



Article

Improving the Management of Sustainable Development of Kashkadarya Region Based on the Transition to a Green Economy

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Abstract: the article examines the theoretical, methodological, organizational and economic aspects of sustainable development of the Kashkadarya region based on the principles of a green economy. The necessity of coordinating economic growth in industry, agriculture, energy, transport, construction and services with resource efficiency, energy intensity, water saving, renewable energy, waste recycling and green investment is substantiated. Taking into account the economic potential and environmental constraints of the region, an integrated regional management mechanism based on the relationship “economic growth – resource efficiency – environmental sustainability – social well-being” is proposed. Scientific proposals are developed for introducing a Regional Green Development Index, assessing districts and cities according to environmental and economic efficiency, forming a green investment portfolio, expanding green finance instruments and implementing environmental projects through public-private partnerships.

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1. Introduction

In the global economy, the traditional model of economic growth is increasingly facing serious constraints associated with the growing consumption of natural resources, high energy and raw-material intensity, and mounting anthropogenic pressure on the environment. Against this background, the “green” economy model, which seeks to harmonize economic growth with environmental security, the rational use of resources, and social well-being, has become one of the key priorities of contemporary economic policy. The conceptual foundations of this approach were laid by the Brundtland Commission’s definition of sustainable development [1] and by early environmental-economics research that introduced the notion of a “green” economy [2]; at the global level, these ideas were subsequently consolidated in the 2030 Agenda for Sustainable Development [3].

According to the approach of the United Nations Environment Programme (UNEP), a “green” economy is an economic system that improves human well-being and social equity while significantly reducing environmental risks and ecological scarcities [4]. This model is based on the integrated principles of low-carbon development, efficient resource use, and social inclusiveness [5].

In Uzbekistan, the transition to a “green” economy has been established as a strategic direction of national economic policy. The Strategy for the Transition of the Republic of Uzbekistan to a Green Economy for 2019–2030, approved by Resolution No. PQ-4477 of the President of the Republic of Uzbekistan dated October 4, 2019, identifies the following priority areas: improving energy efficiency in key sectors of the economy, expanding the use of renewable energy sources, increasing the efficiency of natural resource utilization, adapting to climate change, and developing financial support mechanisms for the green economy [6].

Furthermore, Resolution No. PQ-436 dated December 2, 2022, provides for a 35 percent reduction by 2030 in specific greenhouse gas emissions per unit of GDP compared with the 2010 level; an increase in renewable energy capacity to 15 GW; an increase in the share of renewable energy in electricity generation to more than 30 percent; at least a 20 percent improvement in energy efficiency in industry; a 30 percent reduction in energy consumption per unit of GDP; the introduction of water-saving technologies on up to 1 million hectares of land; and an increase in the recycling rate of municipal solid waste to more than 65 percent [7].

The implementation of these objectives at the regional level is of particular importance because regions differ significantly in terms of natural-resource potential, economic structure, industrial specialization, water and energy consumption, and environmental pressure. In this regard, for the Kashkadarya Region, which has a significant share of natural gas extraction, oil and gas chemistry, agriculture, and industrial production, the transition to a “green” economy is not only an environmental necessity but also an important factor in ensuring long-term economic competitiveness.

2. Materials and Methods

The study employed methods of systems analysis, comparative analysis, statistical grouping, induction and deduction, economic and statistical analysis, indicator-based assessment, and an integrated approach. The information base of the research consisted of legislative documents of the Republic of Uzbekistan, data from the Statistics Department of the Kashkadarya Region, as well as materials published by the World Bank, the United Nations Environment Programme (UNEP), and the Organisation for Economic Co-operation and Development (OECD).

3. Results

Limitations here are those of a small, purposively selected panel. Four organisations yield eighteen object-year cells, which is sufficient to establish that a phenomenon occurs and insufficient to estimate how often it occurs in the population. The completeness index weights its ten criteria equally, and a different weighting would shift the levels although not, we think, the ranking. The assessment of interpretability in the diagnostic power index involves judgement, which we have made explicit by reporting the component scores rather than the index alone. Register-level data were not available, so we cannot say whether a given deviation originated in the ledger or in transcription, except where the articulation tests themselves locate it.

To comprehensively assess the level of “green” development of the region, the following composite index is proposed. The index ranges from 0 to 1, with a higher value indicating a stronger balance between economic development and environmental sustainability in the region.

The OECD methodology also recommends assessing “green growth” through an integrated evaluation of the environmental and resource productivity of the economy, the

natural asset base, the environmental dimension of quality of life, as well as economic opportunities and policy responses [8], [9].

The Kashkadarya Region is one of the major regions of the country in terms of economic potential. According to the results of 2025, the region's gross regional product increased by 6.8 percent, industrial production by 7.2 percent, agriculture, forestry and fisheries by 4.3 percent, construction works by 10.8 percent, and market services by 13.6 percent. As of January 1, 2026, the population of the region was approximately 3.717 million, while 30,424 enterprises and organizations were operating in the region [10]. Economic growth continued during January–June 2026. The growth rate of gross regional product amounted to 108.4 percent, industrial production to 108.3 percent, agriculture, forestry and fisheries to 105.4 percent, construction to 119.4 percent, and services to 115.8 percent. At the same time, the index of investment in fixed capital amounted to 76.4 percent [11].

Although these figures indicate a high level of economic activity in the region, assessing sustainable development solely on the basis of growth in production volumes is insufficient. In the context of a “green” economy, the amount of energy, water, and raw materials consumed per unit of value added, the volume of waste and emissions generated, and the impact of economic growth on the quality of the population's living environment become equally important evaluation criteria.

According to World Bank assessments, Uzbekistan is among the economies characterized by relatively high energy and natural-resource intensity. Insufficient implementation of climate change adaptation measures may have adverse long-term effects on economic growth, employment, and household incomes. The World Bank's Country Climate and Development Report notes that the energy sector is the main source of greenhouse gas emissions in Uzbekistan and identifies improvements in energy efficiency and the expansion of renewable energy as key prerequisites for decarbonization [12]. These priorities are consistent with the Republic of Uzbekistan's updated nationally determined contribution under the Paris Agreement, which envisages a reduction in the greenhouse gas intensity of gross domestic product by 2030 [13]. Under the conditions of the Kashkadarya Region, the following priority areas of “green” transformation can be identified.

First, there is a need for the “green” modernization of industry. The presence of large industrial and fuel-and-energy enterprises in the region creates opportunities to reduce energy intensity, digitalize production processes, utilize secondary energy resources, and introduce waste-free and low-waste technologies. The economic efficiency of enterprises should be assessed not only by production volume or profit, but also by energy consumption, water use, and emissions per unit of output. International assessments identify industrial energy efficiency as one of the most cost-effective instruments for simultaneously lowering production costs and reducing emissions [14].

Second, it is advisable to expand the regional model of solar energy utilization. This process should not be limited to the construction of large-scale power plants; it is also important to promote distributed solar energy systems at industrial enterprises, farms, social infrastructure facilities, service establishments, and households. As a result, electricity transmission and distribution losses may be reduced, business operating costs may decline, and new “green” jobs may be created. International cost assessments confirm the continued decline in the levelised cost of solar photovoltaic generation, which strengthens the economic rationale for such projects [15].

Third, improving water-use efficiency in agriculture is a strategic priority for the Kashkadarya Region. Given the scarcity of water resources and the intensifying effects of climate change, it is necessary to expand the use of drip and sprinkler irrigation systems, introduce digital monitoring of water consumption, optimize the structure of crops in favor of less water-intensive varieties, and manage the relationship between “water

consumption – crop yield – income”. These directions correspond to the tasks set out in the national action plan on climate change and natural-disaster risk [16].

For this purpose, the following indicator can be used:

$$SS = QQQ / WS$$

where:

SS – water-use efficiency;

QQQ – value added generated in agriculture;

WS – volume of water used.

An increase in this indicator reflects an increase in the economic value generated per cubic metre of water used.

Fourth, it is necessary to develop the circular economy. Under current conditions, waste should be regarded not merely as an object of collection and disposal, but as a secondary economic resource. The formation of regional value chains for the production of compost and biogas from organic waste, secondary materials from construction waste, and recycled products from plastic, glass, and metal waste can create new areas of entrepreneurial activity. UNEP associates the principles of the circular economy with reducing waste and pollution, keeping products and materials in economic circulation for as long as possible, and restoring natural capital [17]. The economic rationale for such a transition, including reduced material costs and the emergence of new revenue streams, has likewise been substantiated in international studies [18].

Fifth, it is necessary to integrate “green” transport and urbanization policies into regional development programmes. In the city of Karshi and major district centres, improving the energy efficiency of public transport, developing electric vehicle infrastructure, expanding pedestrian and cycling routes, and strengthening energy-efficiency standards for buildings can help reduce environmental pressure. Resolution No. PQ-436 identifies sustainable and inclusive “green” urbanization, as well as ensuring the sustainability of buildings and structures, transport, and waste management, as a separate priority area [7].

Based on the results of the study, it is proposed to transform the management of the “green” transformation of the Kashkadarya Region from the existing sectoral approach into an integrated regional governance system based on performance and measurable outcomes.

The proposed mechanism consists of the following interrelated blocks:

Strategic objective, regional diagnostics, green investments, economic incentives, sectoral transformation, monitoring and indexing, economic and environmental outcomes.

In the first block, the natural-resource potential, industrial specialization, water and energy consumption, environmental pressure, and “green” business opportunities of each district and city are diagnosed. In the second block, a specific “green specialization” is determined for each district. For example, renewable energy may be prioritized in areas with high solar-energy potential; water-saving and agroecological technologies in areas of intensive agriculture; energy efficiency and the circular economy in industrial areas; and ecotourism and environmental services in tourism-oriented areas. In the third block, a Regional Green Investment Portfolio is formed. Each project included in this portfolio should be evaluated not only in terms of conventional financial efficiency, but also according to three additional criteria:

economic effect + environmental effect + social effect.

The overall efficiency of a project can be determined as follows:

$$KYS = \alpha IE + \beta EE + \gamma IS$$

where:

KYS – composite green efficiency;

IE – economic efficiency;

EE – environmental efficiency;

IS – social efficiency;

α, β, γ – weighting coefficients determined on the basis of expert assessment.

This approach prevents highly profitable but environmentally harmful projects from gaining priority in regional development programmes. In evaluating the performance of regional, district, and city administrations, it is advisable to introduce the following indicators, which are methodologically consistent with the green growth indicators used in international practice [19]:

Table 1. Key Regional Indicators for Evaluating the Performance of Regional, District, and City Administrations

No	Area	Key Regional Indicator
1	Economic growth	Real GRP growth rate
2	Energy efficiency	Energy consumption per unit of GRP
3	Renewable energy	Share in total energy consumption
4	Water-use efficiency	Value added generated per 1 m ³ of water
5	Green investment	Share in total investment
6	Circular economy	Share of recycled waste
7	Green entrepreneurship	Number of enterprises engaged in green activities
8	Green employment	Share of green jobs
9	Environmental conditions	Dynamics of atmospheric emissions
10	Green space development	Share of green areas

The advantage of this KPI system is that the performance of regional leaders is assessed not only by the amount of investment attracted or the extent to which production volumes have increased, but also by the resource and environmental cost of economic growth. For example, if GRP increases by 8 percent while energy and water consumption rise by 10 percent, such economic growth cannot be fully classified as “green growth.” By contrast, a decline in the amount of energy, water, and other natural resources consumed per unit of output alongside an increase in production volume represents a genuine result of “green” transformation.

To accelerate the development of the green economy in the Kashkadarya Region, the following sources of financing should be integrated into a unified system:

funds from the state budget and regional development programmes; green credit lines provided by commercial banks; concessional resources from international financial institutions; public-private partnership projects; green bonds; investments by energy service companies; and private and foreign investment.

International experience shows that many green technologies require substantial initial capital expenditures and, therefore, create strong demand for long-term and relatively low-cost financial resources [20]. For this reason, applying the same lending conditions to “green” projects as to conventional commercial projects may reduce their economic attractiveness. Internationally recognised standards for the issuance of green bonds provide a framework for directing such resources to eligible environmental projects [21].

At the regional level, it is proposed to establish a “Kashkadarya Green Projects Registry.” The registry should include projects related to energy efficiency, solar and wind energy, water conservation, waste recycling, environmentally friendly transport, energy-efficient buildings, and ecotourism. Projects included in the registry may be presented to international financial institutions and private investors as a ready-made investment portfolio.

The limited financial capacity of the state in the transition to a “green” economy makes it necessary to attract private capital. In this regard, the public-private partnership mechanism can be particularly effective in the following areas:

- renewable energy;
- waste recycling;
- wastewater treatment;
- energy-efficient public buildings;
- electric transport infrastructure;
- ecotourism;
- urban green infrastructure.

The role of the state should be to create institutional stability and economic incentives for investors, while the role of the private sector should be to provide capital, technology, and modern management expertise.

The results of the study indicate that the transition to a “green” economy in the Kashkadarya Region should not be regarded as a narrowly defined task of environmental policy. Rather, this process requires the coordination of industrial policy, investment policy, agriculture, energy, transport, employment, and regional governance around a common strategic objective. From this perspective, the “green” economy should be viewed not as an economic model that constrains the pace of regional growth, but as one that transforms the quality of that growth. Greater resource efficiency reduces production costs, renewable energy strengthens energy security, waste recycling creates new value chains, environmentally sustainable production enhances export competitiveness, and green infrastructure contributes positively to the quality of life of the population.

The UNEP approach likewise interprets the transition to a green economy not as a rejection of economic growth, but as a qualitative transformation of the economy through the redirection of investment flows toward clean technologies, resource efficiency, new employment opportunities, and environmentally sustainable infrastructure [22].

4. Conclusion

Based on the conducted research, the following scientific conclusions were formulated. To ensure the sustainable economic development of the Kashkadarya Region, it is necessary to shift from a management model based on the conventional expansion of production volumes toward a “green” governance model that integrates resource efficiency, environmental sustainability, and social outcomes. The management of the transition to a “green” economy in the region should be based on the interrelationship between economic growth – resource efficiency – environmental sustainability – social well-being.

In this regard, the following measures are proposed:

first, to develop and annually publish a Green Regional Development Index for the Kashkadarya Region, its districts, and cities;

second, to develop a green development profile for each district and city in accordance with its natural-resource potential and economic specialization;

third, to introduce a comprehensive project evaluation system at the regional level that simultaneously takes into account economic, environmental, and social efficiency when selecting investment projects;

fourth, to gradually introduce resource-efficiency audits at industrial enterprises aimed at reducing energy, water, and raw-material consumption per unit of output;

fifth, to assess water-use efficiency in agriculture using the indicator of value added generated per 1 m³ of water;

sixth, to develop regional circular-economy clusters that return waste to economic circulation as secondary raw materials;

seventh, to establish a Kashkadarya Green Investment Project Portfolio and an electronic registry and, on this basis, attract international financial institutions and private investors;

eighth, to make wider use of financial instruments such as green credit, public-private partnerships, green bonds, and energy service contracts;

ninth, to incorporate KPIs such as energy efficiency, water conservation, green investment, the share of recycled waste, green areas, and green jobs into the performance evaluation system for district and city leaders.

The proposed mechanism will contribute to gradually reducing the dependence between economic growth and natural-resource consumption in the Kashkadarya Region, lowering the energy and resource intensity of production, stimulating private green investment, creating new jobs, and ensuring the region's long-term socio-economic and environmental sustainability.

REFERENCES

- [1] World Commission on Environment and Development, *Our Common Future*. Oxford, U.K.: Oxford Univ. Press, 1987.
- [2] D. W. Pearce, A. Markandya, and E. B. Barbier, *Blueprint for a Green Economy*. London, U.K.: Earthscan, 1989.
- [3] United Nations General Assembly, "Transforming our world: The 2030 agenda for sustainable development," Resolution A/RES/70/1, New York, NY, USA, 2015.
- [4] United Nations Environment Programme, "What is an inclusive green economy?," UNEP, Nairobi, Kenya, 2019.
- [5] United Nations Environment Programme, "Towards a green economy: Pathways to sustainable development and poverty eradication," UNEP, Nairobi, Kenya, 2011.
- [6] President of the Republic of Uzbekistan, "On approval of the strategy for the transition of the Republic of Uzbekistan to a 'green' economy for the period 2019–2030," Resolution No. PQ-4477, Tashkent, Uzbekistan, Oct. 4, 2019.
- [7] President of the Republic of Uzbekistan, "On measures to increase the effectiveness of reforms aimed at the transition of the Republic of Uzbekistan to a 'green' economy by 2030," Resolution No. PQ-436, Tashkent, Uzbekistan, Dec. 2, 2022.
- [8] Organisation for Economic Co-operation and Development, *Towards Green Growth: Monitoring Progress — OECD Indicators*. Paris, France: OECD Publishing, 2011.
- [9] Organisation for Economic Co-operation and Development, *Green Growth Indicators 2017*. Paris, France: OECD Publishing, 2017.
- [10] Statistics Department of the Kashkadarya Region, National Statistics Committee of the Republic of Uzbekistan, "Socio-economic situation of the Kashkadarya region in 2025," Karshi, Uzbekistan, 2026.
- [11] Statistics Department of the Kashkadarya Region, "Kashkadarya region in figures: January–June 2026," Karshi, Uzbekistan, 2026.

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- [12] World Bank Group, "Uzbekistan country climate and development report," World Bank, Washington, DC, USA, Nov. 2023.
 - [13] Republic of Uzbekistan, "Updated nationally determined contribution under the Paris Agreement," UNFCCC, Bonn, Germany, 2021.
 - [14] International Energy Agency, "Energy efficiency 2024," IEA, Paris, France, 2024.
 - [15] International Renewable Energy Agency, "Renewable power generation costs in 2023," IRENA, Abu Dhabi, UAE, 2024.
 - [16] Cabinet of Ministers of the Republic of Uzbekistan, "On the development and organisation of the effective implementation of the national action plan on climate change and natural-disaster risk," Resolution No. 362, Tashkent, Uzbekistan, Aug. 11, 2023.
 - [17] United Nations Environment Programme, "Advancing sustainable consumption and production: Circularity in the economy of tomorrow," UNEP, Nairobi, Kenya, 2020.
 - [18] Ellen MacArthur Foundation, "Towards the circular economy: Economic and business rationale for an accelerated transition," Cowes, U.K., 2013.
 - [19] Organisation for Economic Co-operation and Development, "Green growth indicators (database)," OECD, Paris, France, 2025–2026.
 - [20] United Nations Environment Programme, "Green economy and sustainable finance: Resource efficiency and green investment approaches," UNEP, Nairobi, Kenya.
 - [21] International Capital Market Association, "Green bond principles: Voluntary process guidelines for issuing green bonds," ICMA, Paris, France, 2021.
 - [22] United Nations Environment Programme, "Uncovering pathways towards an inclusive green economy: A summary for leaders," UNEP, Nairobi, Kenya, 2015.