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THE ROLE OF WATER DIPLOMACY IN THE MANAGEMENT OF TRANSBOUNDARY WATER RESOURCES: A CASE STUDY OF CENTRAL ASIA

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ABSTRACT: This article analyzes the role and significance of water diplomacy in the management of transboundary water resources, based on the experience of Central Asian countries. It examines the distribution of water resources in the region, their rational use, and interstate cooperation mechanisms in addressing water-related issues. In addition, the impact of water diplomacy on regional stability, security, and integration processes is highlighted through the examples of the Amu Darya and Syr Darya river basins. The results of the study demonstrate that water diplomacy is an important tool for the effective management of transboundary water resources and for strengthening mutual trust between states.

Keywords: water diplomacy, transboundary water resources, Central Asia, regional integration, water security, Amu Darya, Syr Darya, interstate cooperation, sustainable development, water policy.

ANNOTATSIYA: Mazkur maqolada transchegaraviy suv resurslarini boshqarishda suv diplomatiyasining o‘rni va ahamiyati Markaziy Osiyo davlatlari tajribasi misolida tahlil qilinadi. Mintaqada mavjud suv resurslarining taqsimlanishi, ulardan oqilona foydalanish hamda suv bilan bog‘liq masalalarni hal etishda davlatlararo hamkorlik mexanizmlari o‘rganilgan. Shuningdek, Amudaryo va Sirdaryo havzalari misolida suv diplomatiyasining mintaqaviy barqarorlik, xavfsizlik va integratsiya jarayonlariga ta’siri yoritilgan. Tadqiqot natijalari suv diplomatiyasining transchegaraviy suv resurslarini samarali boshqarish va davlatlar o‘rtasidagi o‘zaro ishonchni mustahkamlashdagi muhim vosita ekanligini ko‘rsatadi.

Kalit so‘zlar: suv diplomatiyasi, transchegaraviy suv resurslari, Markaziy Osiyo, mintaqaviy integratsiya, suv xavfsizligi, Amudaryo, Sirdaryo, davlatlararo hamkorlik, barqaror rivojlanish, suv siyosati.

INTRODUCTION

The sustainable management of transboundary water resources is one of the most important conditions for socio-economic development, environmental security, and regional stability in Central Asian countries. The flow of the Amu Darya and Syr Darya river basins through several national territories intensifies interdependence in water use and requires coordinated policies and agreements. Artificial borders drawn during the Soviet period, as well as ethnic and territorial divisions, continue to intensify disputes and competition over resource use, including water. In conditions of water scarcity, climate change, rapid population growth, and increasing demands in agriculture and energy sectors, Central Asian countries face a complex geopolitical situation. In

such circumstances, water diplomacy-defined as a practice of reaching agreements through dialogue, mutual trust, harmonization of interests, and legal-institutional mechanisms has become an essential tool for strengthening regional cooperation. The experience of resolving border disputes through constructive dialogue and shared norms and values also creates opportunities to bring stakeholders closer in the water sector. Therefore, analyzing the role and effectiveness of water diplomacy in the management of transboundary water resources in Central Asia is of both theoretical and practical importance.

DISCUSSION AND RESULTS

The Central Asian experience shows that relations around transboundary water resources are not characterized by "permanent conflict," but rather by a complex conflict–cooperation dynamic. Between 1951 and 2018, 591 water-related political events were recorded in the region, of which approximately 89% were cooperative in nature, demonstrating the dominance of cooperation despite the prevailing "conflict narrative" in official discourse [1]. However, the increasing mismatch between water availability and agricultural land distribution (annual growth of the water–land Gini coefficient) creates structural conditions for future tensions [2]. In the post-independence period, the fragmentation of the former unified management system, lack of coordination among national strategies, and divergence between upstream (hydropower) and downstream (irrigation) interests have deepened tensions [3]. In this context, water diplomacy has often functioned in a reactive and crisis-response mode, while stable basin-level institutional mechanisms remain insufficient [4].

From a normative-legal perspective, although regional states recognize the principle of "equitable and reasonable utilization," specific allocation rules, enforcement mechanisms, and transboundary security frameworks remain weak. Institutional fragmentation is considered a more serious challenge than normative gaps [5]. In the Amu Darya and Syr Darya basins, although numerous agreements have been adopted, they are often fragmented, short-term, and strongly dependent on political cycles [6]. At the same time, the existence of more than 100 practical agreements at the level of tributaries in the Syr Darya basin demonstrates the potential for "bottom-up cooperation" even under high-level political tensions [7]. Game-theoretical and benefit-sharing models show that full cooperation among the four states would increase economic gains for all parties, and that the Shapley value method could provide the most stable distribution. However, without sufficient compensation for upstream states (e.g., Kyrgyzstan), compliance with agreements remains uncertain. This indicates that the effectiveness of water diplomacy directly depends on the degree of institutional and material guarantee of interests.

WEF (water–energy–food–ecosystem) nexus-based modeling confirms that water flow, energy balance, and agricultural demand in the Aral Sea basin are primarily governed by human activity and the level of transboundary coordination [8]. Evolutionary game models show that the introduction of reward–penalty mechanisms by basin institutions accelerates convergence toward a Pareto-optimal equilibrium, meaning that without active institutional governance, the system does not naturally reach optimal outcomes. Comparative global cases (Nile, Mekong, Tigris–Euphrates) confirm the same conclusion: similar hydrological conditions produce different diplomatic outcomes, where power asymmetries, institutional quality, and framing of interests play a decisive role.

At the political-institutional level, water diplomacy in Central Asia operates at three main levels. The first is high-level interstate dialogue and presidential consultative meetings, which ensure political rapprochement but rarely translate into binding technical quotas or enforcement

mechanisms [10]. The second level is international organizations (UN, World Bank, OSCE, EU, IFAS), where more than 70% of funding is directed toward infrastructure modernization, while less than 10% is allocated to institutional capacity-building and human resource development. The third level consists of subnational and para-diplomatic initiatives, where regional and local actors develop practical solutions such as joint water use in border districts. This multi-level diplomacy demonstrates that water issues should not be viewed solely as foreign policy matters but also as internal governance and regional development issues. The main challenge in Central Asia is not water scarcity itself, but trust deficit and institutional fragmentation. Historical legacy, strong attachment to national interests, and incomplete implementation of international legal norms result in weak, short-term, and politically dependent agreements [9]. Therefore, improving water diplomacy requires: (1) strengthening basin-wide integrated institutions; (2) expanding benefit-sharing agreements based on the WEF nexus; (3) allocating more international funding to institutional capacity and training; and (4) linking local-level agreements with high-level political frameworks.

CONCLUSION

In conclusion, research on transboundary water resource management in Central Asia demonstrates that water diplomacy is becoming a central factor of regional stability and security. Water scarcity, unequal distribution, and conflicting upstream–downstream interests in the Amu Darya and Syr Darya basins create conditions for tension, but there are still significant opportunities for cooperation. The main conclusion is that the region has not yet developed a fully sustainable transboundary water governance system aligned with global standards. Although states recognize international water law principles such as “equitable and reasonable use,” clear allocation rules, enforcement mechanisms, and basin-wide mandatory cooperation institutions remain underdeveloped. At the same time, analyses show that the main obstacles are not only physical water scarcity, but also trust deficits, institutional fragmentation, and excessive prioritization of national interests. International organizations such as the UN, World Bank, EU, and IFAS mainly focus on infrastructure financing, while institutional capacity-building and human resource development remain underfunded. The Aral Sea basin case also demonstrates strong interdependence between water, energy, agriculture, and ecosystems, requiring integrated diplomatic approaches. Game theory and evolutionary models show that basin commissions and reward–penalty mechanisms can play a decisive role in achieving Pareto-optimal cooperation. In conclusion, the future of water diplomacy in Central Asia can be built on three pillars: (1) transforming international legal principles into enforceable basin institutions; (2) redirecting international resources toward institutional capacity and diplomacy training; and (3) developing inclusive, trust-building long-term strategic dialogue among all stakeholders. Under these conditions, water diplomacy can evolve not only into a conflict mitigation tool but also into a platform for geopolitical balance, environmental sustainability, and joint regional development.

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