

ENVIRONMENTAL PROTECTION ISSUES IN THE CONDITIONS OF ECOLOGICAL AND CLIMATIC DETERMINISM

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Abstract: The article considers theoretical and practical aspects of environmental protection and conservation of ecosystems in the Central Asian region in the context of the aggravation of the environmental crisis and global climate change. An analysis is given of the determinism of the state and trends of change in aquatic ecosystems, biodiversity, desertification and other components of the natural environment by climatic factors. The most significant consequences of climate change in the global and regional contexts are revealed. The necessity and importance of the transition of modern civilization to a "green" economy are substantiated.

Keywords: environmental protection, ecology, ecosystems, biodiversity, flora, fauna, transboundary rivers, water resources, food, health, climate, climate determinism, intensity of climate change, climate migration, Uzbekistan, Central Asia.

The modern world is fleeting and changeable. The ongoing processes are radically changing the face of the world. Today, everything in the world is closely interconnected: any negative actions in one place, especially when it comes to nature, negatively affect other territories along the entire chain of ecosystem elements.

More and more often, people are wondering what is happening to the environment? The answer is obvious. We are not only witnessing a natural pandemic, but also in many ways its culprits. In our view, at the global level, a collapse is occurring and intensifying in many components of the ecosystem.

Climate change, shortage of fresh water resources, the Aral tragedy, land and forest degradation, desertification, loss of biodiversity - this is an incomplete list of global environmental problems. The past year of 2024 was no exception.

According to international experts, the unaccounted costs of current approaches to economic activity, reflecting the impact on biodiversity, water, health and climate change, including from food production, amount to at least 10-25 trillion US dollars per year (1). The annual cost of illegal mining, including in the field of wildlife, timber and fish, ranges from 100 to 300 billion US dollars (1).

Under these conditions, only to improve the state of biodiversity, countries of the world annually, mostly out of necessity, spend up to 200 billion dollars (1). It is known that the water cycle is regulated by ecosystem and geophysical processes, maintaining biodiversity and making a significant contribution to human health and

well-being. However, anthropological factors have actively intervened in this process, which has led to the fact that aquatic biodiversity is being lost faster than terrestrial biodiversity. In particular, many marine systems around the world have been overexploited and degraded as a result of human activity. Over the past 45 years, fish catches have increased from 20 million tons to 135 million tons per year. As a result, 75% of fish resources have disappeared, are depleted, or are at risk of extinction (2). Meanwhile, fish is included in the diet of every 5th person on earth. As a result, the pressure on marine ecosystems will only increase.

The situation with the planet's forest resources is alarming. According to experts, there are about 3 trillion trees growing on our planet, and approximately 15 billion trees are destroyed every year. Since the beginning of human civilization, about 45% of the Earth's trees have been destroyed. Every year, approximately 13 million hectares of forest disappear from the face of the Earth. The problem of water shortages and pollution is further aggravated. Overextraction of fresh water, degradation of wetlands and loss of forests have led to a decline in the quality of water resources and their resilience to climate change in many parts of the world, affecting not only biodiversity but also the availability of water and food, with consequences for plants, animals and humans.

Today, 1.9 billion people on the planet do not have access to safe drinking water. And as is known, at least 50 diseases are associated with poor water supply, water quality and sanitation. Every day, 5,000 people die in the world due to contaminated drinking water (2). By 2050, more than 2.7 billion people may suffer from water shortages.

Due to these circumstances, the UN defines the problem of water resources as one of the key problems in the world. In the case of Central Asia, this problem may become even more severe. An important aspect is the transboundary significance of the Central Asian hydrosystem, in which the state of mountain glaciers plays a huge role. The rapid melting of glaciers in the mountains of the region is causing frequent mudflows and other natural disasters, the economic damage from which, according to the World Bank, can amount to from 0.4% to 1.3% of the annual GDP of the Central Asian countries (3). Climate change on a planetary scale is inevitable and undeniable. At the same time, the priority source of such changes is an increase in temperature indicators, that is, warming caused by an increase in the concentration of greenhouse gases in the atmosphere.

Researchers have found that the increase in quantitative indicators of emissions of carbon dioxide, methane and other greenhouse gases and pollutants is largely due to the active activities of mankind. Air pollution, in turn, causes changes in the process of circulation and formation of the temperature regime of air masses in the lower layers of the atmosphere, causes destructive processes of stratospheric ozone and even changes the temperature and circulation regimes of the waters of the World Ocean.

It seems to us that, to characterize modern processes of climate change, it is possible to apply the idea of critical temperature. Planet Earth can be likened to a living organism. It is known that a biological organism, when the functions of normal

life activity are disrupted, increases its body temperature as a measure to protect itself from harmful bacteria and viruses, which helps to improve its resistance to harmful effects. At the same time, there is a critical limit to such actions: for a person, for example, an increase in body temperature of 42 degrees. The Earth also has a critical temperature, that is, a limit value, exceeding which will lead to irreversible processes.

The ecological and climatic situation in Central Asia continues to be a difficult challenge for the countries of the region. This is caused by the combined influence of both global and regional climatic processes. The priority source of such changes is global warming caused by the increase in the concentration of greenhouse gases in the Earth's atmosphere. Central Asia, located in the middle and high latitudes of the planet's northern hemisphere, is one of the regions most vulnerable to climate change. The average air temperature in Central Asia has increased from 1°C to 2°C over the past century, the variability and intensity of precipitation has increased in many areas, and there is a tendency to reduce the flow of small and large rivers. At the same time, there is a sharp increase in the frequency and amplitude of fluctuations in extreme flood values and periods of water shortage. Due to the drying up of the Aral Sea, climate changes in the sea basin are much more severe than in other regions, 2 times more intense than the average values in the world (0.29°C versus 0.14°C) (4).

The increase in the speed and intensity of climate change in the studied region is largely related to the rate of degradation of the Aral Sea ecosystem. The climate of Uzbekistan is becoming drier and hotter every year, the number of dust storms and snow drifts of significant intensity is growing. Thus, according to the World Meteorological Organization of the UN, the maximum temperature in 2022 was recorded on the territory of Uzbekistan, at observation points in the Navoi region - 47 ° C (5). When considering the state of aquatic ecosystems in the region, we can state a steady process of their destruction, which has led to catastrophic global climatic consequences. The degradation of the Aral Sea ecosystem and the emergence of new areas of desertification have become a catalyst for the processes of noticeable warming in the territory of Uzbekistan and Central Asia as a whole. The processes occurring as a result of these changes have recently acquired an uncontrollable nature with catastrophic large-scale consequences of a social, environmental and economic nature.

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Restoring ecosystems contributes to climate change adaptation and socio-ecological sustainability, and can also help mitigate the effects of climate change, as it accumulates carbon in forests, peatlands, seagrass beds, salt marshes, and marine and coastal ecosystems that help sequester carbon.

It should be noted that environmental turbulence has now reached such a level that the world is getting closer and closer to the point of no return. In these conditions, the main conclusion is that the factor of the future will be the increasing uncertainty of the near future in almost all areas of world politics and ecology.

What is this conclusion based on? On the difficulty of creating an adequate picture of the world. In particular, on the insufficient knowledge of the nature and results of possible steps and actions, as well as on the extremely weak predictability of the development of the current set of problems.

Moreover, there is a noticeable decline in the level of environmental morality in society.

But that's not all: the so-called "accompanying uncertainty" is no less important. It "is generated as a result of the unstable political and psychological state of societies and elites" (7), which have experienced various crises.

Conclusion: this instability is, as noted in the annual forecast "Russia and the World" of the Primakov Institute of World Economy and International Relations of the Russian Academy of Sciences, "the reason that prevents adequate analysis and perception of both reality itself and the analysis of reactions to events and the results of decisions made" (7).

Uncertainty is also aggravated by "widespread anxiety caused by expectations of a negative impact of technological and natural factors" (7). Unfortunately, the international summits and forums on ecology and climate do not produce the expected results.

The combination of the listed factors has created an international environment that is characterized by "an extremely high, even "radical" degree of uncertainty and tense expectations of a negative development of events."

All this causes changes in the psyche, psychology, behavior patterns, labor relations, which affects the normal development of economies. The quoted forecast rightly notes that "the resumption of discussion on these topics leads to a disappointing conclusion: the world is not ready for new epidemics, is not protected from them. To this we can add the fact that developed countries also demonstrate vulnerability to the threat of natural disasters, such as floods, hurricanes, which are becoming more frequent, including against the background of climate change." What can we say about other countries with less developed economic and natural potential?

In these conditions, it is necessary to take a number of systemic measures.

First, systematically and consistently implement the principles of the "green" economy, which is one of the optimal solutions to overcome the global environmental and climate crisis. In a simplified sense, a "green" economy is an economy with efficient use of natural resources, widespread use of renewable, resource-saving, waste-free and low-waste technologies, with low greenhouse gas emissions, with a significant reduction in risks to the environment.

The transition to a "green" economy is, in fact, a transition to a new socio-economic formation.

Of course, when transforming society from one formation to another, problems will arise. First of all, problems associated with the old conservative thinking, the lack of effective technologies for processing and recycling waste, treatment facilities, problems associated with the localization of production, lack of financial, material resources, etc.

Therefore, the development of a "green" economy requires government intervention in the existing "rules of the game", which implies the creation of a state regulation regime that encourages the development of environmental industries and technologies, the creation of the necessary infrastructure, the restructuring of key institutions, the reform of tax policy, etc. And in this sense, the most important role is played by the presence of strong political will, capable of shifting the emphasis in the development of the national economy towards "green" growth.

Second, given that water cooperation promotes sustainable resource management at the basin-wide scale of transboundary rivers and improves cooperation across sectors and stakeholders, improve groundwater management through cooperation at different scales, including support for community-based water management that enhances benefits across the nexus, while integrated water infrastructure and water-sensitive urban infrastructure harness natural systems to reduce the risks of floods and other hazards, provide benefits for food production and contribute to climate change mitigation.

Third, adopting sustainable agricultural practices (such as improved nitrogen use efficiency, integrated pest management, agroecology, agroforestry and sustainable intensification, reduced food loss and waste, new food/feed sources and sustainable healthy diets) that will enable existing agricultural land to meet the calorie and

nutritional needs of future generations in the medium to long term, recognizing that food systems based on a balance between people and nature and on the sustainable use of biodiversity provide resilient and healthy food, and contribute to the conservation of biodiversity and to the mitigation of and adaptation to climate change.

Fourth, implementing a “One Health” approach that supports the integration of food systems and biodiversity management with local health services to reduce the risks associated with the emergence and spread of zoonotic pathogens at source, malnutrition and other risks such as wildlife health, food production and ecosystem resilience. For example, Brazil's successful One Health System brings together public health professionals, veterinarians, and environmental health experts working with farmers and policymakers to co-develop holistic practices that address the social and environmental determinants of health and help prevent pathogen emergence and disease outbreaks in both humans and animals.

Fifthly, restoration of the values of spiritual morality and careful attitude of the population towards the environment. As practice shows, the knowledge and skills of indigenous peoples and local communities can contribute to the rational use of natural resources, successful conservation of biodiversity and sustainable management of other interrelated factors.

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