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PROSPECTS FOR THE DEVELOPMENT OF AGRICULTURAL ECONOMY IN ENSURING THE STABILITY OF THE GREEN ECONOMY IN UZBEKISTAN

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Abstract

The green economy is an increasingly vital framework for achieving sustainable development, especially in resource-dependent countries like Uzbekistan. Agriculture, as a central pillar of the Uzbek economy, plays a crucial role in promoting environmentally sustainable practices. This paper analyzes the intersection of agriculture and green growth, assessing the prospects and challenges for developing a resilient agricultural economy that supports the stability of the green economy in Uzbekistan. The article presents policy recommendations and strategic actions aligned with global sustainability trends.

In recent years, the concept of the green economy has emerged as a strategic priority in the sustainable development agenda of many nations, including Uzbekistan. As environmental challenges intensify and resource constraints become more evident, transitioning to a green economy is no longer an option but a necessity. Agriculture, being one of the dominant sectors in Uzbekistan's economy and a major user of natural resources, holds a pivotal role in this transition. The development of a sustainable and modern agricultural economy not only ensures food security and rural livelihoods but also directly contributes to ecological balance and climate resilience.

Uzbekistan possesses vast agricultural potential, including fertile lands, diverse agro-climatic zones, and a growing emphasis on agrotechnologies. However, the country still faces significant challenges such as inefficient irrigation systems, soil degradation, and the overuse of chemical inputs, which undermine the principles of a green economy. Thus, there is an urgent need to reorient agricultural policies, technologies, and investment strategies towards environmentally responsible practices.

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This article explores the key prospects and strategic directions for developing Uzbekistan's agricultural economy in the context of stabilizing the green economy. It analyzes current initiatives, policy reforms, and international best practices, and offers practical recommendations for integrating ecological, economic, and social sustainability in the agricultural sector. By aligning agricultural development with green growth principles, Uzbekistan can ensure long-term economic resilience and environmental protection.

As nations worldwide face the dual challenge of economic development and environmental preservation, the concept of the green economy has become a global imperative. In Uzbekistan, where agriculture accounts for nearly one-third of employment and a significant portion of GDP, the greening of agriculture is essential for long-term economic and environmental resilience. Transitioning to sustainable agricultural systems can help mitigate climate change impacts, preserve biodiversity, and ensure food and water security.

Agriculture is both a contributor to and a victim of environmental degradation. Traditional practices, including excessive irrigation, chemical fertilizers, and monocropping, have led to soil salinization, water scarcity, and declining productivity. However, when properly managed, agriculture can be a driver of green economic transformation by:

- Enhancing soil fertility through organic practices
- Promoting crop diversification and agroecological methods
- Reducing greenhouse gas emissions
- Supporting rural livelihoods and equitable development

In Uzbekistan, a green transition in agriculture supports the broader goals of the national Strategy for the Transition to a Green Economy (2023–2030).

Despite its potential, Uzbekistan's agricultural economy faces several pressing challenges:

- Water scarcity: Over 90% of water usage is attributed to agriculture, much of it through outdated irrigation methods.
- Land degradation: Soil erosion, salinization, and desertification reduce productivity and threaten food security.
- Climate vulnerability: Increasing temperatures and erratic rainfall patterns impact crop yields.
- Technological gaps: Limited adoption of precision agriculture and sustainable practices due to lack of training and investment.

Addressing these issues is critical to aligning agriculture with the principles of the green economy.

Table-1

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Recommendations for developing the agricultural economy to support the green economy in uzbekistan

N	Recommendation	Explanation	Key Action Steps
1	Modernize Irrigation and r Management	Upgrade irrigation systems to reduce r waste and increase efficiency.	- Promote /sprinkler irrigation rovide farmer training er technology subsidies
2	Promote Climate-Smart Organic Agriculture	Transition to sustainable farming to ove resilience and reduce chemical use.	- Support organic fication ncourage agroecological ods in rural cooperatives
3	Integrate Renewable gy in Agriculture	Use solar, wind, and bioenergy to reduce fuel dependency and emissions.	- Install solar ps/greenhouses unch rural pilot projects entivize green energy use
4	Expand Green Finance ss	Provide financial tools to help farmers st in sustainability.	- Create a green stment fund Offer eco-loans Reward environmental rmance
5	Strengthen Agricultural ation and Capacity	Build human capital through education raining in green practices.	- Develop agroecology cula ain farmers and youth romote eco-innovation
6	Foster Digital sformation (AgTech)	Apply digital tools for smarter farming, r resource use, and access to markets.	- Develop e-agriculture orms pport AgTech startups rovide digital literacy rams
7	Improve Institutional and y Frameworks	Align policies and institutions to support n agricultural transformation.	- Coordinate national egies Enforce environmental sments ter local engagement
8	Encourage Regional and national Cooperation	Engage in knowledge exchange and nal collaboration for sustainable ulture.	- Partner with /UNDP/ICARDA n regional sustainability orms perate on water use

Uzbekistan is actively pursuing reforms and projects to modernize its agricultural sector in line with environmental objectives. Promising strategies include:

Irrigation system modernization. Transitioning from flood to drip and sprinkler irrigation systems reduces water usage by 30–50%, improving efficiency and conserving water resources. Agroecology and organic farming. Supporting organic certification and agroecological training can lead to higher-quality products and access to niche export markets. Renewable energy in agriculture. Introducing solar-powered water pumps and greenhouses reduces reliance on fossil fuels and cuts emissions. Digital agriculture (AgTech). Investing in digital platforms for weather forecasting, soil monitoring, and smart farming optimizes inputs and enhances resilience. Policy reforms and financial incentives. Subsidies for eco-friendly inputs, carbon credit systems, and green investment funds can stimulate private sector participation in sustainable agriculture.

Case study: pilot projects and regional practices. In regions like Samarkand and Khorezm, pilot programs have demonstrated that sustainable farming practices can increase yields while reducing environmental harm. For example, conservation agriculture techniques have improved soil structure and reduced erosion, while community-based water management has enhanced local participation and accountability.

Recommendations. Based on the challenges and opportunities identified in the analysis, the following comprehensive recommendations are proposed to foster the development of a sustainable agricultural economy that supports Uzbekistan's green economic agenda:

Modernize irrigation and water management systems. Explanation. Over 90% of Uzbekistan's water resources are consumed by agriculture. Modernizing outdated irrigation systems—by introducing drip, sprinkler, and moisture-saving technologies—can drastically reduce water waste and improve crop yields. Action Steps. Prioritize investment in water-efficient infrastructure, expand training programs for farmers on smart irrigation practices, introduce incentives (e.g., subsidies) for farms that adopt water-saving technology.

Promote climate-smart and organic agriculture. Explanation: Climate-smart agriculture improves resilience against climate change while enhancing productivity. Transitioning to organic and low-input farming methods reduces environmental harm and opens new market opportunities. Action Steps. Establish organic farming zones and certification centers, encourage crop rotation, composting, and biological pest control, support farmer cooperatives in obtaining organic certification for exports.

Integrate renewable energy into agricultural practices. Explanation: Using renewable energy sources in farming—like solar-powered water pumps and bioenergy for greenhouses—reduces dependency on fossil fuels and lowers carbon emissions. Action steps. Offer grants or tax incentives for installing solar/wind energy systems, launch pilot projects in remote areas to demonstrate energy self-sufficiency, partner with private energy providers to promote rural electrification.

Expand access to green finance and investment mechanisms. Explanation: Many farmers lack access to capital needed for transitioning to sustainable practices. Green finance tools, such as environmentally conditioned loans and sustainability-linked bonds, can fill this gap. Action Steps. Create a national green investment fund for agriculture, collaborate with international donors and banks to expand credit lines, link financing eligibility to environmental performance indicators.

Strengthen agricultural education and capacity building. Explanation: Human capital is essential for implementing green agricultural practices. Strengthening rural education and vocational training in agroecology, sustainable water use, and green technologies is critical. Action Steps: Integrate green economy principles into agricultural university curricula, organize regional training hubs for farmers and agronomists, support youth-led innovation in sustainable farming startups.

Foster digital transformation in agriculture. Explanation: Digital tools such as GIS mapping, smart sensors, drone monitoring, and agricultural mobile apps can improve decision-making, monitor resources, and increase efficiency. Action Steps: Develop national e-agriculture platforms for weather alerts, pest control, and market access, provide financial and technical support for AgTech startups, train rural farmers to use mobile-based agricultural services.

Improve institutional and policy frameworks. Explanation: Sustainable agriculture requires coherent policies and strong institutions. Effective coordination between ministries, local governments, and rural stakeholders is vital for successful implementation. Action Steps: Align agricultural strategies with the National Green Economy Roadmap, establish cross-sectoral bodies to coordinate sustainability goals, enforce environmental impact assessments for all major agro-projects.

Encourage regional and international cooperation. Explanation: Learning from global best practices and participating in regional initiatives can enhance Uzbekistan's green agricultural development. Action Steps: Strengthen partnerships with FAO, UNDP, ICARDA, and other international bodies, participate in regional knowledge-sharing platforms on sustainable agriculture, encourage transboundary cooperation on water and land resource management.

By implementing these recommendations, Uzbekistan can create a resilient, efficient, and environmentally responsible agricultural sector that not only sustains the livelihoods of rural populations but also supports the broader objectives of a green and inclusive economy.

To strengthen the role of agriculture in stabilizing Uzbekistan's green economy, the following actions are recommended:

- Establish a national platform for green agricultural innovation and knowledge exchange
- Encourage public-private partnerships for sustainable rural development
- Expand research in climate-smart agriculture
- Integrate green metrics into agricultural performance evaluation
- Foster international cooperation with organizations such as FAO, UNDP, and ICARDA

Conclusion. The transformation of Uzbekistan’s agricultural economy into a sustainable and green-oriented system is not only a national necessity but a global responsibility. With targeted investments, policy support, and international collaboration, the country can position itself as a model for agricultural-led green growth in Central Asia. The alignment of agricultural development with the principles of the green economy will ensure long-term food security, environmental protection, and economic prosperity.

The development of a sustainable agricultural economy is fundamental to stabilizing and advancing the green economy in Uzbekistan. As one of the most resource-intensive and employment-generating sectors, agriculture has a dual responsibility: to ensure food security and economic growth while minimizing environmental impact. This research has highlighted that without significant reforms in agricultural practices, water usage, land management, and technological integration, Uzbekistan’s efforts toward green economic transformation may fall short. The analysis demonstrates that adopting modern, eco-friendly technologies such as drip irrigation, organic farming, renewable energy systems, and digital agriculture can significantly improve productivity while reducing ecological damage. Moreover, strengthening institutional frameworks, providing financial incentives for sustainable practices, and fostering public-private partnerships are vital steps toward long-term green growth in rural areas. By aligning its agricultural policies with sustainability goals and international standards, Uzbekistan can unlock the full potential of its agro-based economy. This will not only contribute to reducing environmental degradation but also enhance the resilience of rural communities against climate change, stimulate green innovation, and support inclusive economic development.

In conclusion, the agricultural sector must be at the forefront of Uzbekistan's green economy strategy. Its transformation offers a promising path toward achieving national development priorities, fulfilling international climate commitments, and ensuring a balanced coexistence between economic prosperity and ecological integrity.

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