

OPPORTUNITIES FOR DEVELOPING BIOECONOMY AND CIRCULAR ECONOMY IN UZBEKISTAN AND THE IMPORTANCE OF THEIR EFFECTIVE UTILIZATION

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Abstract: This article discusses the existing opportunities in the fields of bioeconomy and circular economy in Uzbekistan, their development prospects, and the issues related to their effective implementation. The research explores the main principles of bioeconomy and circular economy, international experiences, and strategies required for the development of these sectors in Uzbekistan. Additionally, the impact of these sectors on the country's economic and ecological development is analyzed.

Keywords: bioeconomy, circular economy, economic efficiency, ecological benefit.

Introduction. In Uzbekistan, developing strategies based on the principles of bioeconomy and circular economy is a crucial issue to ensure sustainable economic growth, rational use of natural resources, and address ecological problems.

Currently, the world economy is transitioning to a new model based on ecological sustainability and the rational use of natural resources. Through the implementation of these economic models, Uzbekistan has the opportunity to make more efficient use of natural resources, reduce ecological burdens, and achieve economic stability. The country's agriculture, industry, and energy sectors have significant potential for implementing the principles of bioeconomy and circular economy.

So, what are bioeconomy and circular economy?

Bioeconomy is a system aimed at ensuring economic development through the efficient use of biological resources (plants, animals, microorganisms) in sectors such as industry, agriculture, medicine, and energy. It includes ecological technologies, renewable energy sources, and biotechnology.

Circular economy is a system based on increasing economic efficiency through waste reduction, recycling, and reuse of resources. Its goal is to create an ecologically sustainable economy based on the principle of «production → consumption → recycling.»

The importance of effectively utilizing bioeconomy and circular economy includes:

Economic benefits: reducing dependency on imports by efficiently using local resources, creating new jobs, fostering innovative entrepreneurship, and increasing export potential through organic farming in agriculture.

Ecological benefits: reducing air pollution and preserving the natural environment through recycling waste, conserving biodiversity, using natural resources sustainably, and achieving ecological stability through effective management of water and soil resources.

Social importance: enhancing public ecological awareness, improving living conditions, expanding local scientific research and innovation centers, and introducing modern technologies through government and private sector collaboration.

Methodology. In this study, scientific and technical literature, as well as international and national statistical data, were analyzed. Additionally, the economic and ecological conditions of Uzbekistan, existing resources, and the possibilities of implementing the principles of bioeconomy and circular economy were examined. The research involved theoretical analysis (studying the essence and main principles of bioeconomy and circular economy) and statistical analysis (analyzing the country's existing natural resources, waste recycling rates, and indicators of the use of alternative energy sources).

Results. Uzbekistan has significant opportunities for the development of bioeconomy and circular economy. To begin with, the opportunities in the bioeconomy sector include agriculture and the food industry (increasing soil fertility and producing ecologically pure products through the production of

biological pesticides and organic fertilizers), biotechnology (growing genetically unmodified, high-yielding agricultural products), renewable energy (increasing energy independence through the use of biofuels, biogas, and biomass), and the cultivation of medicinal plants (developing the pharmaceutical industry by utilizing Uzbekistan's plant diversity).

The opportunities in the circular economy sector are as follows: introducing modern technologies for sorting and recycling plastic, paper, glass, and electronic waste, expanding water conservation through drip irrigation and the treatment of purified wastewater, and implementing ecological technologies in industrial sectors aimed at achieving minimal waste and maximum productivity.

Discussion. Uzbekistan has a high potential for development in the fields of bioeconomy and circular economy. The implementation of bioeconomy principles in the country's agricultural and industrial sectors will reduce dependence on imports and create new job opportunities. The application of circular economy principles, on the other hand, will ensure ecological sustainability by reducing waste and ensuring efficient resource use. Moreover, international experiences show that the successful implementation of these principles requires strong government policies and support from the private sector.

Developing bioeconomy and circular economy sectors in Uzbekistan is a crucial factor for achieving economic growth and ecological sustainability. To achieve this, it is necessary to support biotechnology and environmentally friendly production methods, improve the recycling industry and waste management systems, widely implement modern technologies that conserve natural resources, and encourage research on bioeconomy and circular economy while studying advanced foreign experiences.

Conclusion. Thus, the development of bioeconomy and circular economy serves as one of the key directions for ensuring sustainable economic growth and ecological balance in Uzbekistan. Through the development of bioeconomy and circular economy, the country can address its economic and ecological challenges.

The efficiency of these sectors needs to be increased by introducing innovations, expanding public-private partnerships, and developing scientific research. Implementing the principles of green economy and ecological sustainability will contribute to Uzbekistan's sustainable development.

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