



Impact of Global Climate Warming on River Water Regime

Toshturdiyev Nurbek

The National University of Uzbekistan named after Mirzo Ulugbek
3rd year student of hydrometeorology faculty

Phone: +998 (88) 910 42 46

E-mail: nurbektoshturdiyev86@gmail.com

Abstract: This article presents examples of global warming impacts on water resources and adaptation tools. Water resources issues have extensive and complex interactions with each other. Therefore, current technologies to combat these effects and implement integrated assessments contain a lot of uncertainty and are difficult to implement. Many researchers have tried their best to develop numerical simulation methods that can evaluate each interaction and the integrated effects.

Keywords: Global warming, river basin, ecology, climate, drought, greenhouse gases, fresh water.



This is an open-access article under the CC-BY 4.0 license

INTRODUCTION

Global warming has already affected fields as diverse as ecology, agriculture, and infectious diseases, all of which are strongly related to water. Fresh water affects many phenomena both actively and passively, directly and indirectly. It would be very difficult to intuitively understand complex organic relationships. Numerical models are used to understand complex coupling in an integrated way. Many numerical models do not perfectly represent real-world conditions, but provide an easier objective quantitative assessment than intuitive feelings. Another reason numerical models are useful is their contribution to decision-making and policy-making by enabling future predictions under various scenarios.

Most water resource assessment models rely on climate models. In other words, impacts on water resources are discussed using assessment models and changing boundary conditions, which are given by a general circulation model that represents future water and energy movements in the ocean and atmosphere. A scenario itself is a future assumption in a policy or social environment. It contains a large amount of ambiguity. We cannot reliably predict future scenarios. Therefore, this model is too abstract to



explain the interaction between water resources and the social environment. Current assessments of water resources under global warming appear simple, but they involve considerable effort to predict changes in water resources. One of the main aspects of studying the influence of climatic factors on the hydrological regime of the river is the analysis of long-term monitoring data on weather and hydrological parameters. allows to assess the level of influence on hydrological processes in the river.

As the impact of climate change on the water sector is enormous, it is crucial to formulate water policies that take climate risks into account. Water availability and climate change Climate change is expected to change the hydrological regimes and temperature of rivers. The effects of this phenomenon directly affect freshwater ecosystems, water quality, and human water consumption. According to UN Water: "Water availability is becoming more unpredictable in many places, and increased flooding threatens to destroy water points and sanitation facilities and contaminate water sources. Some Droughts in the regions are exacerbating water scarcity and thus negatively impacting people's health and productivity."

The availability of water on continents is critical to human health, economic activity, ecosystem function, and geophysical processes. Due to the temperature dependence of the saturated vapor pressure of water in the atmosphere, the global water cycle is expected to change as a result of climate change. Changes in surface hydroclimate resulting from warming exhibit complex and uncertain regional patterns with respect to temperature change. Regional increases and decreases in precipitation and runoff are expected. Expected consequences of climate change include changes in the quantity and quality of water resources. Climate change phenomena may alter the frequency and magnitude of precipitation, temperature, and flows, challenging the resilience of current infrastructure and increasing the likelihood of hydrological extremes such as droughts and floods. These changes have important implications for the hydrological cycle, both regionally and globally. Impacts may be exacerbated by demographic, economic, environmental, social, and technological factors. Studying the magnitude and significance of changes in the hydrologic cycle caused by climate change and their impact on water availability is a topic of serious concern to environmental and water resources professionals worldwide. Much research is being done at the global, local, and regional scales to improve understanding of water availability under climate change impacts. Drought and Climate Change The atmosphere over arid regions is often characterized by a strong demand for moisture, but the amount of precipitation received is insufficient to meet this demand. Drought refers to a state of permanent water scarcity strongly associated with strong solar radiation, increased temperatures, significant potential evapotranspiration, and reduced atmospheric moisture. In addition, recent studies show that dryland ecosystems are undergoing significant changes in response to climate change. predicted significant changes in temperature and precipitation patterns



over land, which could accelerate the extinction of key species within biological crustal communities.

In conclusion, it examines the phenomenon of climate change and its effects on the global environment, with particular attention to the effects on river flows and freshwater ecosystems. In addition, there is a challenge in determining the most effective strategy to address the root cause of climate change, i.e. greenhouse gas emissions. In addition, climate change stands out as the most remarkable phenomenon of the last millennium, and its main cause is the increase in greenhouse gas emissions. A delayed ocean feedback event can lead to uncertainty about the magnitude and impact of greenhouse gas emissions on surface temperature, particularly at the regional scale. This is due to the masking effect of the oceans on these emissions. Changes in the periodicity of river flows, changes in hydrological structures that lead to an increase in the frequency and severity of floods and droughts are primarily influenced by climate change and human activities. The effects mentioned above can have a significant impact on freshwater ecosystems. The methodology used for river flow analysis includes the use of flow data, climatic data, numerical elevation models, land cover data and hydrological models. The text states that the process of selecting an appropriate hydrologic model typically includes, but is not limited to, the goals and characteristics of the system under consideration, including, but not limited to, hydrologic prediction, climate change impact assessment, and anthropogenic impact assessment. based on fundamental understanding. affects the hydrological regime. Due to global climate change, uncontrollable problems may arise in the river water regime. A clear example of this is floods or droughts. To avoid these problems, we need to adapt to global climate change. Systematic implementation of water resources management is necessary.

REFERENCES:

1. Kawagoe, S., S. Kazama and M. Sawamoto (2006) Slope hazard probability involving return period of extreme precipitation. Annual Journal of Hydraulic Engineering.
2. Climate Change 2022: Impacts, Adaptation and Vulnerability. (n.d.). Retrieved April 26, 2022, from <https://www.ipcc.ch/report/ar6/wg2>
3. <https://hydromet.uz/uz/node/2451?ysclid=lygymx3xm4651319644>
4. DV Nazaraliyev, JS Hamrokulov, OR Rustamova. Assessment of the influence of climatic factors on the flow of the Zarafshan River. Journal of engineering, mechanics and modern architecture 3 (3),