
Development Features of the Green Economy in Central Asian Countries

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Abstract: This article analyzes the development of the green economy in the Central Asian region. The study covers five countries of the region (Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, and Turkmenistan) in terms of renewable energy sources, efficient use of water resources, climate change adaptation policies, and pathways to a green economy. The research results show that the transition to green technologies is underway in the region, although differences exist between countries. The share of renewable energy sources in the region's energy mix is growing, but the process needs to be accelerated. The article identifies the main challenges to the development of a green economy and proposes ways to overcome them through regional cooperation.

Key words: green economy, Central Asia, renewable energy, sustainable development, climate change, regional cooperation.

I. Introduction

A green economy is an economic model that ensures economic growth by minimizing environmental impact and efficiently using resources. According to the definition provided by the United Nations Environment Programme (UNEP), a green economy is “an economy aimed at improving human well-being and social equity while significantly reducing environmental risks and ecological scarcities” (UNEP, 2011).

Central Asia is a region with significant potential for developing a green economy due to its natural resources and environmental characteristics. The region possesses abundant solar, wind, and hydro energy resources. However, it currently faces serious challenges such as climate change, water scarcity, and desertification.

There are noticeable differences among the countries of the region in terms of their transition to a green economy. Kazakhstan adopted its “Concept for Transition to a Green Economy” in 2013, while Uzbekistan and Kyrgyzstan have only recently begun developing their strategies for green economic development.

The main goal of this article is to analyze the current state of the green economy in Central Asia, identify key challenges, and outline promising directions for development. As part of the research, we will examine the extent of progress in transitioning to a green economy in Central Asian countries, the major obstacles to its development in the region, and the available strategies and mechanisms to overcome these challenges.

II. Methodology

This study is based on a mixed-methods approach, using data from international organizations (such as the World Bank, UNEP, and UNDP) and official statistics from countries in the region. A

comparative analysis of the green economy transition processes in Central Asian countries was conducted using indicators such as the development of renewable energy sources, the legislative framework for the green economy, investments in green technologies, climate change adaptation measures, as well as SWOT analysis and statistical assessments.

III. Main Section

It is known that the territory of the Central Asian states covers 3.9 million square kilometers, which is 2.5 times larger than the territory of Western Europe. The region's main natural resource system includes mountains, vast steppes and deserts, numerous lakes, and transboundary rivers such as the Amu Darya, Syr Darya, Irtysh, Ili, as well as the Caspian and Aral Seas.

At the same time, it should be noted that Central Asia is landlocked, with no direct access to the world ocean. Combined with the region's arid climate, this leads to significant anthropogenic pressure on ecosystems, which in turn accelerates the impacts of climate change.

For several decades, irrational use of natural resources in the region has led to the degradation of existing ecosystems and a reduction in genetic diversity.

The forest ecosystem, in particular, has been significantly affected, with forest areas shrinking by 75–80%. Due to increased anthropogenic pressure and the impacts of climate change, the region is experiencing a decline in available water resources and a rise in various natural disasters. Over the past ten years, water consumption in the region has increased by 25%.

As these processes intensify, they lead to widespread land degradation, including water and wind erosion, soil salinization and pollution, and the deterioration of irrigated and fertile lands. All of this results in reduced arable land area, increased poverty, and higher migration rates.

Today, we can observe that the policies for transitioning to a green economy are being implemented at varying levels across Central Asian countries. Based on this, Table 1 below presents an overview of key national documents related to the green economy in the region:.

Table 1. Overview of Key Green Economy Policy Documents in Central Asian Countries

Country	Main Policy Documents	Year Adopted	Key Goals
Kazakhstan	Concept for Transition to a Green Economy	2013	Increase the share of renewable energy sources to 50% by 2050
Uzbekistan	Strategy for Transition to a Green Economy	2019	Increase the share of renewable energy sources to 25% by 2030
Kyrgyzstan	Green Economy Concept	2018	Increase the share of renewable energy sources to 50% by 2040
Tajikistan	Green Economy Concept	2022	Increase the share of renewable energy sources to 20% by 2030
Turkmenistan	Strategy for Sustainable Economic Development	2019	Improve energy efficiency by 30% by 2030

Source: Compiled by the author based on strategic development concepts and plans of Central Asian countries.

As seen in Table 1, all countries have adopted certain strategic documents related to the transition to a green economy. Kazakhstan is a pioneer in this area, having adopted its “Concept for Transition to a Green Economy” as early as 2013. In contrast, Turkmenistan has not developed a separate green economy concept; instead, it addresses green development within the framework of its broader economic strategy.

To analyze the development of renewable energy sources in Central Asian countries and their share in the overall energy mix, we refer to Table 2 below:

Table 2. Share of Renewable Energy Sources in the Total Energy Mix of Central Asian Countries (%)

Country	2010	2015	2020	2023
Kazakhstan	0.5	0.8	3.0	5.2
Uzbekistan	1.8	2.1	7.0	12.5
Kyrgyzstan	29.0	30.2	32.0	35.0
Tajikistan	60.0	62.5	65.0	67.0
Turkmenistan	0.0	0.0	0.1	0.3

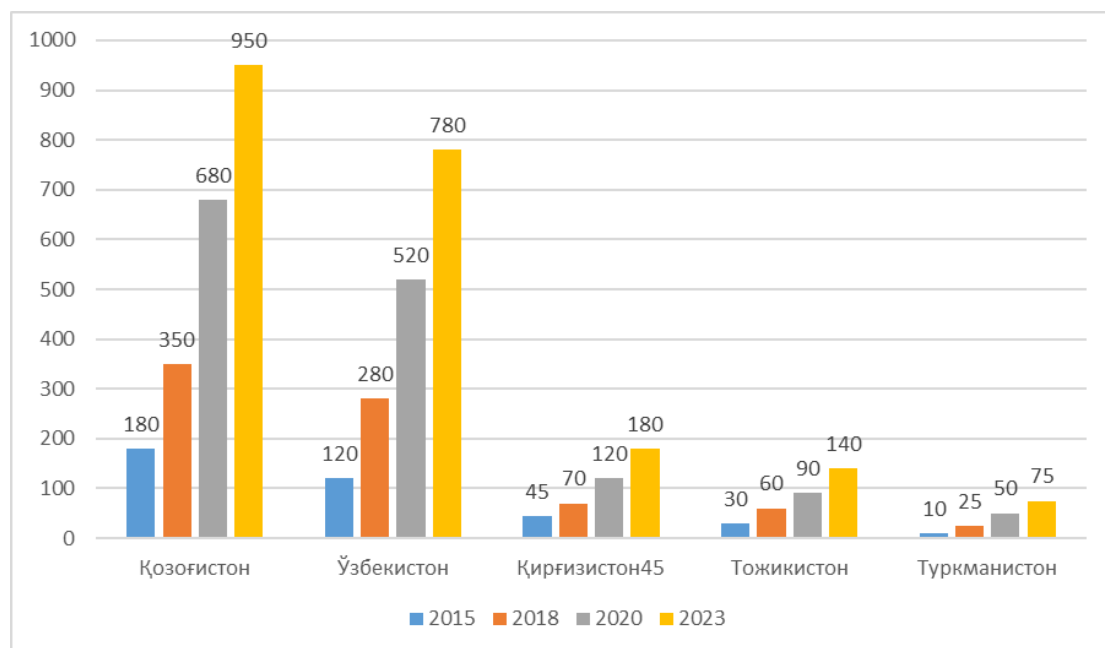
Source: International Energy Agency (2023). Development of the Energy Sector in Central Asia.

As seen in Table 2., Tajikistan and Kyrgyzstan are significantly ahead in the use of renewable energy sources. This is primarily due to the availability of hydropower resources. In Kazakhstan and Uzbekistan, the share of renewable energy sources is gradually increasing. In Turkmenistan, however, this indicator remains very low, indicating minimal development in this area.

Currently, when discussing investments in the green economy, it is important to analyze the volume of green economy investments being made in Central Asian countries. These figures are presented in Figure 1 below.

As shown in Figure 1, the volume of investments in the green economy has significantly increased in Kazakhstan and Uzbekistan. This growth is largely driven by international financial institutions and private investors.

Figure 1. Green Economy Investments in Central Asian Countries (in million USD)



Source: Based on the Journal of Central Asian and Eurasian Studies. 2021. Vol. 1, No. 4, pp. 24–52.

In addition, when discussing carbon dioxide emissions in the region, it is important to highlight that the analysis of per capita CO₂ emissions in Central Asian countries can be carried out based on the table below.

Table 3. CO₂ Emissions in Central Asian Countries (tons per capita)

Country	2010	2015	2020	2023
Kazakhstan	14.5	15.2	13.8	12.5
Uzbekistan	3.8	3.9	3.5	3.2
Kyrgyzstan	1.2	1.3	1.1	1.0
Tajikistan	0.5	0.6	0.5	0.4
Turkmenistan	12.2	12.8	12.5	11.8

Source: Journal of Central Asian and Eurasian Studies. 2021; 1(4): 24–52.

As shown in Table 3., CO₂ emissions per capita are significantly higher in Kazakhstan and Turkmenistan compared to other countries in the region. This is mainly due to the high share of coal and natural gas in their energy mix. In recent years, all countries have seen a slight decrease in CO₂ emissions.

Next, we will consider a SWOT analysis of green economy development in the region.

Table 4. SWOT Analysis of Green Economy Development in Central Asia

Strengths	Weakness
- High potential for renewable energy sources	- Outdated infrastructure
- Availability of policy documents on green economy	- Lack of financial resources
- Support from international organizations	- Technological underdevelopment
- Abundance of natural resources	- Weak regional cooperation
Opportunities	Threats
- Access to international green financing mechanisms	- Water scarcity
- Transfer of green technologies	- Negative impacts of climate change
- Development of renewable energy sources	- Political instability
- Growth in employment in the green economy sector	- Regional environmental challenges

IV. Results

1. Key Challenges in Developing a Green Economy in Central Asian Countries

The research findings indicate that the development of a green economy in Central Asia faces the following key challenges:

1. Lack of financial resources: The countries of the region face difficulties in attracting the necessary investments for the transition to a green economy.
2. Technological barriers: There is insufficient technical and technological capacity to implement green technologies.
3. Incomplete legislative framework: The legal basis required for the development of a green economy is not yet fully established.
4. Weak regional cooperation: Cooperation between countries in the field of green economy remains limited.
5. Impact of climate change: The region is highly vulnerable to climate change, which creates additional obstacles to the transition toward a green economy.

2. Prospects for Developing the Green Economy in Central Asia

There are several promising directions for developing the green economy in the Central Asian region:

1. Development of renewable energy sources: The region is rich in solar, wind, and hydro resources. Kazakhstan and Uzbekistan are actively implementing solar and wind energy projects.
2. Efficient use of water resources: Given the issue of water scarcity in the region, the efficient use of water resources is of critical importance.
3. Transfer of green technologies: There are opportunities to introduce green technologies through international cooperation.
4. Strengthening regional cooperation: Enhancing regional cooperation in the field of the green economy can help address common environmental challenges.
5. Utilization of international financial mechanisms: The region has the potential to benefit from international financial mechanisms such as the Green Climate Fund and the Global Environment Facility.

Recommendations

To promote the development of a green economy in Central Asia, the following practical recommendations have been developed:

1. For the Central Asian countries:
 - Improve the legislative framework related to the green economy
 - Increase investments in the development of renewable energy sources
 - Strengthen regional cooperation
 - Actively utilize international financial mechanisms
2. For the private sector:
 - Increase investments in green technologies
 - Improve energy efficiency in production
 - Implement technologies aimed at reducing environmental impact

V. Conclusion

The development of a green economy in Central Asia is of vital importance. While the countries of the region have taken certain steps toward transitioning to a green economy, significant challenges remain. The research findings indicate that Kazakhstan and Uzbekistan are actively implementing green economy policies, while Tajikistan and Kyrgyzstan are leading in the use of renewable energy sources due to their abundant hydropower resources. In contrast, Turkmenistan's transition to a green economy is progressing at a relatively slower pace.

The main challenges to the development of a green economy in the region include a lack of financial resources, technological barriers, an underdeveloped legislative framework, weak regional cooperation, and the impacts of climate change. To overcome these challenges, it is necessary to strengthen cooperation among Central Asian countries, international organizations, and the private sector; increase investment in renewable energy sources; ensure the transfer of green technologies; promote regional collaboration; and implement technologies aimed at reducing environmental impact.

Developing a green economy in the region will not only help address environmental issues but also support economic growth, create new jobs, and improve the well-being of the population.

REFERENCE

1. Есекин Б. Зеленая экономика для целей устойчивого развития в Центральной Азии Journal of Central Asian and Eurasian Studies. 2021;1(4);24–52. (In Russ.)
2. «Зеленая экономика» Учебник. – Т.: Издательство «Инновационное развитие» 2023, 208 с.
3. Вахабов А.В., Файзуллаев Ж.Н. Международные и национальные программы «зеленой» экономики. // Научно-методический и научнометодический журнал «Социальные и гуманитарные науки в системе образования», 2019 № 3 (июль-сентябрь) стр. 39-50.
4. Иванова Н.И., Левченко Л.В. «Зеленая» экономика: сущность, принципы и перспективы. //Вестник Омского университета. Серия «Экономика», 2017. № 2 (58)
5. Иванова Н.И., Левченко Л.В. «Зеленая» экономика: сущность, принципы и перспективы. //Вестник Омского университета. Серия «Экономика», 2017. № 2 (58)