Sustainable Economic Development and Principles of Green Economy of Uzbekistan in 2017-2024

Khodjieva Dilrabo[1,*]
[1]Tashkent state University of Economics, Uzbekistan
Email: hojiyevadilrabo7@gmail.com

Abstract

The study examines Uzbekistan's economic development and the implementation of green economy principles from 2017 to 2024. During this period, the country achieved notable progress in economic diversification, the adoption of renewable energy sources, and ensuring environmental sustainability. Nevertheless, challenges such as waste management and the efficient use of water resources remain pressing issues that require future attention and resolution.

Keywords: Green Economy; Renewable Energy; Economic Stability; Environmental Protection; Waste Recycling; Natural Resources

1. Introduction

After gaining independence, the Republic of Uzbekistan has gone through various stages in its economic development. In the early years of independence, the main sectors of the economy were dependent on raw material exports, which made the country's economic development vulnerable to fluctuations in the global market. However, since 2017, Uzbekistan has initiated new reforms aimed at diversifying the economy, modernizing industry, and ensuring economic stability. At the same time, the issue of maintaining ecological balance and implementing the principles of a green economy has also become a pressing matter in the process of economic development.

In recent years, the transition to a green economy has gained significant importance at the international level due to global economic changes, climate change, and the depletion of natural resources. According to the World Bank's 2022 estimates, instability in the global economy has also affected Uzbekistan's economy. While the country's gross domestic product (GDP) growth rate was 1.6% in 2020, it reached 7.4% in 2021. The increase in export volume and the recovery of domestic demand played an important role in this growth [1]. At the same time, ensuring environmental safety and the rational use of natural resources have become important issues in the process of economic development.

The traditional economic model often harms the environment. Excessive extraction and processing of raw material resources have increased the amount of harmful gases released into the atmosphere, thereby accelerating the process of global warming. Historically, Uzbekistan's economy has been dependent on the export of oil, gas, and cotton, which could negatively impact economic stability. For this reason, since 2017, diversifying the economy and using renewable energy sources have become among the country's top priorities.

According to President Shavkat Mirziyoyev's "New Uzbekistan Strategy," transitioning to a green economy, using renewable energy sources, recycling waste, and ensuring the efficient use of natural resources have been defined as strategic goals for the country. In his Address to the Oliy Majlis of the Republic of Uzbekistan on December 29, 2021, the President stated the following: "*Along with achieving economic progress, we must ensure sustainable development by introducing the principles of ecological safety and a green economy. In this regard,*

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we need to implement concrete measures to use renewable energy sources, develop waste recycling systems, and protect the environment."[4].

International financial institutions are also supporting the process of implementing green economy principles in Uzbekistan. In its 2022 report, the Asian Development Bank (ADB) identified the following priority areas for ensuring the sustainable development of Uzbekistan's economy: the use of renewable energy sources, the development of a waste management system, and the rational use of water resources [3]. The World Bank, meanwhile, emphasizes that an economic development model based on green economy principles will help create new jobs, increase export volumes, and ensure energy security in Uzbekistan [1].

Along with economic development, addressing environmental issues remains a pressing matter. As a result of the growth in industrial production in Uzbekistan, the volume of waste has been increasing. While the total volume of industrial production increased by 9.5% in 2021, this process led to a greater release of harmful emissions into the environment [2]. Therefore, developing an efficient waste recycling system and creating effective programs to reduce waste are of great importance.

The use of renewable energy sources is also essential for the country's economic stability. Several projects aimed at utilizing solar and wind energy are being implemented in Uzbekistan. The "Nur Navoi" solar power plant, funded by the Asian Development Bank in 2022, has an annual production capacity of 500 million kWh of electricity and contributes to enhancing the country's energy security [3].

Achieving economic stability and implementing green economy principles are of strategic importance for Uzbekistan. A green economy not only ensures economic development but also contributes to environmental protection. The transition to a green economy provides opportunities for Uzbekistan to create new jobs, increase export volumes, and ensure energy security. At the same time, this process will promote ecological stability and the efficient use of natural resources. Research findings will provide a scientific foundation for diversifying Uzbekistan's economic development model, implementing green economy principles, and ensuring economic stability. This process will enhance the country's competitiveness in international economic relations and strengthen economic security.

2. Literature Review

Since 2017, Uzbekistan has implemented large-scale reforms in its economy. The "Action Strategy" adopted under the leadership of President Shavkat Mirziyoyev has played a key role in the country's economic development. This strategy was aimed at liberalizing the economy, improving the investment climate, and supporting entrepreneurship [5].

The World Bank's diagnosis, based on the "Green, Resilient, and Inclusive Development" (GRID) approach, analyzes Uzbekistan's economic growth and reforms. The report highlights the growth of the country's gross domestic product (GDP), the improvement in the inflation rate, and the enhancement of the investment climate [5]. At the same time, the report also emphasizes the necessity of transitioning to a green economy.

Over the past five years, Uzbekistan's economy has grown 1.6 times, exceeding $90 billion. By the end of 2024, GDP surpassed $100 billion [5]. In 2024, Uzbekistan's economy demonstrated stable growth rates, confirming the country's dynamic development and ability to adapt to changing conditions. According to preliminary data, the gross domestic product (GDP) at current prices amounted to 1,454,573.9 billion UZS, representing a real increase of 6.5% compared to 2023 [5].

The term "green economy" refers to aligning economic growth with environmental sustainability. The United Nations Environment Programme (UNEP) defines a green economy as "an economy that improves human well-being and social equity while significantly reducing environmental risks and ecological scarcities." Several studies have been conducted on the implementation of green economy principles in Uzbekistan. For example, the article titled "The Importance and Specific Features of Transition to a Green Economy" analyzes the formation of the green economy concept, its development stages, the necessity of transition, its factors, principles, and indicators [6].

Key aspects of the green economy include:

- Efficient use of resources – Efficient utilization of natural resources, eliminating wastefulness, and developing a recycling system.
- Use of renewable energy sources – Reducing environmental burden by developing sources such as solar, wind, hydro, and biomass energy.
- Environmental innovations – Developing environmentally friendly technologies and applying them in production.

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The government of Uzbekistan has adopted strategic documents on transitioning to a green economy. Resolution No. PQ-4477, adopted on October 4, 2019, outlines measures for developing a green economy in Uzbekistan during the period of 2019–2030 [7]. This document sets out measures for improving energy efficiency in the economy, the rational use of natural resources, and the implementation of innovative technologies.

The article titled "Priority Directions of the Strategy for Developing a Green Economy in Our Country" presents considerations regarding the content of the priority directions, sectors, and tasks of the strategy for transitioning to a green economy. The priority directions outlined include energy efficiency, the development of renewable energy sources, adaptation to the consequences of climate change, enhancing water use efficiency, and the financial and non-financial mechanisms to support the green economy [7].

Studying foreign experiences and adapting them to Uzbekistan's conditions hold significant importance in the transition to a green economy. For instance, the experiences of countries such as South Korea and Germany in transitioning to a green economy could prove beneficial for Uzbekistan [8][9]. These countries have achieved success in improving energy efficiency, developing renewable energy sources, and introducing environmentally friendly technologies. Studying and adapting these experiences could accelerate Uzbekistan's transition to a green economy. At the same time, it is essential to develop national strategies that take into account the country's specific conditions.

From 2017 to 2024, Uzbekistan has made notable progress in promoting sustainable economic development and integrating green economy principles into its national system. A significant milestone in this process was the adoption of the "Strategy for Transitioning to a Green Economy" for 2019–2030. This forward-looking policy is aimed at enhancing energy efficiency and optimizing resource management [10]. The strategy sets specific goals, including reducing carbon emissions, expanding the use of renewable energy sources, and elevating environmental standards across various sectors [11]. Within the framework of these efforts, Uzbekistan aims to generate 25 percent of its electricity from renewable sources by 2030. This target reflects the country's aspiration to transition to a more sustainable energy system [12]. To achieve this goal, the government is prioritizing the development of solar and wind power plants. These projects are expected to significantly reduce the country's dependence on fossil fuels [13].

Beyond the energy sector, Uzbekistan has incorporated strict measures into its national policy to protect water resources and reduce waste. This is intended to establish a comprehensive environmental management system [14]. To encourage private sector participation in renewable energy projects, the government has introduced market-based pricing mechanisms and gradually phased out subsidies, creating a more favorable environment for investors [15]. The strategy also emphasizes the importance of improving the system for collecting and analyzing environmental data. This objective is pursued through the Environmental-Economic Accounting System (SEEA), which integrates environmental and economic indicators [16]. This system provides policymakers with the ability to monitor progress and make informed decisions.

Green innovations and digitalization are emerging as critical factors in this transition process. They contribute to enhancing economic efficiency, protecting the environment, and improving social well-being [17]. Through investments in renewable energy infrastructure, initiatives to promote efficient resource use, and the development of environmentally friendly practices, achievements in the healthcare sector and increased resilience to environmental challenges are anticipated..

3. Research Methodolgy

The research employs a mixed-methods design that integrates quantitative and qualitative approaches, enabling a comprehensive reflection of the multifaceted nature of Uzbekistan's economic and ecological transformations. This design was selected due to the complexity of the subject, which examines measurable economic outcomes—such as gross domestic product (GDP) growth, export volume, and renewable energy production—alongside interpretable elements like political intent and societal impact. The quantitative component focuses on statistical data to assess economic efficiency and environmental indicators, while the qualitative component analyzes policy documents, strategic frameworks, and expert opinions to contextualize these figures within a broader socio-political framework. This dual approach facilitates an in-depth analysis of the specific outcomes and underlying factors in Uzbekistan's transition to a green economy.

The study designates Uzbekistan as the primary unit of analysis and is structured as a longitudinal case study. The period from 2017 to 2024 was chosen because it aligns with significant economic reforms initiated under President Shavkat Mirziyoyev's leadership, notably the "Strategy of Actions" [5] and the subsequent "New Uzbekistan Strategy" [4]. This timeframe also corresponds with the adoption of the 2019–2030 Strategy for Transitioning to a Green Economy, signaling a commitment to sustainable development principles [7]. Focusing on this specific time range allows for tracking the evolution of policies and their outcomes, aiding in the evaluation of continuity, adaptability, and effectiveness.

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Data collection is conducted through a combination of primary and secondary sources, ensuring a robust evidence base. Primary data are sourced from official government publications, including presidential decrees, strategic documents such as the "New Uzbekistan Strategy" [4], and speeches like President Mirziyoyev's 2021 address to the Oliy Majlis [4]. These sources provide direct insights into policy objectives and priorities. Additionally, statistical data from the State Statistics Committee of the Republic of Uzbekistan are utilized to determine economic indicators, such as the GDP volume reaching 1,454,573.9 billion soums in 2024, with a real growth rate of 6.5% compared to 2023 [5].

Secondary data are gathered from reputable international organizations, including the World Bank [1], the Asian Development Bank (ADB) [3], the International Monetary Fund (IMF) [2], and the United Nations Environment Programme (UNEP) [6]. These institutions offer external perspectives and comparative analyses, such as the World Bank's 2022 Uzbekistan Economic Update [1] and the ADB's 2022 report on green economy development in Uzbekistan [3]. Scholarly literature, including articles by Rixsievna (2024) [11] and Isakulova et al. (2024) [12], is reviewed to incorporate academic insights into the transition to a green economy.

Sector-specific data, such as the "Nur Navoi" solar power plant's annual capacity of 500 million kWh [3], are triangulated through government reports, ADB financing documents, and scientific studies, enhancing reliability. This multi-source approach minimizes potential biases inherent in data from a single origin and provides a balanced representation of Uzbekistan's achievements and challenges. The analysis applies descriptive statistics, trend analysis, and thematic content analysis to process the collected data. Descriptive statistics summarize key economic indicators, such as GDP growth rates of 1.6% in 2020, 7.4% in 2021 [1], and 6.5% in 2024 [5], as well as a 9.5% increase in industrial production in 2021 [2]. These figures establish the baseline for economic efficiency. Trend analysis identifies patterns, such as the shift from reliance on raw material exports (oil, gas, and cotton) to investments in renewable energy [3], along with changes in environmental indicators, such as industrial waste emissions.

Thematic content analysis is applied to qualitative data derived from policy documents and strategic frameworks. This technique involves coding the text into key themes such as "economic diversification," "renewable energy adoption," "waste management," and "environmental security." For instance, President Mirziyoyev's statement on the necessity of integrating environmental security with economic progress [4] is coded under "sustainable development principles," while the ADB's emphasis on water resource management [3] falls into the "resource efficiency" category. These themes are compared with quantitative outcomes to assess policy effectiveness. For example, the increase in renewable energy capacity is linked to the strategic goal of reducing dependence on fossil fuels, as outlined in the 2019–2030 Strategy for Transitioning to a Green Economy [7]. Year GDP Growth (%) Export Volume (billion USD) Foreign Investments (million USD) Source

4. Analysis and Result

Uzbekistan's economy experienced significant growth between 2017 and 2024 within the frameworks of the "Strategy of Actions" [5] and the 2023 "New Uzbekistan Strategy" [4]. The following table presents indicators of GDP growth, export volume, and investments by year:

Table 1: iIndicators of GDP growth, export volume, and investments by year

Year	GDP Growth (%)	Export Volume (billion USD)	Foreign Investments (mln USD)
2017	5,1	12,5	180
2020	1,6	13,1	700
2021	7,4	14,6	2 300
2023	6,0	19,3	4 500

20 In 2020, growth dropped to 1.6% due to the pandemic's impact, but it rose to 7.4% in 2021 as a result of restored domestic demand and increased exports (14.6 billion USD) [1]. In 2024, GDP reached 1,454,573.9 billion soums at current prices, with real growth of 6.5% compared to 2023 [5]. Export volume reached 19.3 billion USD in 2023, indicating a trend of shifting from raw material exports to finished products. Foreign investments grew from 180 million USD in 2017 to approximately 5.2 billion USD in 2024, confirming the success of economic diversification and integration into the global market.

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Trend analysis reveals that the economy's dependence on oil, gas, and cotton exports decreased, while the industrial and renewable energy sectors developed [3]. This contributed to job creation and ensured economic stability [1].

The adoption of green economy principles was significantly driven by the use of renewable energy sources. The following table lists key projects and their capacities:

Table 2: Key projects and their capacities of green economy principles

Project Name	**Year Launched**	**Annual Capacity (million kWh)**	**Financier**
Nur Navoi Solar Station	2022	500	ADB [3]
Zarafshon Wind Station	2023	1 500	Saudi Company

The "Nur Navoi" station was launched in 2022, producing 500 million kWh of energy annually [3], contributing to reducing the country's dependence on fossil fuels. In 2023, the Zarafshon wind station began operations with a capacity of 1,500 million kWh, reflecting the growth of international investments. The goal of generating 25% of electricity from renewable sources by 2030 was set [12], and significant progress has been made in this direction. Trend analysis confirmed an increase in the share of solar and wind energy within the energy structure [13].

Industrial production growth (9.5% in 2021 [2]) led to an increase in waste volume, posing a threat to environmental security. The following table illustrates waste dynamics:

Table 3: Illustratation of waste dynamics

Year	**Industrial Waste (thousand tons)**	**Recycled Waste (%)**
2017	95,4	12
2021	104,8	18

In 2021, waste reached 104.8 thousand tons, with the recycling share amounting to 18% [2]. By 2023, this indicator rose to 25%, though it remains insufficient. The ADB identified waste management system development as a priority [3]. Analyses indicate that environmental damage persists due to the weakness of waste recycling infrastructure.

The issue of water resources was critical for economic stability and ecological balance. The following table presents water consumption data:

Table 4: Presentation of water consumption data

Year	**Water Consumption (billion m^3)**	**Share in Agriculture (%)**
2017	56,8	90
2021	58,2	88

Water consumption remained stable between 2017 and 2023, but the high share in agriculture (85%) highlighted the need to improve efficiency [3]. Measures for water resource management were adopted in response to climate change impacts [14], yet broader reforms are required.

Analysis of strategic documents shows that the "New Uzbekistan Strategy" [4] and the Strategy for Transitioning to a Green Economy [7] aim to harmonize economic development with ecological sustainability. President Mirziyoyev's 2021 address emphasized the necessity of environmental security and a green economy [4]. International experiences, such as those of South Korea [8] and Germany [9], were considered as models for energy efficiency.

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The analyses demonstrate that Uzbekistan has achieved success in economic growth, renewable energy, and diversification. However, waste management and water resource issues remain weak points. The transition to a green economy has enhanced the country's international competitiveness, but future progress will require increased technological innovations and investments.

5. Conclusion and Recommendations

The study of Uzbekistan's sustainable economic development and the process of implementing green economy principles from 2017 to 2024 reveals that the country achieved significant economic progress: GDP exceeded 100 billion USD in 2024 [5], export volume reached 22.1 billion USD, and renewable energy capacity grew considerably [3]. The "New Uzbekistan Strategy" [4] and the 2019–2030 Strategy for Transitioning to a Green Economy [7] played a pivotal role in ensuring economic diversification and ecological sustainability. However, challenges such as waste management (110.2 thousand tons in 2023, with a recycling share of 25%) and inefficient water resource use (85% share in agriculture) remain pertinent [2][3].

To address these issues and further develop the green economy in the future, the following recommendations are deemed relevant: First, investments in renewable energy projects (solar and wind stations) should be increased to at least 10 billion USD by 2030, strengthening energy security [12]. Second, to raise the waste recycling share to 50%, modern technologies should be introduced, and public-private partnerships expanded [3]. Third, to enhance water use efficiency, smart irrigation systems should be implemented, and a national strategy developed based on Germany's experience [9]. Fourth, fully implementing the Environmental-Economic Accounting System (SEEA) [16] and enhancing the monitoring of ecological and economic indicators are essential.

These recommendations aim to ensure economic stability, protect the environment, and enhance Uzbekistan's competitiveness in international economic relations. The transition to a green economy remains of strategic importance for the country's sustainable development in the context of climate change.

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