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WATER DIPLOMACY IN ADDRESSING EXTERNAL AND INTERNAL THREATS AND CHALLENGES FOR KAZAKHSTAN IN THE CONTEXT OF THE APPLICATION OF EUROPEAN WATER DIRECTIVES

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ABSTRACT

Objective: This article aims to provide a comprehensive analysis of water diplomacy institutions in Kazakhstan and Central Asia, comparing them with European water management directives, focusing on transboundary governance as a key element of regional stability and security.

Method: An interdisciplinary methodology was employed, combining structural, historical, logical, and multidimensional approaches. Comparative, statistical, and causal analyses were used, along with expert assessments and data monitoring. Case studies such as the Rhône River and the Aral Sea crisis were examined as comparative frameworks.

Results: The study reveals that water scarcity and fragmented governance structures create significant vulnerabilities in the region. The absence of comprehensive multilateral agreements and Afghanistan's exclusion from cooperation mechanisms heighten water-related risks. The Rhône River case illustrates how water governance can shift from conflict-prone systems to sustainable models. The Kush-Tepa Canal project is identified as a new potential source of regional tension.

Conclusion: Water diplomacy plays a critical role in ensuring regional stability in Central Asia. Multilateral cooperation and the adoption of EU-inspired legal frameworks are essential for sustainable and effective water governance. The study recommends strengthening institutional mechanisms and implementing integrated regional planning to preserve Kazakhstan's and the region's water security.

Keywords: Central Asia; Water diplomacy; Water regulation; Rhône River; Energy.

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A DIPLOMACIA DA ÁGUA NA ABORDAGEM DE AMEAÇAS E DESAFIOS EXTERNOS E INTERNOS PARA O CAZAQUISTÃO NO CONTEXTO DA APLICAÇÃO DAS DIRETRIZES EUROPEIAS SOBRE A ÁGUA

RESUMO

Objetivo: O artigo busca analisar de forma abrangente as instituições de diplomacia da água no Cazaquistão e na Ásia Central, comparando-as com as diretrizes europeias de gestão de recursos hídricos, com foco na governança transfronteiriça como elemento chave para a segurança e estabilidade regional.

Método: Foi adotada uma abordagem interdisciplinar com métodos estruturais, históricos, lógicos e multidimensionais. Utilizaram-se também análises comparativa, estatística e causal, além de avaliações de especialistas e monitoramento de dados. Casos como o do rio Rhône e a crise do Mar de Aral foram analisados como estudos comparativos.

Resultados: O estudo evidenciou que a escassez de água e a governança fragmentada geram vulnerabilidades regionais. A falta de acordos multilaterais robustos e a ausência de cooperação com países como o Afeganistão ampliam os riscos hídricos. O exemplo do rio Rhône demonstra como a regulação pode evoluir de conflitos para modelos sustentáveis de gestão. O artigo também destaca o canal Kush-Tepa como nova fonte de tensão regional.

Conclusão: A diplomacia da água é essencial para garantir estabilidade na Ásia Central. A cooperação multilateral e a adoção de estruturas legais inspiradas em modelos europeus, como as diretrizes da UE, são fundamentais para a governança eficiente e sustentável dos recursos hídricos. O fortalecimento institucional e o planejamento regional integrado são caminhos recomendados para a preservação da segurança hídrica no Cazaquistão.

Palavras-chave: Ásia Central; Diplomacia da água; Regulamentação da água; Rio Rhône; Energia.

1 INTRODUCTION

The recognition of the crucial importance of water resources and their social significance in the context of human rights to safe and clean water has become the foundation for addressing the issue of water security. To preserve this limited and valuable natural resource for present and future generations, it is essential to find ways to improve the efficiency of transboundary river and reservoir regulation. The situation is exacerbated by inefficient water use, the deterioration of irrigation infrastructure and water conservation systems, and other related challenges. Currently, a shift in the water management policies of Central Asian (CA) countries is emerging, with a growing emphasis on strengthening cooperation to address key challenges, despite certain localized border conflicts in 2020–2021 (Vinokurov et al., 2022).

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2 RESEARCH BACKGROUND

The analysis of this issue will be based on previous studies on water resource management in the region and CA countries. All major rivers in the Central Asian region (CAR) are transboundary. The primary water sources in the region are the Syr Darya and Amu Darya rivers, which flow through multiple countries, including Tajikistan, Afghanistan, Uzbekistan, and Turkmenistan. These rivers provide approximately 77 km³ of water, with 96% of it used for irrigation. Additionally, other significant intergovernmental rivers such as the Chu, Talas, Tarim, and Irtysh also flow through the region (Kukushkina & Sodikov, 2018).

Of the five CA countries, only Kyrgyzstan has water resources formed exclusively within its territory, while the other countries rely to varying degrees on water inflows from neighboring territories. The situation is particularly complex for Uzbekistan and Turkmenistan, as nearly 90% of their renewable water resources come from external sources.

Kazakhstan, as a country dependent on transboundary water resources, prioritizes the efficient use of these rivers. However, water resources within Kazakhstan are unevenly distributed. The highest water reserves are concentrated in the East Kazakhstan region—290,000 m³ per km² - while Atyrau, Kyzylorda, and especially Mangystau regions face acute freshwater shortages, with almost no natural water sources available (Pulatov & Mukhabbatov, 2021).

Kazakhstan's economic development, both at the national and regional levels, is significantly influenced by water availability. Given that nearly half of the country's required water supply comes from outside its borders, water plays a critical role in its international relations with neighboring states.

These natural and geopolitical factors objectively necessitate regional integration and joint river basin management based on international law. The lack of regulation in the shared use of water resources among CA countries severely limits the potential for regional economic integration, affecting trade, transportation, and labor markets. This results in high transaction costs and hinders progress towards achieving the Sustainable Development Goals (SDGs) (United Nations, 2017). Therefore, it is essential to develop practical recommendations and proposals for reforming the water sector in CA to ensure the most effective use of limited water resources from the perspective of national interests, environmental priorities, and SDG commitments. This will help maintain regional stability and security, taking into account historical practices of water-energy resource management,

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existing governance structures, and international experience.

2.1 Justification of scientific novelty

This research aims to conduct a systematic and comprehensive analysis of water resources in CAR, their formation, intergovernmental distribution, and water management practices. The study will result in recommendations for addressing water shortages in CA countries through the lens of national and regional interests. The article's strategy focuses on exploring potential climate change scenarios in the near future and their impact on regional water resources, water management practices in CA, the role of state and international organizations in addressing water challenges, legal frameworks for water conservation and usage, and the potential for economic growth and job creation in the water sector.

A novel aspect of this project is the compilation of all existing climate change scenarios and forecasts of their impact on water resources, as well as an analysis of the full spectrum of water management experiences in CA. The study will clearly define the role of states, regional bodies, and international organizations in addressing water-related issues, considering current techno-economic and socio-political processes.

2.2 Review of previous studies

The management of water resources and water-energy security has been extensively studied by both domestic and international researchers.

Scholars such as J. Barnett (2001), G. Dabelko, and D. Dabelko (1995), G. Prins (1993), and R. Kaplan (1994) argue that economic issues are integral to national security and that neglecting them can lead to severe consequences, including military conflicts.

A significant contribution to the study of the relationship between ecology and resource conflicts was made by Canadian scholar T. Homer-Dixon (1998, 1999), whose views are echoed in the works of A. T. Wolf and J. Hammer (2000) from Oregon University, as well as K. A. Scott and B. Tapa (2019).

The role of water resources in shaping regional geopolitics has been explored by M. Zeitoun and J.A. Allan (2008) and M. Zeitoun and J. Warner (2006), who highlight the direct influence of water control on regional stability. Numerous scholars have also examined the effects of climate change on water availability in CA (Chen et al., 2017; Hoegh-Guldberg & Poloczanska, 2017; Lacoue-Labarthe et al., 2016; Prasadet al., 2017).

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The development of cooperation within CAR is discussed in the works of E. Wainthol (2002), S. Ohara (2000), S. McKinney (2003), and E. Sievers (2002). Researchers have also analyzed the environmental disaster of the Aral Sea, its causes, and its consequences (Glenn, 1999; Micklin, 2000; O'Neill, 2003).

Russian scholars have explored a broad range of issues concerning transboundary rivers, from legal aspects to the rational use of water resources by end users (Borisova, 2015; Danilov-Danilyan & Khranovich, 2010; Shevtsov, 2015). Notable research includes studies on water as a crucial factor in international relations (Likhacheva, 2015), as well as works by N. G. Rogozhina (2015) and O. A. Boyarkina (2017), which examine water resource management in the context of intergovernmental, national, and regional challenges.

Central Asian researchers have also made significant contributions. Uzbek scholars (Abdullaev & Akhmetov, n.d,; Dukhovny & de Schutter, 2011; Mirzaev, 2012) argue that integrated water resource management is an effective approach to solving local issues. Their studies predict future cooperation scenarios in CA's water sector (Paramonov et al., 2017; Rakhimov, 2011). Tajik researchers have analyzed the ecological state of Central Asian waters (Khonaliev, 2013; Kimsanov, 2013) and addressed fair and efficient transboundary water use (Saidov, 2017; Zoidov & Medkov, 2015).

There are relatively few studies from Turkmenistan, but existing research explores the use of alternative water sources in desert and semi-desert areas (Babaev, 2008). Some of the first comprehensive studies on shared water use in CA were conducted by Kyrgyz researchers (Valentini et al., 2004). Their work primarily focuses on the agricultural, economic, and environmental aspects of water resource utilization (Alamanov, 2015) and, more recently, on the transformation of water-related disputes into conflicts and cooperation strategies (Garbuzarova, 2017).

In a dissertation by A. V. Cherednichenko (2010), Kazakhstan's adaptation to climate change—linked to global warming—is explored through the use of convective cloud seeding as a means of increasing available water resources during drought periods.

Kazakhstani scholars have thoroughly examined the shared use of water resources, with notable contributions in the books of Kazakhstan's first president, N. Nazarbayev (2011, 2017). Environmental security and global implementation experiences have been analyzed by G. Baykushikova (2017), while water management of transboundary rivers in CA has been extensively studied (Kukeeva & Ormysheva, 2015). T. A. Ormysheva (2019) has conducted a comprehensive analysis of transboundary water issues in CA, considering both

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national and regional perspectives.

It is evident that the perspectives of scholars on this issue are significantly influenced by evolving international relations. Given the rapidly changing global landscape, a fresh perspective on water diplomacy at both national and regional levels is required.

2.3 Scientific needs

This research aims to:

- Establish links between climate, demographic, and migration processes and the water crisis in CA;
- Identify the most successful attempts to regulate water management issues in the region;
- Determine the role of states, regional, and international organizations in addressing water challenges within the current techno-economic and socio-political context of CA;
- Reflect on ways to improve the legal regulation of water relations in CAR, incorporating international experiences;
- Highlight opportunities for economic growth, job creation, and service expansion in Kazakhstan's water sector.

Moreover, practical solutions and starting points for enhancing regional cooperation will be proposed. Pragmatic approaches exist for many challenges, and joint research and planning can enable stakeholders to develop mutually beneficial strategies. The core idea of this project is that cooperation should be a practical implementation of shared benefits for all parties. Every joint decision made will strengthen positive feedback loops, building trust and expanding the scope of collaboration.

3 RESEARCH METHODS

3.1 Methodology

The study will employ a structural approach to identify the nature of interactions between various social and legal institutions. The project's framework is based on principles of historical synthesis, logical and multidimensional analysis, and the interplay of subjective and objective factors. Additionally, systematic analysis will be applied to assess the development of transboundary water cooperation in Central Asia (CA), ensuring a comprehensive and critical evaluation of factual data. This necessitates an interdisciplinary

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approach, integrating theoretical, source-based, and instrumental methodologies.

The research will also utilize comparative, statistical, and cause-effect analysis methods, along with monitoring techniques, probabilistic forecasts, and expert assessments. The analysis of official documents will facilitate an understanding of the evolution of cooperation among CA countries in addressing water resource challenges.

A key aspect of this study is the development of a methodological framework for creating coordinated water management strategies in uncertain conditions. This approach considers not only the actual volumes of water resources but also their guaranteed thresholds, representing virtual resources that influence the functioning of hydraulic and related systems. This enables the adaptation of water management strategies to potential environmental and geopolitical shifts in CA.

3.2 Approach and relevance

The project is built upon principles of historical and logical unity, detailed analysis, multidimensional evaluation, and the balance between subjective and objective factors. It involves both theoretical research and critical examination of factual material, which justifies the interdisciplinary approach applied in the study. Given the complexity and significance of water diplomacy, further research is required to explore new areas and unresolved challenges in the field.

The importance of defining methodological principles is dictated by the current situation, where water resource management involves multiple stakeholders in both the public and private sectors. A key objective is to establish a constructive framework for shared responsibility, encouraging all parties to develop coordinated solutions.

At present, there is a pressing need to train young specialists with expertise in water management and conservation, enabling them to make complex decisions that ensure the sustainable development of the water sector. This requires an efficient and rational approach, responsible attitudes, and collaborative efforts in regional cooperation on water governance and preservation. A crucial aspect of this process is defining water diplomacy institutions in the transboundary management of water resources, as a key factor in regional stability and security in CA.

3.3 Historical and political context

A historical analysis will help uncover the origins of the current water resource situation

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in CA. Water scarcity has historically been a major challenge for regional development. Modern political and economic approaches to water governance and security in CA largely depend on the region's current economic landscape. The shared goal of all five CA countries to foster economic growth and national development may also positively impact future water security and regional planning.

Analytical Tools and Forecasting

Key research methods include:

- Comparative analysis – to assess the current distribution of water among CA countries and derive relevant conclusions.
- Water resource monitoring – a method designed for water management specialists to evaluate and regulate water resources. The results of this method can aid in decision-making for Kazakhstan's and CAR's water management bodies.
- Expert forecasts – to identify possible climate change scenarios and their impact on regional water resources, providing insights for adaptation strategies.
- Document analysis – to examine the development of international cooperation in addressing water resource challenges in the region.

3.4 Multilateral cooperation mechanism

The study advocates for a multilateral regional mechanism for river flow regulation, which is more realistic and practical than bilateral approaches. It is evident that a multilateral framework will lead to fairer and more effective water management solutions compared to bilateral agreements, which lack a holistic regional perspective.

Given that CA is facing a water crisis combined with high environmental vulnerability, a multilateral mechanism presents itself as the most sustainable and viable long-term strategy for the region.

4 RESULTS

4.1 International water law and transboundary cooperation

International water law governs the protection and use of transboundary rivers, lakes, and aquifers. Over 150 countries worldwide share transboundary water bodies, making it crucial to establish transparent and predictable frameworks for their rational distribution.

The history of international water law dates back to 2450 BCE, when the first

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agreement on joint water use was signed. Early treaties were typically one-time agreements, often concerning navigation or border delimitation. However, modern agreements tend to adopt a comprehensive approach, covering entire basins and promoting transboundary water cooperation.

A key challenge in expanding the scope of agreements on transboundary rivers, lakes, and aquifers lies in the nature of international law as a consent-based system. Countries must recognize the benefits of entering into such agreements, as no supranational authority can compel states to adopt specific legal frameworks.

In practice, there are global conventions such as the 1992 Water Convention and the 1997 UN Watercourses Convention. These documents establish fundamental principles and guidelines that countries can adopt as a foundation for their national and intergovernmental legislation on specific rivers, lakes, and aquifers. However, the ultimate decision to cooperate on transboundary water management rests with individual states, based on their perceived benefits.

4.2 Water disputes and conflict risks

It is difficult to assert that water-related disputes are a primary cause of conflicts. Various factors determine whether disagreements over water escalate into tensions or even violent conflict.

The link between water and conflicts is often indirect, unlike domestic disputes, where causes tend to be clearer and more straightforward. In international relations, an upstream country may initiate a dam, water diversion, or agricultural project, but lack an agreement on mitigating its consequences. This often provokes reactions from downstream countries, raising tensions. However, these very tensions frequently serve as catalysts for cooperation by attracting international attention, financial resources, and diplomatic efforts.

For example, tensions over the Nile, Central Asia, and Switzerland have arisen due to large upstream projects, often involving dam construction. While such projects generate headlines and conflict predictions, they also mobilize international resources to address water disputes through cooperation rather than conflict.

4.3 Case study: The Rhône River

The Rhône is an international river shared between Switzerland and France. It originates in the Swiss Alps and flows to the Mediterranean Sea, with significant hydrological

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variations along its course. The river includes mountain streams, agricultural plains (e.g., Valais), and large infrastructure zones near Geneva.

An examination of the evolution of Rhône governance highlights three key periods:

1. 1870–1970: The river was seen as a production tool, with emphasis on hydropower and industrial development. The Seissel Dam in France symbolized this approach, as reflected in its inscription: "Rhône at the service of the nation." After World War II, 2% of France's Marshall Plan funds were directly invested in Rhône hydropower infrastructure, making it a symbol of modernization and energy autonomy.
2. 1970–2000: The rise of nuclear energy in France led to the construction of nuclear plants along the Rhône, using its water for cooling. This introduced cross-border environmental concerns, as a nuclear accident would affect both Swiss and French territories. Consequently, cooperation intensified, leading to strict environmental regulations and the integration of EU water directives into national laws.
3. 2000–Present: The implementation of EU water directives has further transformed Rhône governance. The focus has shifted from exclusively energy production to restoring the river's natural state, balancing hydropower flexibility with environmental sustainability.

This case study illustrates how initial tensions over water use can evolve into long-term cooperation through regulatory frameworks and international agreements.

4.4 Case study: Central Asia and the Aral Sea crisis

Central Asia, characterized by an arid climate, relies heavily on two major rivers: Amu Darya and Syr Darya. These rivers traverse all Central Asian Republics (CAR) and sustain the remnants of the Aral Sea (i.e., the Small Aral Sea).

Approximately 60–70 years ago, the Aral Sea was the fourth-largest lake in the world, home to 34 fish species across four Soviet republics and Iran. The region's hydraulic system expanded during large-scale irrigation projects, particularly under the "Development of the Hungry Steppe" initiative in Soviet Turkestan.

However, centralized Soviet water management prioritized irrigation and hydrological expansion without water usage fees. As a result, even with distribution quotas, the Aral Sea was unsustainable. The consequences of mismanagement led to a 90% loss of the sea.

Today, the region faces a complex water crisis:

- Growing water demands for energy, agriculture, and domestic use.

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- A rising population amid harsh climate conditions.
- Severe water pollution affecting human health.

Key Water Challenges in CAR

1. Legal and Institutional Gaps – There is no comprehensive legal framework governing transboundary water relations among CA countries.
2. Water-Energy-Agriculture Nexus – The region struggles to balance competing demands for water.
3. Environmental Degradation – Pollution and inefficient water use exacerbate water shortages.

The study highlights the complexity of transboundary water management and the critical role of international cooperation in preventing conflicts. Key takeaways include:

- International water law provides essential frameworks, but success depends on states recognizing mutual benefits.
- Water disputes often arise from large upstream projects, but these tensions can drive cooperation.
- Case studies of the Rhône and Central Asia illustrate the evolution of governance structures, from conflict-prone hydropower expansion to environmental sustainability.
- The Aral Sea crisis underscores the risks of mismanagement, emphasizing the need for institutional reforms in CAR.

Addressing legal, political, and environmental challenges will be crucial for achieving regional water security and sustainable development in Central Asia.

In the region, institutional cooperation among Central Asian Republics (CAR) is facilitated through the International Fund for Saving the Aral Sea (IFAS), which has been an intergovernmental organization for 30 years, helping countries reach agreements and making binding decisions, particularly on water distribution, which still requires improvement, especially in the energy and environmental sectors, to enhance the decision-making process.

The legal framework primarily consists of legal agreements signed in 1992–1993, which were ratified by all countries in the Aral Sea Basin. Some of these agreements are general in scope, while others focus specifically on water resources and energy in the Syr Darya basin. The only agreement with a broad focus on sustainable environmental development was signed in 2006. However, the region faces significant challenges in implementing international water law into regional agreements. It must be noted that existing

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agreements lack international principles, and the procedural cooperation mechanisms remain weak.

Looking at a global perspective, we can examine global transboundary agreements and multilateral environmental agreements and their application to the Aral Sea Basin. It is evident that these agreements apply, particularly major conventions such as the 1992 UNECE Water Convention. However, only Kazakhstan, Uzbekistan, and Turkmenistan, which are downstream countries, have adopted this convention. The 1997 UN Watercourses Convention has been signed only by Uzbekistan, and other multilateral environmental agreements related to biodiversity protection, wetland conservation, and climate remain underutilized in establishing a clear legal framework for managing the interconnected water-related elements of the region's environment.

At the regional level, there is the CIS Cooperation Organization, an independent Commonwealth of Independent States (CIS) platform. However, this entity plays a much smaller role in water regulation among Central Asian countries.

Another major challenge for Central Asian countries is the Kush-Tepa Canal, which is currently under construction in Afghanistan. Droughts and water shortages impact both upstream energy production and downstream irrigation. Furthermore, low water use efficiency, limited availability, and the potential negative effects of climate change on water resources contribute to an uncertain future for the region, intensifying competition for water across all sectors. The Kush-Tepa Canal adds another dimension to this issue, raising the stakes for regional stability.

Following the Taliban's rise to power in Afghanistan, construction of the Kush-Tepa Canal began in March 2022. The canal is a key development initiative for the Taliban, symbolizing post-American progress. It is designed as a major irrigation project, spanning 281 km in length, 100 meters in width, and 8 meters in depth.

Upon completion, the canal will divert approximately 650 cubic meters per second (or 13 km³ of water per year) from the Amu Darya River. The intake point is located on the main Amu Darya River at the Afghanistan-Tajikistan border. The canal passes through Balkh and Jowzjan provinces and connects to the Andkhoy Irrigation Canal in Faryab Province in northern Afghanistan. Additionally, it will facilitate water transport for the Andkhoy Irrigation Project, potentially irrigating between 550,000 and 585,000 hectares of land (1.35 million acres or 5,500 square kilometers) in these provinces once operational.

Given that Uzbekistan's economy is primarily dependent on agriculture, the operation of this canal is expected to increase pressure on the Amu Darya River, which in turn will put

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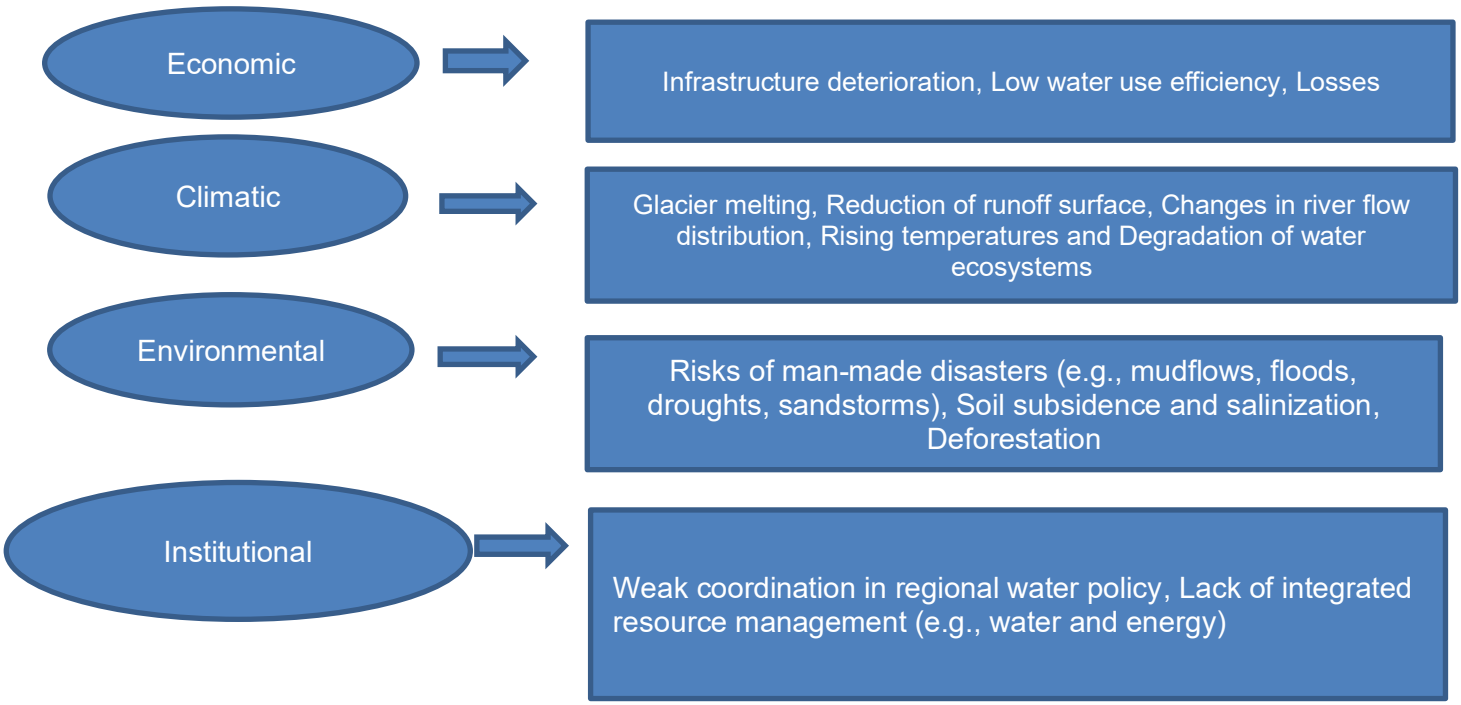
additional stress on the Syr Darya River. As a result, the overall water burden on both of Central Asia's major rivers is expected to rise.

Afghanistan is not a party to any interstate agreements and does not participate in water governance negotiations. The Amu Darya Basin accounts for approximately half of Afghanistan's renewable water resources. Due to the lack of infrastructure and water storage facilities, Afghanistan remains highly vulnerable to recurring droughts and floods. The expansion of Afghanistan's use of shared water resources has direct consequences for downstream neighbors, particularly Uzbekistan and Turkmenistan, which rely on over 83% of the basin's shared renewable water resources for agriculture.

The common water challenges of the region are illustrated in Figure 1.



Note: Compiled by the author based on the literature used

According to data from the Intergovernmental Panel on Climate Change, the rate of temperature increase in Central Asia is twice the global average. Projections indicate a temperature rise of 2–4 degrees Celsius by 2050 and 3–5 degrees Celsius by 2080. River runoff is expected to decrease by 10–30 percent, and the region will become drier, especially in the western parts of Turkmenistan, Uzbekistan, and Kazakhstan. Reduced water runoff and more frequent heatwaves will negatively impact crop yields and food security.

The current water distribution system of the Amu Darya River, based on the 1992 Almaty Agreement, must consider Afghanistan's potential future water use. The Kush-Tepa

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Canal challenges existing water usage practices and regional water-sharing procedures. Without cooperation with Afghanistan, the consequences for downstream countries—particularly those at the tail end of irrigation systems and the surrounding environment—could worsen. Climate impacts and uncertainties will exacerbate these issues, further destabilizing regional water distribution systems that encompass other riparian states.

It is important to note the main aspects of water resources in Central Asia: arid and enclosed basins; an agrarian economy where rural pollution remains significant; and a culture and way of life deeply dependent on water. In short, water is the key to sustainable development in Central Asia.

At the same time, shared water resources and transboundary water systems both unite and divide riparian countries. Despite a shared history of rivers, limited natural resources, and a fragile environment, the region is marked by competing economic systems. Water in Central Asia is the foundation of peace and security. To preserve peace, it is essential to strengthen regional cooperation, particularly institutional collaboration on a transboundary basin scale.

5 CONCLUSIONS

International cooperation on the distribution of transboundary water resources is highly complex. This complexity arises primarily from the numerous political, legal, and institutional frameworks in place. Additionally, it is due to the varying scales of intervention, ranging from local to international levels. Finally, the involvement of multiple actors, from local to international stakeholders, and the need for coordination add to this complexity. The challenge lies in defining the right or most suitable structure – one that promotes regional integration and is also legitimate for the various stakeholders involved. Ultimately, the decisions made by these actors must address existing needs.

The example of the Rhône River perfectly illustrates the transition from single-sector management to the concept of integrated water resource management at the international level. This trend reflects the incorporation of new uses as well as significant modifications to the river management system. Questions may arise regarding the concept of integrated water resource management for the Rhône. Three key developments are illustrated here. First, there was a spatial rethinking of river management, where different sectors and organizations began to compete for influence, losing monopoly positions and dominance over the system. Second, the Rhône River demonstrates the transition from monofunctional

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regulation to multifunctional management, marking the emergence of a new political agenda aligned with the concept or trend of integrated water resource management. Finally, the third phase, from 2000 to the present, shows increasing complexity as the institutional structure becomes more fragmented, new regulatory frameworks overlap, and the number of actors with multiple levels of intervention between borders grows, complicating the formation of a unified approach.

In the CAR, the Chu-Talas River Basin management serves as a good example, where a special intergovernmental convention was established, enabling cooperation between Kyrgyzstan and Kazakhstan. Although within limited technical boundaries, the two countries have been able to effectively implement bilateral cooperation.

Much like the Rhône River, the region's shared culture, language, and historical heritage, including water resource management, form a strong basis for sustainable integration. However, in terms of weaknesses, governance remains a challenge. There is a need to strengthen and modernize institutional cooperation to reflect the interests of all basin countries. Stakeholders must enhance the implementation of existing legal frameworks and improve them by adding principles and more advanced cooperation mechanisms, using developed countries as examples.

The scientific novelty proposed by the authors lies in conducting a systematic and comprehensive analysis and evaluation of CAR's water resources, their formation and interstate distribution, and water management practices. The study will result in recommendations to address water shortages in CAR countries through the lens of national and regional interests. The research will include examining potential climate change scenarios in the region in the near future and their consequences for regional water resources, exploring water sector management practices in CAR, and evaluating the role of state, regional, and international organizations in solving water-related problems. It will also address the legal regulation of water conservation and usage in CAR and explore the potential for economic growth, job creation, and service provision in the water sector.

The project's scientific hypothesis is that developing recommendations and proposals for reforming the water sector in CAR, taking into account national and regional interests, will ensure stability and security for the entire region.

EXPECTED RESULTS AND APPLICABILITY

The project aims to produce practical recommendations and proposals for improving

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water resource management in CAR based on key trends in national and regional water policy. The results can be used in further studies on water diplomacy among CAR countries. At the same time, the practical significance of the study lies in creating a dedicated platform involving experts to conduct seminars, international and regional conferences, and roundtables to discuss these issues. Additionally, a monograph titled "Water Diplomacy in Addressing External and Internal Threats and Challenges for Kazakhstan" will be published.

POTENTIAL BENEFICIARIES

This project may be of interest to foreign policy institutions of CAR countries in developing national and regional strategies for water resource management. The study's findings could also benefit analysts, non-governmental organizations, and those involved in training specialists in the water sector.

REFERENCES

Abdullaev, I., & Akhmetov, S. (n.d.). Policy brief: Impact of Afghanistan's water developments in the Amu Darya basin on Central Asia. The University World Economy and Diplomacy. Retrieved from https://iais.uz/storage/files/1/PolicyBriefCA-Afg_Water%20Developments.pdf

Alamanov, S.K. (2015). A critical look at the modern water policy of Central Asian countries. *Bulletin of the Diplomatic Academy of the Ministry of Foreign Affairs of the Kyrgyz Republic named after K. Dikombaev, 6*, 26-32.

Babaev, A.G. (2008). Alternative water supply sources for small consumers in Central Asia's deserts. *Problems of Desert Development – International Scientific-Practical Journal, 1*, 18-21.

Barnett, J. (2001).*The meaning of environmental security: Ecological politics and policy in the new security era*. New York: Zed Books, 192 p.

Baykushikova, G.S. (2017). *Environmental security issues in modern international relations: European experience for Central Asia: Monograph*. Almaty, 202 p.

Borisova, E.A. (2015). *Water and energy resources in "greater" Central Asia: Overcoming water deficit*. Moscow: URSS, 236 p.

Boyarkina, O.A. (2017). W*ater conflicts in global politics: Problems and perspectives: Monograph*. Moscow: Rusayns, 90 p.

Chen, J., McCarl, B.A., & Thayer, A. (2017). Climate change and food security: Threats and adaptation. *Frontiers of Economics and Globalization, 17*, 69-84. http://dx.doi.org/10.1108/S1574-871520170000017006

Submetido em: 10/10/2024
Aprovado em: 18/12/2024
Avaliação: Double Blind Review
ISSN: **2316-2880**

Cherednichenko, A.V. (2010). *Climate change in Kazakhstan and adaptation possibilities through available water reserves*: Dissertation for Doctor of Geographical Sciences. Institute of Geology named after M. M. Adyshev, Bishkek, 410 p.

Dabelko, G., & Dabelko, D. (1995). Environmental security: Issues of conflict and redefinition. *Environmental Change and Security Project Report, 1*, 3-13.

Danilov-Danilyan, V.I., & Khranovich, I.L. (2010). *Water resource management: Harmonizing water use strategies*. Moscow: Nauchny Mir, 232 p.

Dukhovny, V., & de Schutter, Y. (2011). *Water in Central Asia: Past, present, and future*. London: CRC Press, 466 p.

Garbuzarova, E.G. (2017). The water-energy dilemma of Central Asian states: Are armed conflicts possible? *Bulletin of KRSU, 17*(4), 40-44.

Glenn, J. (1999). *The soviet legacy in Central Asia*. London: Macmillan, 234 p.

Hoegh-Guldberg, O., & Poloczanska, E.S. (2017). Editorial: The effect of climate change across ocean regions. *Frontiers in Marine Science, 4*, 361. https://doi.org/10.3389/fmars.2017.00361

Homer-Dixon, T. (1998). Environmental security and mass violence. In *The geopolitics reader* (pp. 204-211). London: Routledge.

Homer-Dixon, T. (1999). *Environment, scarcity, and violence*. Princeton: Princeton University Press, 271 p.

Kaplan, R. (1994). The coming anarchy. *Atlantic Monthly, 273*(2), 44-76.

Khonaliev, N.Kh. (2013). Energy resources and energy security of the Republic of Tajikistan. In *Problems and prospects of economics and management: Materials of the II International scientific conference* (pp. 33-37). St. Petersburg: Renome.

Kimsanov, U.O. (2013). Ecological and resource-saving aspects of ensuring the water-energy security of the country. *Bulletin of the Technological University of Tajikistan, 1*(20), 72-76.

Kukeeva, F.T., & Ormysheva, T.A. (2015). Water problems in Central Asia: Case of Chu and Talas Rivers. *Bulletin of KazNU, 4*(72), 84-90.

Kukushkina, A.V., & Sodikov, Sh.D. (2018). The problem of the international legal status of water resources in Central Asia. *Zakon i pravo, 12*, 31-39. https://doi.org/10.24411/2073-3313-2018-10258

Lacoue-Labarthe, T., Nunes, P.A.L.D., Ziveri, P., Cinar, M., Gazeau, F., Hall-Spencer, J.M., Hilmi, N., Maschella, P., Safa, A., Sauzade, D., & Turley, C. (2016). Impacts of ocean acidification in a warming Mediterranean Sea: An overview. *Regional Studies in Marine Science, 5*, 1-11. http://dx.doi.org/10.1016/j.rsma.2015.12.005

Submetido em: 10/10/2024
Aprovado em: 18/12/2024
Avaliação: Double Blind Review
ISSN: **2316-2880**

Likhacheva, A.B. (2015). *Water scarcity as a factor in modern international relations*: Dissertation for Candidate of Political Sciences. Moscow State Institute of International Relations, Moscow, 219 p.

McKinney, C. (2003). Cooperative management of transboundary water resources in Central Asia. In D. Burghart, & T. Sabonis-Helf (Eds.), *In the tracks of Tamerlane. Central Asia's path to the 21st century* (pp. 187-220). Washington: National Defense University. Center for Technology and National Security Policy.

Micklin, P. (2000). *Managing water in Central Asia. Central Asian and Caucasian Prospects*. London: Royal Institute of International Affairs, 72 p.

Mirzaev, N.N. (2012). *Guide on organizational aspects of improving water demand management. Project "Integrated Water Resource Management in the Ferghana Valley"*. Tashkent, 68 p.

Nazarbayev, N.A. (2011). *Global energy and environmental strategy for sustainable development in the 21st century*. Moscow: Ekonomika, 194 p.

Nazarbayev, N.A. (2017). *The era of independence*. Astana, 508 p.

O'Hara, S. (2000). Central Asia's water resources: Contemporary and future management issues. *International Journal of Water Resources Development, 16*(3), 423-441. http://dx.doi.org/10.1080/713672501

O'Neill, G. (2003). Land and water 'reform' in the 1920s – Agrarian revolution or social engineering? In T. Everett-HeathCentral (Ed.), *Central Asia: Aspects of transition* (pp. 54-75). London: Routledge.

Ormysheva, T.A. (2019). *Challenges of environmental security in Central Asia: Contradictions between national and regional approaches on transboundary rivers*: Dissertation for Doctor of Philosophy. KazNU named after Al-Farabi, Almaty, 142 p.

Paramonov, V.V., Strokov, A.V., & Abduganieva, Z.A. (2017). The EU's influence on Central Asia: Review, analysis, and forecast. Almaty: Friedrich Ebert Foundation, 117 p.

Prasad, R., Kumar, S., Yadav, A.K., Singh, R., & Kumar, N. (2017). Impacts of climate change on agriculture: Adaptation, mitigation, and environmental policy. In *Plant adaptation strategies in changing environment* (pp. 329-345). Singapore: Springer. http://dx.doi.org/10.1007/978-981-10-6744-0_14

Prins, G. (1993). *Threats without enemies: Facing environmental insecurity*. London: Earthscan, 228 p.

Pulatov, Ya.E., & Mukhabbatov, Kh.M. (2021). Water resources of the Aral Sea basin, water distribution and ways to resolve water deficiency. *Central Asian Journal of Geographic Studies, 1-2*, 70-83.

Rakhimov, M.A. (2011). *International cooperation of Uzbekistan in ensuring stability and sustainable development in Central Asia*. Tashkent: Tangi Nashr, 230 p.

Submetido em: 10/10/2024
Aprovado em: 18/12/2024
Avaliação: Double Blind Review
ISSN: **2316-2880**

Rogozhina, N.G. (2015). *Environmental policy in developing countries*. Moscow: Aspekt Press, 336 p.

Saidov, S.S. (2017). Modern approaches to water resource management in Central Asia. *Bulletin of the Tajik National University, 2/5*, 81-84.

Scott, K.A., & Tapa, B. (2019). *Environmental security*. Oxford: Oxford University Press, 213 p.

Shevtsov, M.N. (2015). *Water-ecological problems and water resource use*. Khabarovsk: Izd-vo TOGU, 197 p.

Sievers, E. (2002). Water, conflict, and regional security in Central Asia. *New York University Environmental Law Journal, 10*(3), 356-402.

United Nations. (2017). *Achieving the sustainable development goals in Northern and Central Asia*. Bangkok: ESCAP, 49 p.

Valentini, K.L., Orolbaev, E.E., & Abylgazieva, A.K. (2004). *Water problems of Central Asia*. Bishkek, 142 p.

Vinokurov, E., Akhunbaev, A., Usmanov, N., & Sarsembekov, T. (2022). *Regulation of the water-energy complex of Central Asia. Reports and working papers 22/4*. Almaty: Eurasian Development Bank, 117 p.

Weinthal, E. (2002). *State making and environmental cooperation: Linking domestic and international politics in Central Asia*. Cambridge: MIT Press, 286 p.

Wolf, A. T., & Hammer, J. (2000). Trends in transboundary water disputes and dispute resolution. In M.R. Lowi & B.R. Shaw (Eds.), *Environment and security* (pp. 123-148). London: Palgrave Macmillan.

Zeitoun, M., & Allan, J.A. (2008). Applying hegemony and power theory to transboundary water analysis. *Water Policy, 10*(2), 3-12. http://dx.doi.org/10.2166/wp.2008.203

Zeitoun, M., & Warner, J. (2006). Hydro-hegemony: A framework for analysis of transboundary water conflicts. *Water Policy, 8*(5), 435-460

Zoidov, K.Kh., & Medkov, A.A. (2015). Evolutionary-institutional approach in the study of the implementation of major energy projects and water problems in Central Asia. *Market Economy Problems, 1*, 54-68.