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ENVIRONMENTAL PROBLEMS OF WATER RESOURCES AT THE PRESENT STAGE

Madraim Khasanovich Sarikulov
Associate Professor, Almalyk State Technical Institute,
Almalyk, Uzbekistan
sarikulov.madraim4@gmail.com

Nurmatov Begzod Khasan og'li
Assistant, of the Almalyk State Technical Institute,
Almalyk, Uzbekistan

Abstract
This article examines water resources as a source of drinking water for all inhabitants of the globe in the context of socio-economic development, energy and food production, healthy ecosystems, and human survival. It also examines issues related to improving the provision of clean water to populations in various countries. Furthermore, it highlights the problem of water scarcity, taking into account the demographic growth of the planet, which has significantly increased water consumption. The article also discusses the factors that contributed to water scarcity, which subsequently led to a deterioration in living conditions and slowed the economic development of countries experiencing water shortages.

Key words: Water resources, water scarcity, water disaster, population migration, UN classification, groundwater and surface water, water erosion, spread of infections, waste-free technologies, radioactive and toxic waste, atmospheric oxygen.

INTRODUCTION

Water is crucial for sustainable development, as well as for socioeconomic development, energy and food production, healthy ecosystems, and human survival. Water also underpins adaptation to climate change, serving as a vital link between society and the environment.

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Along with the growing global population, industrial and agricultural production is increasing. As a result, drinking water consumption is rapidly increasing in all regions of the world. This used drinking water is returned to rivers as wastewater and then ends up in seas and oceans. In this situation, the growth of wastewater treatment facilities is currently lagging behind water consumption. The problem of drinking water on Earth is becoming increasingly pressing. This problem is common to all humanity, as the movement of water masses knows no boundaries. The global freshwater problem stems from the lack of replenishment of water resources.

LITERARY RESEARCH

Today, drinking water shortages are felt worldwide. The problem of drinking water shortages on Earth is becoming one of the most pressing issues of our time. Along with other global challenges, water resources are becoming increasingly pressing. This is especially critical from a public health perspective. The global freshwater crisis stems from the failure to replenish water resources. It should be noted that water resources are currently considered a global issue, and as the global population grows, this problem is becoming even more pressing.

As noted in source materials [1], water scarcity is a growing concern in many parts of the world. Population growth, urbanization, increasing demand for irrigated agriculture, and poor water management are important factors driving water scarcity, which is exacerbated by the impact of climate change, which is leading to an increase in the frequency and severity of droughts. Today, more than 2 billion people live in areas with water scarcity. By 2025, half the world's population is expected to face this situation. It is projected that every 1°C increase in temperature caused by global warming will reduce renewable water resources by 20%. Water scarcity has serious consequences for society and threatens the sustainability of development. For example, water scarcity can negatively impact the provision of water supply and sanitation services and affect human health. Insufficient safe drinking water can compromise adequate hygiene and increase the risk of diarrhea. Water scarcity can also limit economic growth by reducing agricultural production, impact the environment and biodiversity by reducing

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environmental flows necessary for ecosystem health, and lead to conflicts within and between countries and increased migration flows.

The website [2] provides statistical data on water resources by country. Latin America has the best water reserves, accounting for one-third of the world's reserves, followed by Asia with one-quarter. Next come the OECD countries (20%), followed by sub-Saharan Africa and the former Soviet republics, each accounting for 10%. The Middle East and North America have the most limited water resources (1% each).

In the materials of the 8th World Water Forum [3], UN experts noted that the world is on the brink of a water catastrophe. They also noted that one in ten people on Earth experiences an acute shortage of drinking water, which amounts to almost 884 million people. According to UN experts, by 2050, water demand will increase by 20%. Many countries have already reached their maximum water consumption capacity. And in the near future, the problem of water shortages will become a political issue, according to UN experts. If no action is taken, nearly 5 billion people (approximately 67% of the global population) will be without adequately treated water by 2030. Water shortages in desert and semi-desert regions will trigger intense population migration, expected to affect between 24 million and 700 million people. In 2017, over 20 million people worldwide fled their homes due to a lack of drinking water.

According to N.A. Voronkov [4], water is the most common substance in nature and occurs in three states of matter: solid, liquid, and gas. The role of water in nature is vast and varied. Without water, the development and existence of plants, animals, and humans is impossible. As is well known, two-thirds of the Earth's surface is covered by water. If it could be distributed evenly, our planet would be encased in a four-kilometer-thick layer of water.

According to source [5], laboratory studies have proven that the ecological state of water resources does not always meet standards. This leads to various problems. One-third of the world's population faces difficulties due to water shortages. The shortage is acute in cities such as New York and Tokyo, as well as in many towns in Algeria, where water is mainly imported. Clean drinking water is an expensive commodity that is exported from one country to another. For example, Hong Kong buys water from China. In some Western European

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countries, the shortage of fresh drinking water is due to its complete absence, and countries such as the Netherlands, Germany, and Denmark buy water from Scandinavian countries.

The website [6] notes that water scarcity is the lack of sufficient water reserves to meet the needs of the population and domestic animals for clean drinking water. The main sources of fresh water are rivers, lakes, and swamps. However, the natural distribution of resources throughout the world is uneven. For example, Europe is home to 20% of the planet's population and accounts for only 7% of its reserves. The number of people on earth is growing every day, and with it, so does the demand for drinking water. In other words, if the annual population growth is 84 million, then the necessary increase in water resources should be at least 60 million cubic meters. Incorrect, irrational use of natural resources leads to their short-term consumption, since groundwater regeneration occurs very slowly - 1% per year. Furthermore, water pollution (industrial wastewater, discharges, fertilizer runoff from fields) plays a significant role in this problem. For example, in the United States, 37% of rivers and lakes are so polluted that it is not even possible to swim in them. Experts estimate that unless action is taken, nearly 5 billion people, representing approximately 67% of the global population, will still lack adequate water treatment by 2030. Currently, there are approximately 750 cubic meters of water available per capita. By 2050, this figure will drop to 450 cubic meters. According to the United Nations classification, up to 80% of the world's countries will be located below the water stress threshold. These areas are projected to be particularly affected: Africa, the Middle East, northern China, and South Asia.

Methodology

One of the current water resource challenges is the protection of groundwater and surface water. At the core of this problem is the process of providing fresh water suitable for drinking, irrigation, industrial, and municipal water supply. Freshwater resources are limited worldwide, and shortages are experienced not only in arid countries but also in countries with powerful rivers. The cause of the shortage in these areas is water pollution from industrial, transport, and municipal wastewater. Rivers flowing through agricultural areas are saturated with fertilizer

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and pesticide runoff. Soil erosion from arable land leads to the shallowing and disappearance of small rivers. Thus, the future of surface runoff and reservoirs is linked to protecting rivers from pollution. As at the beginning of the century, agriculture remains the main user.

The exponential increase in water use is coupled with the chemicalization of the industry and increased water erosion. This type of water use has a particularly significant impact on the availability of clean water in agricultural areas, which is why access to clean water varies so much between urban and rural areas in developing countries. Developing countries account for a significant portion of arid territories. In these countries, one in three residents suffers from a lack of drinking water and inadequate sanitation. River pollution by microflora is facilitated by certain lifestyle practices and customs (such as the Hindu tradition of ablutions) and the discharge of untreated sewage. Rivers here are notorious for being "highways" for the spread of infections. Approximately 80% of illnesses and a third of deaths are related to the consumption of contaminated water.

Water use for industrial purposes is growing. Until recently, the deterioration of water quality in developed countries was primarily due to industrial pollution. The development of modern technologies and the relocation of water-intensive industries to developing countries have significantly improved the situation. Developed countries are gradually improving their aquatic environments. Thanks to expensive wastewater treatment methods, the Great Lakes system in the United States and Canada has been restored. Much has been done to restore rivers and lakes in Western Europe. In Russia, approximately 20,000 wastewater treatment plants were commissioned in the 1980s, stabilizing the condition of some rivers, but overall, the situation remains very serious.

Industrial pollution of rivers in developing countries is increasing. Great hopes are pinned on the introduction of low-flow and waste-free technologies. Clean rivers, large and small, are a key factor in maintaining the cleanliness of the World Ocean. Oceans, enclosed and semi-enclosed seas, cover most of the Earth's surface, influencing the climate and atmosphere, and providing food for the planet's growing population. Humans are extracting an increasingly significant share of minerals from continental shelves.

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As is well known, the world's oceans are a vital element of the global life-support system. However, pollution from industrial wastewater, cities, coastal tourist resorts, coastal development, overfishing, and the harvesting of marine mammals worsen the environmental situation. There is every reason to believe that the world's oceans pose a global problem. Some of the pollution comes from rivers. The trend of population shifting toward the shores of seas and oceans suggests an increasing impact of direct pollution discharge into coastal waters. Direct discharges into the ocean are particularly significant in developing countries. The use of deep-sea trenches for the storage of radioactive and toxic waste is a major concern. Experts estimate that more than 20 million tons of industrial, household, and radioactive waste have accumulated in the ocean. Annual discharges now reach 1 million tons, with 70% of the pollution coming from land-based sources. Some countries discharge liquid and solid radioactive waste into the world's oceans. The northwest Atlantic Ocean accounts for a particularly large volume of this waste. There are such discharges in the Pacific Ocean as well.

The planet's water needs are growing alongside population growth and industrial expansion, depleting the Earth's water resources and worsening environmental conditions. According to a UN report, more than 400 million people worldwide currently live in areas with water shortages. More than 1 billion people lack access to clean drinking water. Approximately 850 million people are starving due to a lack of water for irrigating their crops.

According to statistics, 2 million people die annually from diseases related to contaminated drinking water, the majority of them children. In developing countries, 75% of all disease cases are related to the use of water unsuitable for cooking and drinking. If the trend of increasing water consumption continues and water resources are not replenished, water shortages will affect two-thirds of the world's population by 2025, and approximately 2 billion by 2050, threatening an environmental catastrophe. A shortage of water resources could ultimately lead to the extinction of all life on Earth. Water is virtually the only source of atmospheric oxygen through its decomposition during photosynthetic processes.

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CONCLUSIONS

As we can see, water shortages in the modern world are becoming increasingly problematic, and addressing them is becoming a top priority. Reducing water consumption is no longer feasible, as this would require curtailing material production and foregoing many of the benefits of civilization. Pollution is also a factor, as the volume of potable water is declining. Therefore, greater attention must be paid to maintaining the purity of water resources. It is commonly believed that water supplies are inexhaustible. However, fresh water is, and will remain, one of the most important resources worldwide for the next several centuries.

Therefore, we can conclude that addressing water resource issues today is crucial, as all life on earth relies on water. Furthermore, water shortages can lead to famine, disease, political instability, and armed conflict. Therefore, to ensure that future generations do not experience a shortage of fresh water, we must urgently strive to ensure the purity and safety of water resources. Each of us can contribute to solving this problem by observing all safety regulations and conserving water consumption in the modern world.

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