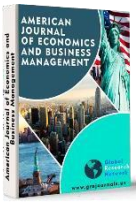

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Article

Global Green Economy: A Key Challenge for Achieving Environmental Stability Worldwide

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Abstract: This study addresses the global shift toward a green economy, a critical challenge in the context of globalization, as environmental issues continue to rank among the most urgent global concerns. While previous research has examined various environmental policies, a knowledge gap remains in understanding effective national-level strategies for transitioning to eco-friendly economic practices. The research aims to identify and evaluate these strategies, focusing on mitigation approaches for environmental challenges. Using a comparative analysis of global case studies, the study finds that adopting green policies not only enhances sustainability but also promotes economic resilience. The findings have significant implications for policymakers seeking to balance economic growth with environmental responsibility.

Keywords: Ecology, Environmental conservation, Ecological crisis, Environmental challenges, Advanced technology, Sustainable economy, Green economy.

1. Introduction

Similar to other developed nations, Uzbekistan bears the responsibility of protecting the environment for future generations. However, many businesses today pay insufficient attention to the economic value of conserving natural resources and preventing environmental harm in their operations. There is a perception that producing eco-friendly goods imposes additional costs on businesses. When companies fail to follow environmental laws and avoid accountability, it reflects poor managerial practices. The absence of effective oversight leads to adverse ecological and social impacts, such as air and water pollution, loss of biodiversity, and ecosystem degradation, posing risks to public health. These issues disrupt sustainable development and exacerbate environmental degradation. It is more effective to prevent environmental harm than to compensate for damages afterward.

Key priorities include maintaining ecological balance, promoting the green economy, expanding the use of renewable and alternative energy, improving energy efficiency, and enhancing public health through better waste management and recycling practices. As part of the ongoing reforms, Uzbekistan follows its Strategy for transitioning to a green economy while steadily advancing environmental policies. The implementation of state programs is aligned with the national Environmental Protection Concept, which outlines objectives up to 2030. The primary goal of the green economy initiative is to introduce measures that promote environmental conservation and ensure sustainable economic growth.

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The President of Uzbekistan, Shavkat Mirziyoyev, remarked that ecological challenges are increasing both globally and within the country. He highlighted that these issues arise partly from natural causes but, more often, from human activities. Over the past four years, the number of industrial enterprises in the country has doubled, resulting in dust and gas emissions in urban areas exceeding acceptable levels by four times. Additionally, green spaces in various regions have diminished by three to four times, and both surface water availability and underground water levels have declined [1]

To achieve ecological stability, Uzbekistan aims to ensure the responsible management of natural resources, improve living standards for current and future generations, and foster a prosperous society by embracing green development principles. Addressing the ecological crisis requires stabilizing the environment, preserving natural ecosystems, and ensuring the sustainable use of land and water resources. Furthermore, safeguarding these resources for future generations is essential. A significant priority is to drastically reduce environmental waste, with a focus on the effective and cost-efficient disposal of harmful materials.

Literature Review

The President of Uzbekistan issued a decree approving the "Development Strategy of New Uzbekistan for 2022-2026." This strategy places significant emphasis on advancing environmental initiatives at the international level, including efforts to develop a World Environmental Charter [2]. Uzbekistan began its transition toward a green economy in October 2019, following the adoption of the "Strategy for the Transition to a Green Economy of the Republic of Uzbekistan for 2019-2030," just before the onset of the COVID-19 pandemic. This strategy aims to lower greenhouse gas emissions by enhancing energy efficiency, promoting the use of renewable energy, improving resource management, boosting agricultural productivity, and curbing land degradation [3].

Prioritizing human well-being at the cost of environmental degradation will inevitably result in harmful consequences in the near future [4]. The only viable solutions to this challenge are adopting an ecological economy or transitioning to a green economy. S. Plekhanov emphasized the importance of gradually adopting a green economy. Countries such as the United States, South Korea, Germany, Sweden, Denmark, the Netherlands, and other developed nations are already making strides toward green economic models [5]. Walter Kahlenborn highlighted that the green economy plays a crucial role in the German industry. He emphasized the need to identify emerging markets and key innovations, alongside implementing research and innovation policies. These efforts leverage available opportunities to expedite Germany's transition toward a green economy [6].

D. Beck, E. Nel, and their colleagues noted that the shift toward a green economy, along with technological advancements, is impacting society as a whole. To successfully integrate these new technologies, it is essential to develop effective policies that optimize their implementation, ensuring that technological changes are applied efficiently [7]. N. Vukovich’s general economic perspective on the green economy emphasizes the need to revisit sustainable development challenges and adopt an integrated approach. This approach helps identify the key connections between ecology, the economy, society, and the green economy [8], Karl Burkart views the green economy as a fundamental component of the interconnected management of ecology, economy, and society [9]. He argues that the green economy aims to establish a balance that considers the benefits within this integrated social, ecological, and economic framework.

2. Materials and Methods

Achieving ecological balance across all sectors of the economy involves the responsible management of limited natural resources, efficient energy use, and reducing production costs through the adoption of low-emission technologies. Transitioning to a

green economy relies heavily on scientific advancements and innovations to promote societal stability and sustainable economic growth. The principles of the green economy are outlined through presidential decrees, policy decisions, and the insights of economists. This article was prepared using methods such as literature review, data analysis, and comparative studies.

3. Results and Discussion

Economic activities do not inherently impact the environment unless certain practices are employed. However, environmental risks can hinder economic progress. The excessive exploitation of natural resources, failure to integrate modern technologies into production processes, and the improper disposal of toxic waste have contributed to public health deterioration worldwide.

Economic relations play a vital role in human development, with national progress depending on the effective use of technology, responsible management of natural resources, biodiversity conservation, and environmental stewardship for future generations. To foster global economic growth, it is essential to align environmental efforts with economic priorities, maximizing the benefits. For instance, Uzbekistan's "Development Strategy of New Uzbekistan for 2022-2026" emphasizes the importance of environmental initiatives, including the development of a World Environmental Charter [2].

Adopting a green economy provides opportunities for economic growth while addressing environmental challenges. This transition requires the implementation of comprehensive policies that integrate green practices across society. Responsible use of natural resources, preventing environmental and social harm, and investing in sustainable initiatives, even beyond immediate financial benefits, are crucial for long-term reforms. Every country should develop socio-economic strategies that promote a green economy to ensure social stability by encouraging investment in environmental indicators and resource management.

Economic activities alone are not inherently harmful; the real issue lies in neglecting the ecological systems that support them. Current environmental challenges, such as the expansion of economic activities, climate change, and biodiversity loss, require urgent efforts to control emissions from resource consumption. Fostering a green economy not only ensures sustainable growth but also strengthens political, social, and economic stability, laying the foundation for strategic, long-term development.

When establishing international cooperation to address global environmental challenges, several key areas require attention:

1. Developing a framework for international collaboration on the sustainable use and protection of natural resources, while creating favorable natural, social, economic, and political conditions.
2. Strengthening national environmental policies by incorporating insights from advanced international practices.
3. Crafting agreements and programs to foster global cooperation in environmental protection.
4. Uzbekistan’s interstate ecological efforts focus on enhancing environmental conditions at the local, national, regional, and global levels.

To achieve sustainable development, it is essential to enhance the ecological capacity of the biosphere while utilizing it responsibly. Economic growth and increased consumption are the primary drivers of the ecological crisis. Therefore, minimizing the negative impacts of these trends is crucial to resolving the crisis. The only viable solution lies in shifting to an ecological or green economy, which emphasizes energy-saving products and the use of alternative energy sources.

At the 2012 UN Conference on Sustainable Development, known as "Rio + 20," UN Secretary-General Ban Ki-moon declared that humanity is entering a new era. He

predicted that by 2040, the global population would grow to 9 billion, rendering the traditional socio-economic development model obsolete. According to the conference report, by 2030, global food demand will increase by 50%, electricity demand by 45%, and water resource demand by 30%. To meet these rising needs, Ban Ki-moon stressed the urgent need to adopt a green economy. Today, countries such as the United States, South Korea, Germany, Sweden, Denmark, the Netherlands, and others are gradually transitioning to green economic models [5]. The shift toward a green economy not only stimulates economic growth but also promotes the production of environmentally friendly products and improves public health.

Addressing environmental threats requires collaborative efforts from the global community. The United Nations plays a crucial role in promoting peace, cooperation, and sustainable development worldwide. Through dialogue, partnership, and solidarity, nations can pool their resources and creativity to address pressing challenges. This vision was reflected in the Millennium Development Goals, adopted until 2015, and later in the Sustainable Development Goals introduced in 2016.

A core principle of sustainable development is ensuring that all forms of economic activity align with green practices. However, assessing industrial compliance with environmental standards remains challenging, as it involves estimating how much each entity invests in environmental projects. Key indicators—such as environmental costs, gross national product (GNP), and budget revenues and expenditures—allow for comparisons with overall economic investments. A statistical analysis of the ratio of environmental costs to GDP is presented in Table 1.

Table 1. The share of environmental costs in relation to the gross domestic product (GDP)

Indicators	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Environmental costs in large enterprises (billion soums)	385,4	369,7	393,2	394,8	618,8	573,6	763,1	952,9
Environmental costs in micro-firms and small enterprises (billion soums)	12,5	5,7	6,8	15	30,2	32,2	42,6	49
Total environmental costs (billion soums)	397,9	375,4	400	409,8	649	605,8	805,7	1001,9
GDP (billionsoums)	153311,3	186829,5	221350,9	255421,9	317476,4	424728,7	529391,4	602551,4
The share of environmental costs in relation to GDP, (%)	**0,26**	**0,20**	**0,18**	**0,16**	**0,20**	**0,14**	**0,15**	**0,17**

According to Table 1, the proportion of total environmental costs incurred by economic entities within the republic relative to the gross domestic product (GDP) is illustrated. In 2022, environmental expenditures by large enterprises increased by 567.5 billion soums, marking a 247.2% rise compared to 2015. Similarly, environmental costs in micro-firms and small enterprises grew by 36.5 billion soums, reflecting a 392.0% increase. Over the same period, GDP expanded by 449,240.1 billion soums, a 393.0% rise, mirroring the proportional increase in environmental expenses.

However, despite these increases, the share of environmental costs relative to GDP dropped from 0.26% in 2015 to 0.17% in 2022. This decline is attributed to the fact that GDP growth outpaced environmental spending, suggesting that businesses are not giving sufficient priority to environmental costs. In summary, the share of environmental expenses relative to GDP decreased by 0.09 percentage points from 2015 to 2022.

This reduction in environmental spending as a share of GDP is not a favorable development. In a green economy driven by innovative technologies, environmental expenditures are expected to grow continuously and influence GDP positively. Producing environmentally sustainable goods and services requires a thoughtful increase in environmental spending, which should ideally keep pace with GDP growth.

We will examine the relationship between environmental costs and GDP over past years using the autocorrelation method. This approach helps identify trends and dependencies over time. The analysis of environmental expenses as a proportion of GDP, based on historical data, is presented in Figure 1.

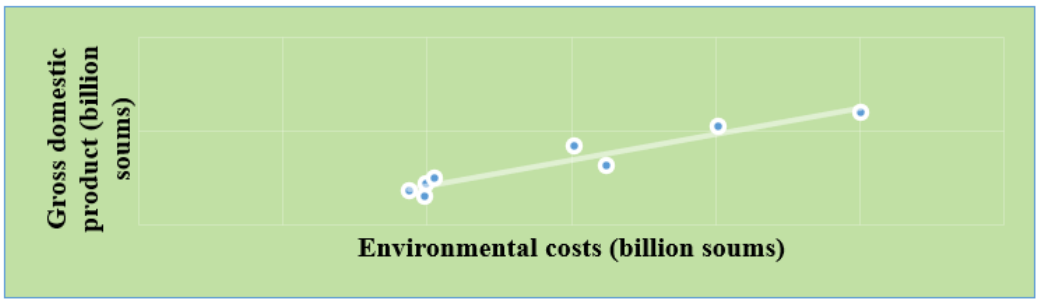

Figure 1. Dependence of environmental costs on macroeconomic indicators

According to Figure 1, the change of environmental costs over the years in economic entities is almost in the form of a straight line. Its regression equation is y=674.1x - 63498.7. Given that the linear correlation coefficient takes values from -1 to +1, the connections between the studied relationships can be weak or strong. Their criteria are determined according to the following scale.

0.1<rt,t-1 <0.3: weak;

0.3<rt,t-1 <0.5: average;

0.5 < rt,t-1 < 0.7: significant;

0.7 < rt,t-1 < 0.9: high;

0.9 < rt,t-1 < 1: very high.

The correlation coefficient between environmental costs and GDP was equal to 0.97. This situation can be seen from the following formula.

$$r_{x,y} = b \cdot \frac{S(x)}{S(y)} = 674{,}1 \cdot \frac{223{,}47}{154890{,}63} = 0{,}97 \quad (1)$$

In this we can see that the correlation is high and correct.

It is necessary to find the coefficient of elasticity to determine the percentage change in GDP if environmental costs change by 1 percent. It is defined as:

$$E = \frac{dy}{dx} \cdot \frac{\bar{x}}{\bar{y}} = 674{,}1 \cdot \frac{593{,}2}{336382{,}8} = 1{,}19 \quad (2)$$

It can be seen that a 1 percent change in environmental spending leads to a 1.19 percent increase in GDP.

The author developed a forecast for the following years using the above information and the autocorrelation analysis of environmental costs over the years.

Table 2. Dependence of environmental costs on macroeconomic indicators and their forecast (in billion soums)

Indicators	2021 й.	2022 й.	2023 й.	2024 й.	2025 й.	2026 й.
Environmental costs	1077,4	1152,9	1228,4	1483,11	1594,2	1729,2
GDP	662776,6	713671,2	764565,7	936265	1011166	1102171

Environmental costs in relation to gross domestic product

When the share of 2016-2020 is studied, although environmental costs have increased quantitatively, their share in relation to GDP has decreased. When predicting the dependence of environmental costs on macroeconomic indicators on the basis of statistical indicators of previous years. In 5 years, the total environmental costs in the Republic of Uzbekistan will increase to 651.8 billion soums or 160.5%, and the volume of GDP will increase to 439394.4 billion soums by 2026 and 166.3% compared to 2020. That is, in proportion to the growth of GDP in the republic, it is predicted that the volume of environmental expenses will also grow in this proportion. This will contribute to increasing attention to the further modernization of economic sectors in the future, reducing the release of harmful and harmless waste, and ensuring the production of ecologically clean products and services in the globalizing world.

The importance of directing investments in fixed capital aimed at environmental protection and rational use of natural resources is confirmed by the costs of atmospheric air protection. Based on the amount of costs, it is important to consider them objectively, in their grouping and economic analysis, to create a green economy, to develop measures to reduce emissions into the atmosphere by business entities, and to preserve biodiversity. The transition to the "green" economy requires a long period of transformation and modernization of the existing economy in the country, a period of structural and technological changes, as well as the formation of a new model. In this regard, it is important to pay special attention to accounting for environmental costs and to radically increase the efficiency of using natural resources during such a transition period. Two directions can be distinguished here.

First, it is necessary to strengthen the effectiveness of state regulation of nature management in the field of resource extraction and use. Using economic and legal means (taxes, levies, tariff policy, fines, compliance with norms and standards, etc.) to increase the efficiency of the use of natural resources, to prevent their disappearance, to compel state and private monopoly enterprises to compensate for the damage and expenses caused to the development of society and nature need. Secondly, to create a competitive environment during the transition period, to strengthen the competitive environment among producers and to take measures to get rid of the monopoly in the energy sector and the economy as a whole. In addition to cost reduction, these factors stimulate economic entities to innovate, modernize production, process raw materials, increase energy efficiency, introduce new technologies, and increase the production volume of products.

It is known from world practice that it is directly related to the focus on environmental relations in determining the country's economic development indicators. Investments are especially important for the environment. To ensure the quality level of the country's economic growth, to create an environment of innovation in the environmental field, covering a wide range of techniques, technology, plant protection, infrastructure formation and other factors. In addition, "Green economy" is one of the means of attracting foreign and domestic investments in the development of complex economic and social sectors of the economy and improvement of ecological sectors. It serves to further expand the scale of production of environmentally friendly products. In our republic, special attention is paid to the development of the field of ecology, as can be seen from Table 3below.

Table 3. The main invectives aimed at environmental protection (in billion soums)

Investments aimed at environmental protection and rational use of natural resources*							
2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
1741,1	165,9	240,0	352,2	62,1	77,8	528,0	165,9

The data of this table shows the dynamics of the volume of the main investments aimed at the protection of the natural environment on the scale of our republic. The highest figure for this type of investment in 2021 was 528.0 billion. amounting to 352.2 billion soums in 2018. soums, and in 2017 240.0 billion. we can see that soum has been allocated. Compared to these years, we can see that less funds are allocated for these investments in other years. In particular, in 2015, 1741.1 bln. soums, 165.9 billion in 2018. 62.1 billion soums in 2019. soums, and in 2018 77.8 billion. and 165.9 billion soums in 2022. amounted to soum. In this case, the indicator in 2022 compared to 2021 is 362.1 billion. soum is less directed. We can conclude from this that, as indicated above, we can positively evaluate the funds allocated for the main investments aimed at protecting the natural environment in our republic in 2015-2019 and 2021. It is desirable to allocate more funds for this type of investment in the following years.

This will contribute to increasing attention to the further modernization of economic sectors in the future, reducing the release of harmful and harmless waste, and ensuring the production of ecologically clean products and services in the globalizing world. Therefore, in the period between 2021 and 2026, the situation of decreasing environmental protection expenses along with the increase of GDP cannot be evaluated as positive. Since environmental costs are inversely related to the economic entity's production costs, an increase in these costs relative to GDP means that the economic entity has upgraded its technologies. Therefore, the growth of environmental costs in large industrial enterprises in relation to GDP serves to improve the health of the population while ensuring a green economy.

The fact that the activities of economic entities have an impact on the environment is causing public concern, because the development of measures to reduce the negative impact of economic entities on the environment is one of the urgent issues facing the government and society. The concept of green economy requires attention to sustainable development and the use of modern technologies. This will serve as a legal and economic tool for efficient use of resources and implementation of environmental policy in the future. At the current stage of the country's economic development, one of the main documents for making medium and long-term strategic decisions of the country is to abandon the raw material model of the economy.

This task is also central to the concept of the green economy. It serves to facilitate and accelerate the country's transition to a green economy by creating an environmentally sustainable and balanced economic reform and an appropriate economic environment at the macro level. In the development of the economy, environmental regulations set by the government are reflected in the recognition and use of real opportunities in a number of important sectors of private business during the transition to a green economy. The state responds by investing in the greening of the economy while implementing reforms in the field of environmental policy.

However, it is of great importance for Uzbekistan to coordinate national activities with international organizations and to incorporate the principles of international agreements into the legal framework and practice of economic decision-making. In order to ensure environmental stability, it is necessary to create an image of the economic entity, for example, to attract the interest of foreign investors, to drastically reduce the amount of

toxic waste released into the environment, to eliminate the damage to the environment, and to create an ecologically healthy environment by ensuring and eliminating ecological stability.

Business entities should change their attitude towards the environment and adopt an ecological culture. Consequently, the reduction of environmental costs by business entities, in turn, is a sign of a decrease in their relationship to the environment. The increase in the scale of these costs, unlike the production costs of economic entities, serves to reduce environmental pollution and ensure sustainable development of the economy. In particular, taking into account the costs of pollution prevention, environmental protection and resource processing will lead to the expansion of the production scale of economic entities and increase in efficiency.

It is necessary to expand the scope of production of ecologically clean products based on the implementation of ecological costs, to use advanced foreign experiences in reducing costs. Transition to international standards, consideration of environmental costs in the practice of "green economy" and environmental audit as a factor monitoring the development of a sustainable economy should be further improved. A modern presentation of accounting and reports in an efficient economy increases the momentum in the real sectors of the domestic economy and attracts new investors who contribute to solving issues related to sustainable economic development.

4. Conclusion

The study concludes that transitioning to a green economy is a vital yet complex challenge for nations, requiring significant changes in resource management, energy efficiency, and the adoption of low-emission technologies. Findings indicate that Uzbekistan's efforts, guided by the Strategy for the Transition to a Green Economy, emphasize reducing environmental degradation while ensuring sustainable economic growth. The key strategies identified include expanding renewable energy use, improving waste management, and enhancing public health through environmental reforms. The study highlights the need for continued policy development and technological innovations to fully realize the potential of green economies. Further research should explore the long-term economic impacts of these strategies, particularly in developing nations, and assess the role of international cooperation in promoting global ecological stability.

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