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O‘RNI” MAVZUSIDAGI XALQARO ILMIY VA ILMIY-TEXNIKAVIY
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| TAHRIR HAY'ATI RAISI: |
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| BOSH MUHARRIR: |
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Elektron pochta manzili: buxtimi@mail.ru

CLIMATE CHANGE AND WATER SCARCITY: EMERGING GLOBAL CHALLENGES

*Ikromov Ravshan Abdurasul ugli
Bukhara State Technical University, Hydrology and Ecology faculty, teacher
Eshmanov Husniddin Narzulla ugli
Hydrology of rivers and reservoirs 3 courses 2 groups student*

Abstract. *Water – as one of the most strategic resources of the future – demands a responsible approach, sustainable management, and global solidarity. Otherwise, competition over water resources may pose serious threats not only to the natural environment but also to international peace and stability. Water is the foundation of life, an essential source of vitality, and a critical natural resource necessary for human well-being. However, in recent years, the deterioration of the global ecological environment, climate change, and the growing negative impact of human activity have led to a significant decline in fresh water availability. This situation is causing not only environmental problems but also social, economic, and political challenges in many regions of the world.*

Today, water scarcity is no longer just about the limited availability of natural resources — it has become a global crisis tied to unequal management, unfair distribution, and political rivalry. Rapid population growth, industrial expansion, and inefficient water use in agriculture have all contributed to a sharp increase in demand for water. At the same time, global warming, desertification, and droughts continue to reduce existing water sources. Water scarcity is intensifying competition among countries over transboundary water resources, which in turn increases the risk of geopolitical conflicts. For example, upstream countries aim to strengthen control over water flows, while downstream nations seek to protect their access and interests. Such tensions are increasingly evident in regions like the Middle East, Central Asia, and parts of Africa. This article analyzes the root causes behind the decline of water resources, the environmental and political consequences, as well as possible solutions to the issue. Effective approaches such as water conservation, wastewater recycling, and the implementation of innovative technologies can help address these challenges. Furthermore, promoting fair water policies at the international level, strengthening cooperation among stakeholders, and using diplomatic tools to ease tensions are emphasized as essential strategies.

Keywords: *innovative technologies, evolution, geopolitical conflicts, geopolitical struggles, water diplomacy, extreme weather, desalination, mold fungus, extreme weather.*

Introduction. *In the 21st century, issues related to water resources are causing not only ecological challenges but also economic and political threats. The extent to which water affects the environment, climate, and the history and culture of humanity reaffirms its vital role in sustaining life. However, the unequal distribution and pollution of water resources are leading to serious global problems, exacerbating geopolitical conflicts in some regions. Water is one of the most essential resources for human activity, widely used in drinking, agriculture, industry, and energy sectors. However, the limited availability and mismanagement of water resources have negative impacts on economic growth and social stability. A significant issue in managing water resources is the inequitable distribution and contamination of water. As a result, the increasing demand for water, pollution, and competition over transboundary water resources may lead to geopolitical tensions. This article analyzes the management of water resources, necessary measures for their adequate and efficient distribution, and the impact on global security and peace. It also discusses the future of water governance policies, international cooperation, and the crucial role of water diplomacy.*

Relevance of the Topic. *In the 21st century, water scarcity has become a global ecological and geopolitical issue. Water resources are one of the most essential natural resources for life, and their scarcity significantly impacts human life, agriculture, industry, and social sectors. Today, the distribution of water resources across the globe is unequal. While some regions have sufficient water, others face difficulties and geopolitical conflicts over access to the majority of water resources. In other words, water has become not only an ecological but also a geopolitical resource of critical importance. The growing demand for water, climate change, water consumption in agriculture and industry, and the unequal distribution of water resources have intensified*

competition for these resources. This, in turn, has led to geopolitical struggles between countries over water sources. For example, disputes over rivers such as the Nile, Tigris, and Euphrates, conflicts over water distribution, and regional tensions are demonstrating their widespread impacts. Therefore, water scarcity has become a significant threat not only in ecological terms but also socially and politically. Today, innovative technologies for water conservation, pollution reduction, and water recycling are being introduced. Through these technologies and sustainable management methods, it is possible to use existing water resources wisely, conserve them, and ensure their availability for future generations. International cooperation and water diplomacy are increasingly viewed as essential strategies for the fair distribution of water resources.

Conclusion. The hidden ecological problems behind the convenience and power of water are revealed, highlighting the necessity for society to search for sustainable movement alternatives. It is crucial to focus on environmentally friendly transportation solutions for long-term ecological security. The reduction of water resources is an issue that must be urgently addressed on a global scale. If no action is taken now, not only nature but also humanity itself will face serious risks in the future. Each of us is responsible for saving water and keeping it clean, as water is the continuation of life. Water resources are one of the key factors for human life, agriculture, industry, and the economy, and their scarcity is leading to global ecological and geopolitical issues.

Due to climate change, population growth, and the increasing demand for water in industry and agriculture, water scarcity has become a critical issue worldwide. This can lead to ecological crises, economic difficulties, weakened food security, and the intensification of geopolitical conflicts. Significant portions of valuable water resources are being lost due to mismanagement and pollution. Therefore, measures such as water conservation, reducing pollution, and implementing innovative technologies are of urgent importance.

The development of water diplomacy at the international level, agreements on fair distribution, and effective use of water resources are crucial. In the 21st century, water has become a geopolitical battleground, potentially increasing competition between nations. Therefore, countries need to cooperate, implement innovative technologies, and improve water management systems to find solutions to this issue. Otherwise, serious ecological and economic risks for future generations will increase. Addressing these problems requires strengthening international cooperation, developing sustainable water management systems, and encouraging every individual to save water as an integral part of a global strategy.

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