

THE WAYS TO ENSURE THE SUSTAINABLE DEVELOPMENT OF REGIONS BY IMPROVING THE STATE OF ECOLOGICAL PROBLEMS IN THE COUNTRY

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Annotation. The article discusses current ecological problems and the ways to ensure sustainable development of regions by improving these issues. It highlights the importance of addressing regional ecological problems and reducing their impact for the social and economic development of the region, emphasizing its significance in achieving sustainable development. To this end, the article scientifically analyzes the causes of existing ecological problems and presents proposals based on scientific approaches for mitigating and eliminating their effects.

Keywords: ecology, region, ecological policy, economy, land resources, industrial waste, agriculture, food, water, energy, clean air, natural resources

Introduction. The Republic of Uzbekistan is located in the center of the Central Asia region, at the junction of the borders of Asia and Europe. The country's geographic position offers favorable economic and geographical advantages, providing significant opportunities for international transport and communication connections. From a natural and geographical perspective, Uzbekistan is situated in the center of the Aral Sea basin, within a closed basin. Its territory mainly consists of plains, with some mountainous and foothill areas, and a large part of it is occupied by the Kyzylkum Desert. These factors are considered fundamental in shaping the country's natural environment and contributing to its current ecological situation.

In the current context of experiencing the complexity of ecological situations at global, regional, and local levels, it is crucial to find effective ways to utilize invaluable natural resources wisely and address ecological problems swiftly.

Literature Review. Issues related to ecological policy occupy an important place in the agenda of the new Uzbekistan. President Shavkat Mirziyoyev's "Green Space" initiative has truly become a nationwide project. Special attention is being given to mitigating the consequences of the Aral Sea crisis, combating dust storms, and stabilizing the socio-ecological situation in the Aral Sea region. At the initiative of our country's leadership, the United Nations General Assembly

adopted a Special Resolution on May 18, 2021, declaring the Aral Sea region as a "zone of ecological innovations and technologies."

In Uzbekistan, several ecological problems have emerged today, and we will highlight some of them. With the increasing water consumption in various sectors of the economy, the average annual water usage remains high in key sectors such as agriculture and industry (including textiles, light industry, food, chemicals, metallurgy, and others). Meanwhile, water scarcity is intensifying due to climate change. The growing population is expected to increase the demand for quality drinking water. The pollution of water bodies (both surface and groundwater) primarily arises from the ineffective operation of wastewater treatment infrastructure. The main sources of pollution include industrial, agricultural, and municipal enterprises. Efforts are being made to reduce water consumption, utilize renewable energy sources, and implement recycling, as well as to establish sustainable solutions for urban and rural populations.

The pollution of the atmospheric air from stationary and mobile sources is worsening under adverse climate conditions. This is largely related to the growth of key sectors such as energy, oil and gas, metallurgy, chemical industry, construction, and the increasing number of vehicles. While carbon monoxide and hydrocarbon emissions in the country are decreasing, nitrogen oxides and particulate matter emissions are on the rise. The majority of emissions come from the energy sector (76%) and agriculture (18%).

Research Methodology. In Uzbekistan, we can observe both negative and positive trends in the management of land resources. Negative trends include desertification processes resulting from natural climatic factors and anthropogenic activities. Positive trends can be seen in the increase of green vegetation areas, the reduction of land allocated for cotton, and the expansion of land for growing vegetables, grains, fruits, and fodder crops. Additionally, there has been an increase in state support for the implementation of water-saving irrigation technologies.

Excessive use of water resources is leading to land degradation and increased desertification. The irrational use of irrigation networks and the aging of water supply infrastructure have contributed to the rapid desertification and drying up of the Aral Sea. This ecological disaster has had negative effects on biodiversity loss, a decline in fish stocks, and the well-being of local populations.

Uzbekistan's water problems are multifaceted, linked to geographic, climatic, economic, and governance factors. The country's arid climate and limited water resources present serious

challenges for sustainable water management. Being located in a dry region of Central Asia, Uzbekistan faces water scarcity.

Although agriculture is one of the key sectors of the national economy, it is highly dependent on the effective functioning of irrigation systems. Inefficient irrigation methods, including outdated infrastructure and technology, lead to excessive water consumption, resulting in wastage and depletion of water resources. The lack of integrated water resource management contributes to their uneven distribution and overconsumption.

Insufficient treatment of industrial waste, agricultural runoff, and wastewater leads to water pollution, affecting both surface and groundwater. Such pollution poses risks to human health and the environment.

Analysis and Results. Data analysis shows that greenhouse gas emissions in Uzbekistan reached 189.2 million tons in 2017, a decrease of 0.6% compared to 2013. The country has committed to reducing carbon dioxide emissions per unit of gross domestic product by 35% by 2030, supported by resources for promoting energy-saving and environmentally safe technologies and funding climate programs.

The ecological problems of the Aral Sea region have gained international significance and have become a global issue. In the second half of the 20th century, the condition of the Aral Sea entered a phase of instability. This has resulted in reduced water volume and flow, increased salinity, a decline in the biological diversity of fish, and other negative processes due to anthropogenic impacts. The shrinking of the Aral Sea significantly affects the ecosystems of all neighboring countries, with its crisis directly impacting Turkmenistan, Kazakhstan, and Uzbekistan—particularly in the Republic of Karakalpakstan, as well as the provinces of Khorezm, Bukhara, and Navoi. If the current trends of salinization of water bodies and soils continue, a significant portion of agricultural land in the Syr Darya basin will become unsuitable for irrigated farming within a few decades, and a similar situation will arise in the Amu Darya basin. Additionally, the pollution of rivers will cause irreparable damage to the region's ecological and socio-economic development.

Discussion of Research Results. The increase in population and the economic development of the country have led to a rise in various types of waste and an increase in per capita waste generation. However, there are opportunities for improving waste recycling in Uzbekistan and reducing both the quantity and types of waste produced. In recent years, investments have

been made to rapidly develop infrastructure related to solid waste management and to increase the level of waste collection.

Despite these efforts, the implementation of waste recycling and disposal technologies remains low, resulting in most waste being sent to landfills. While certain achievements have been made in the field of municipal waste management, problems persist in managing industrial waste. There is no unified system for the storage, transportation, and disposal of medical waste. Additionally, challenges exist regarding the direct collection and processing of electronic waste and batteries.

When it comes to public health, both positive and negative trends can be observed. The health of the population in Uzbekistan has significantly improved, as evidenced by the decrease in child mortality and the reduction in the number of underweight children. Additionally, changes in dietary consumption have led to improved nutrition quality. However, the probability of premature death from the four main groups of non-communicable diseases (cardiovascular diseases, diabetes, chronic respiratory diseases, and cancer) stands at 26.9%, with men at a notably higher risk (32.9%) compared to women (21.4%).

To address the negative impacts of human activities and climate change, a range of measures has been planned and implemented in various regions of Uzbekistan aimed at environmental protection and enhancing well-being. The country actively participates in international efforts for environmental conservation and human development. Uzbekistan is a signatory to 14 international conventions related to environmental protection and sustainable development, as well as over 20 protocols, agreements, and memoranda of understanding. Under the Paris Agreement, Uzbekistan has updated and strengthened its commitments regarding greenhouse gas emissions through to 2030.

Uzbekistan supports the principles of the Rio de Janeiro Declaration and the Agenda for the 21st Century, having adopted 16 national sustainable development goals to be achieved by 2030. This includes defining key areas of the country's activities aimed at providing the population with quality drinking water.

However, the funding for national and international projects focused on environmental protection and improving ecological issues remains very low. Currently, the Ministry of Ecology is implementing 31 international grant projects with a total value of \$106.547 million. Additionally, another 8 international projects with a total value of \$39.8 million are planned for implementation in 2023-2024.

Uzbekistan is witnessing significant growth in its population and economy, which is one of the main factors driving social, economic, and ecological changes. The demand for quality food, water, energy, clean air, and other natural resources is increasing among the population. At the same time, economic growth includes increasing the production of goods and services, raising the population's income, and contributing to regional and global development.

Conclusion and Recommendations. Addressing the aforementioned and other regional ecological problems, as well as reducing their impacts, will ensure the socio-economic development of the region and achieve sustainable growth. To this end, it is necessary to develop proposals based on scientific analysis of the causes of existing ecological problems, aimed at reducing and eliminating their effects. The author suggests the following approaches to mitigate the impact of ecological issues:

- Regulating land and water use and implementing innovative, resource-efficient methods for utilizing natural resources.
- Financing projects aimed at solutions to ecological problems and establishing grant competitions in this area.
- Empowering local authorities to prioritize the funding and announcement of grants for environmental projects, based on the specific characteristics of their regions.
- Promoting ecological awareness through impactful projects tailored to different age groups within communities.
- Strengthening environmental oversight and accountability for environmental violations, increasing fines, and ensuring that the "polluter pays" principle is included in all regulatory documents. We propose the introduction of environmental and carbon taxes in Uzbekistan.
- Improving organizational and economic mechanisms to enhance efficiency in addressing ecological problems, with a focus on the principle of public-private partnerships.
- It is recommended to establish a "Special Council for Sustainable Ecological and Economic Development" in all regions and to operationalize its activities. This council should include various specialists and scientists, facilitating a comprehensive approach to finding solutions to ecological problems. This will allow for a holistic assessment of issues and the proposal of viable solutions.

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