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THE ROLE OF INNOVATIVE TECHNOLOGIES IN MANAGEMENT IN ADVANCING THE GREEN ECONOMY

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Abstract

This article analyzes the theoretical and practical aspects of developing a green economy through the use of innovative technologies in the management system. The importance of innovative management tools in increasing economic efficiency, rational use of resources, ensuring energy saving, and strengthening environmental sustainability is highlighted. In addition, the impact of digital technologies, automated management systems, and environmental monitoring tools on the development of the green economy is studied. As a result of the research, priority directions of innovative approaches for the development of the green economy in the country are substantiated.

Keywords: Innovation, management, green economy, technology, ecology, digitalization, efficiency, resources, sustainability, monitoring.

Introduction

In today’s global economy, ensuring environmental sustainability, rational use of natural resources, and reducing negative environmental impacts have become increasingly urgent issues. In this regard, the development of green economy principles and their effective integration into management systems is considered one of the priority directions of modern economic policy. In our country as well, large-scale reforms are being implemented aimed at modernizing economic sectors, introducing energy-efficient technologies, utilizing renewable energy sources, and ensuring environmental safety.

Under current globalization conditions, the application of innovative technologies in management processes enhances economic efficiency, promotes resource conservation, and strengthens competitiveness. In particular, the development of digital management, automation, artificial intelligence, and information and communication technologies serves as a key factor in the practical implementation of green economy principles.

At the same time, the effective use of innovative technologies in management enables enterprises and organizations to reduce energy consumption, minimize waste, optimize production processes, and ensure environmental sustainability. This, in turn, contributes to sustainable economic growth, increased investment attractiveness, and improved living standards.

Literature Review

Numerous scientific studies conducted by national and foreign economists, ecologists, and management specialists have developed important theoretical and practical approaches to the use of innovative technologies in green economy and management systems. In particular, the works of scholars such as S. G‘ulomov, B. Begalov, Q. Abdurahmonov, A. Vahobov, Sh. Mustafakulov, as well as foreign researchers J. Stiglitz, M. Porter, N. Stern, P. Hawken, and Lester Brown, highlight the significance of the green economy, environmental management, and innovative technologies in economic development.

The studies of S. G‘ulomov and B. Begalov on digitalization and the introduction of information technologies into management processes substantiate the importance of innovative technologies in improving economic efficiency. Their scientific views emphasize the efficient use of resources through the implementation of digital economy and intelligent management systems.

The research of Q. Abdurahmonov and A. Vahobov focuses on economic development and sustainable growth, analyzing mechanisms for modernizing the national economy, improving energy efficiency, and ensuring environmental safety. Their work highlights the role of innovative approaches and investment activity in achieving economic growth.

Among foreign scholars, J. Stiglitz and N. Stern have elaborated the theoretical foundations of the green economy concept, carbon emission reduction, and the integration of environmental policy into economic management. In addition, M. Porter’s theory of competitive advantage emphasizes that high performance in organizational activities can be achieved through innovation and environmental efficiency.

The works of P. Hawken and Lester Brown examine the impact of renewable energy sources, energy-saving technologies, and environmentally oriented innovative projects on economic development. These studies substantiate the importance of applying innovative management models to ensure environmental sustainability.

Research Methodology

This article examines the theoretical and practical aspects of developing the green economy through the use of innovative technologies in management systems. In particular, the mechanisms for increasing economic efficiency, ensuring rational use of resources, improving energy efficiency, and achieving environmental sustainability through the implementation of innovative technologies in management processes are analyzed.

The study explores the significance of the green economy concept in economic management, as well as the impact of modern digital technologies, automation systems, and intelligent management tools on the performance of enterprises and organizations. Additionally, issues such as optimizing production processes, reducing waste, and ensuring environmental protection through the application of innovative technologies are considered.

The research employs methods such as a systematic approach, economic analysis, comparison, grouping, statistical observation, and scientific abstraction. Through these methods, the impact of innovative technologies in management on the development of the green economy is assessed, and priority directions for improving the sector are identified.

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In the context of globalization, the introduction of innovative technologies into economic management systems is one of the key factors of modern development. Innovative technologies provide new approaches to management, increase efficiency, and enable the rational use of resources. In particular, the advancement of digital technologies, automated management systems, artificial intelligence, and information and communication tools contributes to the effective implementation of green economy principles in practice.

The green economy is a model aimed at the rational use of natural resources, maintaining ecological balance, and ensuring economic growth, in which innovative technologies play a crucial role. The application of innovative technologies in management allows for optimizing production processes, reducing energy consumption, minimizing waste, and ensuring environmental safety. This not only improves the economic efficiency of enterprises and organizations but also has a positive impact on environmental protection.

The effectiveness of innovative management technologies is determined by their practical outcomes. Modern management tools enable the creation of energy-efficient production systems, strengthening environmental monitoring, and controlling the use of production resources. Moreover, the use of innovative technologies in management improves the quality of strategic planning, reduces risks, and enhances competitiveness.

In the development of the green economy, renewable energy sources, "smart" management systems, environmental monitoring programs, and digital management platforms are of particular importance. These tools make it possible to achieve both economic and environmental efficiency simultaneously. Furthermore, the digitalization of production processes based on innovative technologies increases resource efficiency and environmental responsibility of enterprises.

Maintaining harmony between humans and nature and ensuring the efficient use of natural resources are the main goals of the green economy. Natural resources are the primary source of human life, and their rational and balanced use ensures sustainable economic development. Therefore, through the effective use of innovative technologies in management systems, it is possible to achieve not only economic growth but also environmental sustainability.

Human well-being is also governed by its own laws and principles. Both humans and nature must function in accordance with these laws and regulatory frameworks. As the Russian scientist Prof. M. Ya. Lemeshev noted, "Humanity must live and develop according to the laws of nature. If humans fail to consider these laws, nature will punish them." A clear example of this can be seen in the impact of current climate change on the economy (Table 1).

Table 1 Projected Global Temperature Increase Scenarios and GDP Losses Under Their Impact

Region	**Below 2°C (Paris Agreement)**	**Above 2°C**	**Above 2.6°C**	**Above 3.2°C**
World (GDP)	- 4,2 %	- 11,0 %	- 13,9 %	- 18,1 %
North America	- 3,1 %	- 6,9 %	- 7,4 %	- 9,5 %
South America	- 4,1 %	- 10,8 %	- 13,0 %	- 17,0 %
Europe	- 2,8 %	- 7,7 %	- 8,0 %	- 10,5 %
Middle East and Africa	- 4,7 %	- 14,0 %	- 21,5 %	- 27,6 %
Asia	- 5,5 %	- 14,9 %	- 20,4 %	- 26,5 %

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Analysis and Main Results

The most significant impact of climate change is that if the global temperature rises by 3.2°C, the world economy could lose up to 18% of its GDP by 2050. According to these forecast scenarios, the impact of climate change is expected to be most severe for the economies of Asian countries. In particular, GDP losses are projected to be 5.5% under the best-case scenario and up to 26.5% under the worst-case scenario.

The above analysis reflects only the impact of global temperature rise. However, when considering other human activities affecting nature—such as environmental pollution (waste and greenhouse gas emissions) and the destruction of green ecosystems (deforestation)—it becomes evident that the consequences could be even more severe.

Therefore, the global community has initiated practical steps to transition from a “brown” economy, characterized by high carbon emissions and environmental degradation, to a “green” economy aimed at reducing pollution, increasing energy and resource efficiency, preventing biodiversity and ecosystem loss, and ensuring sustainable human well-being.

The President of our country, Sh. M. Mirziyoyev, has also emphasized that the transition to a green economy is one of the most pressing issues of our time. In particular, his speeches at the 76th session of the United Nations General Assembly, as well as at the “European Union–Central Asia Connectivity: Global Gateway for Sustainable Development” forum, along with initiatives such as the afforestation of the Aral Sea region and the “Yashil Makon” (Green Space) program, highlight the importance of this direction.

Furthermore, according to the Presidential Decree “On the Development Strategy of New Uzbekistan for 2022–2026,” it is planned to increase the energy efficiency of the economy by 20% and reduce harmful emissions by 20% by 2026 through the active implementation of green economy technologies in all sectors. In addition, the “Uzbekistan–2030” Strategy, approved by Presidential Decree No. PF-158 dated September 11, 2023, defines Goal 51 as accelerating the transition to a green economy by significantly increasing the use of renewable energy sources. Specifically, it sets targets to increase renewable energy capacity to 25,000 MW, raise its share to 40% of total energy consumption, develop the market for green certificates, and introduce environmental labeling practices.

On December 2, 2022, Presidential Resolution No. PQ-436 “On Measures to Improve the Effectiveness of Reforms Aimed at the Transition of the Republic of Uzbekistan to a Green Economy by 2030” was adopted. Based on this resolution, a program for transitioning to a green economy and ensuring green growth by 2030 was developed.

This program outlines several key targets, including:

- reducing greenhouse gas emissions per unit of GDP by 35% compared to 2010 levels;
- increasing renewable energy production capacity to 15 GW and raising its share to more than 30% of total electricity generation;
- significantly improving water use efficiency across all sectors and introducing water-saving irrigation technologies on up to 1 million hectares;
- planting 200 million trees annually and expanding urban green areas to over 30% by increasing the total number of trees to more than 1 billion.

The implementation of these measures has already begun. In particular, on December 27, 2023,

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President Shavkat Mirziyoyev participated in the commissioning ceremony of five solar and one wind power plant in the Jizzakh, Samarkand, Surkhandarya, Bukhara, and Kashkadarya regions. The first phase of these projects, with a total capacity of 2,400 MW, has been launched. The investment partners include Masdar (UAE), China Energy Engineering Corporation, China Energy International Group, China Gezhouba Group, and SEPCO III, Dongfang Electric Corporation.

Conclusion and Recommendations

The effective use of innovative technologies in management systems is one of the key factors in the development of a green economy. Through the digitalization of modern management mechanisms and the introduction of innovative solutions in production and service sectors, it is possible to enhance economic efficiency, ensure rational use of natural resources, and achieve environmental sustainability.

To expand the implementation of green economy principles and improve management efficiency in this direction, the following measures are recommended:

First, it is necessary to widely implement digital management systems, automated monitoring platforms, and intelligent analytical tools across all sectors of the economy. This will enable better control of energy consumption, reduction of production costs, and minimization of environmental impact.

Second, it is important to develop the innovative thinking and digital skills of personnel working in the management sector. For this purpose, higher education institutions and training centers should improve specialized curricula in innovative management, environmental management, and green economy.

Third, it is advisable to thoroughly study foreign experience in the transition to a green economy and adapt it to national economic conditions. In particular, effective use of best practices in renewable energy, smart cities, green transport, and waste management is essential.

Fourth, it is necessary to establish effective cooperation mechanisms between the state, private sector, and the population in addressing environmental issues and developing the green economy. This includes introducing economic incentives for efficient resource use, tax benefits, subsidies, and strengthening liability for non-compliance with environmental standards.

In addition, strengthening research activities in the field of innovative management and green economy, as well as establishing specialized research centers and analytical institutions, will ensure strategic development in this area. This, in turn, will contribute to sustainable economic growth and environmental security through the widespread implementation of innovative technologies across all sectors of the economy.

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