzbekistan the republic of uzbekistan page 21 https://btstu.researchcommons.org/journal/vol2024/iss1/4/

Climate change and a 90% reduction in the volume of the Aral Sea have also exacerbated the problem(picture 1). As the Aral Sea dries up, dust particles contaminated with salt, pesticides, and chemicals are dispersed by the wind. These dust particles cause many respiratory diseases in humans. However, for some countries, problems such as economic development and infrastructure are prioritized over ecology. As a result, the actions for cooperation are not uniform. Another major obstacle is the issue of international law. Management of transboundary waters should be based on a solid international legal framework. In the case of Central Asia, this requires the development of sustainable interstate legal cooperation based on principles and instruments derived from international water law. According to international legal standards, water management in Central Asia should be carried out based on the development, use, protection, distribution, quality, and quantity of water. Since the management of transboundary rivers is a complex issue, international water law should be based on treaties and water laws. Management of transboundary rivers requires the application of the basic principles reflected in many international water law treaties and customary water laws. The most important are: the principle of fair and rational use of water, the principle of "no significant damage," and the principles of cooperation[19].

These principles are currently applied within the limited legal framework of transboundary interstate cooperation.

These three principles define the rights and obligations of states beyond navigation on international rivers. However, the process of applying and observing these principles among the states of Central Asia has not yet fully formed.

The reasons mentioned above and analyzed based on the PESTEL model explain why after independence, these five post-Soviet states faced difficulties in mutual cooperation and solving the water problem.

Regional Cooperation and Integration

Despite the persistence of the above-mentioned problems and their negative significance, with the intensification of demographic changes in Central Asia in recent years, international partnership has also been strengthened. Recent changes in Central Asian policy demonstrate a significant increase in trust between these five countries. The awareness that these five countries are one nation, that they share the same historical and cultural origins, and that any problem can be solved if they unite, has strengthened. The role of the Central Asian community is especially important in these efforts. In recent years, they have not been limited to waiting for international initiatives. Rather, they are taking the initiative and emerging as regional political actors. In other words, Central Asia is transitioning to a model of collective responsibility for water issues. Currently, many seminars are being held in Central Asia aimed at strengthening cross-border water cooperation, and they are coming up with new initiatives. For example, on March 28, 2025,

[19]Attila Tanzi(2000) The Relationship between the 1992 UNECE Convention on the Protection and Use of Transboundary Watercourses and International Lakes and the 1997 UN Convention on the Law of the Non Navigational Uses of International Watercourses, Article 2(2) (c), Article 2(1), Article 2(6). https://www.unece.org/fileadmin/DAM/env/water/publications/documents/conventiontotal_Eng_final.pdf

a seminar on the "Blue Peace Central Asia" initiative was held in Tashkent. The main goal of this was to determine the strategic stage of the "Blue Peace Central Asia" initiative, BPCA 2.0, for 2025-2029[20]. Also, on November 16, the seventh Consultative Meeting of the Heads of State of Central Asia was held under the chairmanship of the President of the Republic of Uzbekistan Shavkat Mirziyoyev. In connection with the growing problem of water scarcity in the region, during the meeting, the President of Uzbekistan proposed to declare 2026-2036 the "Decade of Practical Actions on Rational Water Use in Central Asia." He emphasized the expediency of inviting Afghanistan to meetings to discuss the joint use of water resources [21]. The implementation of such initiatives indicates a significant improvement in relations between the states of Central Asia and the search for new ways to solve problems. If the strengthening of ties between the Central Asian states continues in this way, and if entrepreneurship increases, the water problem can certainly be solved. Because these five states are historically and ethnically interconnected states that have prospered this land for many years and can repeat this once again.

Conclusion

Nature and climate of this region allowed the local population create the hydraulic civilization. Over the years, by using artificial irrigation in agriculture, they achieved to construct well-developed water structures that helped to irrigate millions of hectares of land between the Amu Darya and Syr Darya. For more then 3500 years, local people had used water resources efficiently for both drinking and agriculture; however, the Russian Empire's annexation of this territory fundamentally changed the situation. Due to the cotton policy pursued by the Russian Empire, the main part of water was allocated for cotton cultivation, causing serious damage to this region. Also, the extensive use of chemical substances in agriculture dramatically reduced soil fertility and the fishing industry completely disappeared in consequence of increasing salinity. Even though the USSR collapsed in 1991 and five new countries emerged in Central Asia, the water problem remained unsolved. The five post-soviet countries, that recognized the seriousness of the issue, attempted to resolved it. Even so, there were significant obstacles to address this issue and they were analyzed based on the PESTEL model. The results show that solving this problem depends not only on the joint actions of states, but also on taking into account economic, political, and legal issues in this region. However, because of recent changes in Central Asian policy, the role of the Central Asian community is increased and they stated to prefer collaboration instead of pursuing work on one's own. based on the examples cited above, it can be said that it is an achievement of the five states that, no matter how serious this problem may be, they are acting with the understanding that the only way to solve it is through unification. Therefore, these states, which have been one nation for many years and are historically connected, can once again protect the nature of this region and the Aral Sea from extinction.

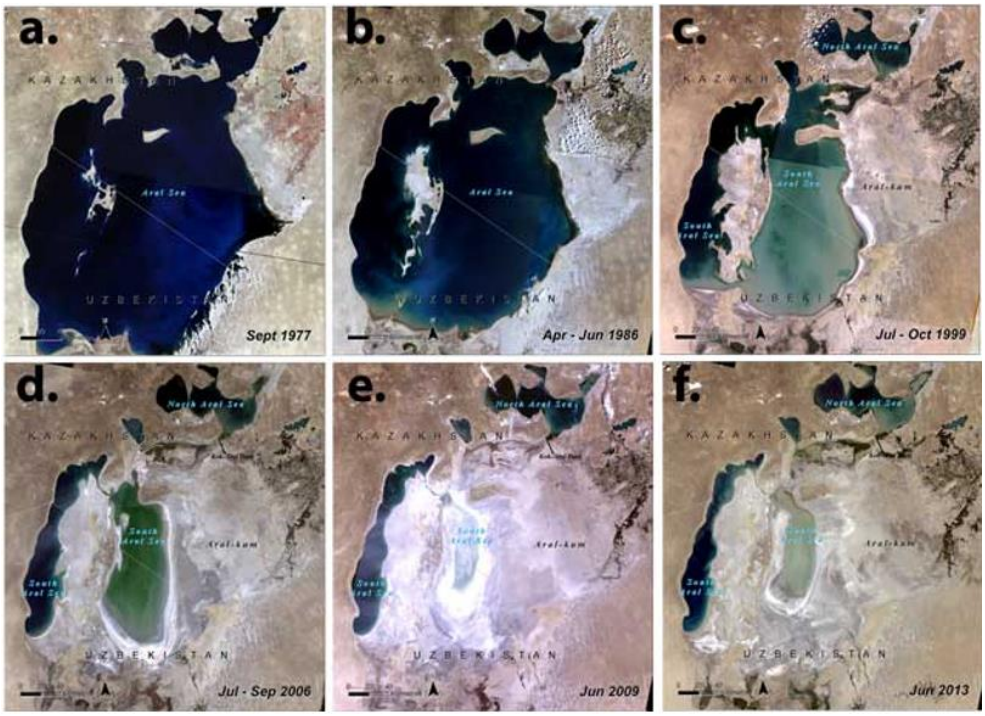
	1990	2000	2010	2020

[20] https://www.bluepeace-centralasia.ch/materials/-blue-peace-34235235

[21] https://president.uz/oz/lists/view/8675

UZBEKISTAN	20,464,956	24,787,054	28,385,506	33,586,372
KAZAKHSTAN	17,154,054	15,501,103	16,836,810	19,482,117
TAJIKISTAN	5,398,768	6,284,735	7,652,141	9,749,310
KYRGYSZTAN	4,391,236	4,898,362	5,467,059	6,726,596
TURKMENISTAN	3,760,562	4,582,677	5,564,356	6,949,912
TOTAL	51,169,576	56,053,931	63,880,872	69,552,256

The Population growth in Central Asia according to World Bank Group.



Images show existent of the Aral Sea from 1997 to 2013.
https://share.google/Ab5fNQ0NObx1u2azn

REFERENCES:

1. Bakhodir Meylikovich Khalikov(2023) The History of Cotton Farming in Uzbekistan https://www.researchgate.net/publication/375231905_The_History_of_Cotton_Farming_in_Uzbekistan

2. Peña-Ramos, J.A. The Impact of Russian Intervention in Post-Soviet Secessionist Conflict in the South Caucasus on Russian Geo-energy Interests. Int. J. Confl. Violence 2017, 11, 1–13.

3. ENVSEC. Environment and Security in the Amu Darya Basin, UNEP, UNDP, UNECE, OSCE, REC, NATO. 2011, p. 14. http://www.cawater-info.net/library/eng/amudarya-envsec-en.pdf

4. Homer-Dixon, T.F. On the threshold: Environment changes as causes of acute conflict. Int. Secur. 1991, 16, 76–116.

5. Pulatov, J. (2025). KOREYA RESPUBLIKASI VA KOREYA XALQ DEMOKRATIK RESPUBLIKASI: O'TMISH, BUGUN VA KELAJAK. THEORY AND ANALYTICAL ASPECTS OF RECENT RESEARCH, 3(32), 83-85.

6. Pulatov, J. (2025). FOREIGN POLICY INSTRUMENTS OF THE REPUBLIC OF KOREA. SUSTAINABILITY OF EDUCATION, SOCIO-ECONOMIC SCIENCE THEORY, 3(26), 123-125.

7. Pulatov, J. (2023). ILMIY ISH VA TADQIQOT OLIB BORISHDA FOYDALANILADIGAN USLUBLAR. Scientific Impulse, 1(12), 252-255.

8. Gleason, Gregory. 2001. Inter-state Cooperation in Central Asia from the CIS to the Shangai Forum. Europe-Asia Studies 53,7

9. Micklin, Philip. 1986. Water Diversion in the Soviet Union. Science, New Series 234,4775, October.

10. Ziganshina D., 2011, The Role and Relevance of the UN Watercourses Convention to the Countries of Central Asia and Afghanistan in the Aral Sea Basin, International Water Law Projecthttps://www.internationalwaterlaw.org/blog/category/central-asia/