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THE PROBLEMS OF ENVIRONMENT AND GREEN ECONOMY

Alimova Saboxat Gaziyevna
Tashkent medical academy
Social sciences department, associate professor, PhD in Economics.
saboxat.alimova@mail.ru
+998998284330
Erkinova Sevinch
Tashkent Medical Academy
Management field 1 - stage student
+998 902527752

***Abstract**: This article identifies the most pressing environmental and other risks, as well as recommends policy changes and actions. Some of the issues discussed include measures to improve energy efficiency and landscape restoration programs, which simultaneously benefit the economy and the environment while also posing potential negative impacts on human health.*

***Key words:** environmental and economic problems, green economy, economic development, poverty reduction, air quality.*

INTRODUCTION

The year 2025 has been officially declared as the "Year of Environmental Protection and Green Economy" in our country. This announcement marks the beginning of a new phase dedicated to ensuring environmental sustainability and mitigating climate change.

A Roadmap for Transition to a Green Economy and Ensuring Green Growth until 2030 has been adopted in Uzbekistan. This plan includes measures aimed at addressing existing environmental and economic challenges to achieve green, sustainable, and inclusive development.

A recent report prepared by the World Bank, in cooperation with the Ministry of Economic Development and Poverty Reduction of Uzbekistan and other government agencies, analyzes the challenges and opportunities of the country's transition to a green economy. The report identifies the most pressing environmental and other risks while recommending policy changes and strategic actions. Some of these measures, such as improving energy efficiency and implementing landscape restoration programs, are designed to simultaneously benefit the economy and the environment.

Uzbekistan faces inefficiencies in water usage, and its energy consumption per unit of GDP is nearly three times higher than the average for Europe and Central Asia, and twice as high as that of neighboring Kazakhstan.

Moreover, air pollution from urban and industrial sources is exacerbated by dust storms carrying sand and degraded land particles. A significant portion of the population is regularly exposed to air quality levels considered harmful to human health.

LITERATURE REVIEW AND METHODOLOGY

At the 78th session of the United Nations General Assembly, President of Uzbekistan Shavkat Mirziyoyev emphasized:

"We are proud that our country is the homeland of great scholars and thinkers such as Al-Khwarizmi, Beruni, Imam Bukhari, Mirzo Ulugbek, and Alisher Navoi, who have made invaluable contributions to world science and culture."

Similar ideas were mentioned in Indian epics (Mahabharata and Ramayana) a century after the Avesta was written and appeared in Chinese chronicles 300 years later. However, it was only in

the 5th century BCE that ancient Greek philosophers like Heraclitus, Socrates, Hippocrates, Plato, and Aristotle began discussing ecological and environmental issues.

Speaking about the state of the environment today, President Mirziyoyev stated at the UN:

"The world is facing a serious environmental crisis. Climate change, biodiversity loss, and pollution are worsening the situation."

RESULTS

Given the country's agriculture-focused economy and high population density, one of Uzbekistan's key green priorities is to improve air quality and promote the sustainable use of land and water resources.

This can be achieved through landscape restoration, efficient water management, and air pollution reduction measures. Expanding sustainable land use practices is essential, and climate-smart agriculture can further enhance land sustainability.

Sectors that optimize both employment opportunities and environmental outcomes include healthcare, education, finance, and climate-resilient industries.

Since agriculture is the largest employment sector in Uzbekistan, transitioning to higher-value industries and optimizing land use through ecosystem services can create more green jobs and improve living standards.

Currently, many countries are facing a sharp decline in natural resources, including land and water, making their efficient use a pressing issue. Countries with advanced agriculture—such as the Netherlands, Israel, South Korea, Japan, the United States, and Germany—have implemented hydroponic farming in specialized greenhouses since the late 20th century.

Hydroponics (from the Greek words "hydro" – water and "ponos" – work) is a method of growing crops without soil, using water-based nutrient solutions in controlled environments. In hydroponic systems, essential factors for plant growth—such as temperature, humidity, heat, light, carbon dioxide, clean water, and essential nutrients—are artificially regulated.

This technology presents a profitable opportunity, even with a small investment, offering sustainable agricultural production while optimizing resource use.

DISCUSSION

By creating optimal growing conditions, the photosynthesis process in plants is enhanced, leading to increased accumulation of organic compounds, which promotes plant growth, development, and higher yields.

Key Advantages of Hydroponics:

1. No soil or manure is required.
2. Water consumption is reduced by 60-70%.
3. Heat usage in hydroponic greenhouses is 25-30% lower compared to traditional greenhouses.
4. Vegetable ripening time is shortened by 20-30 days, while the harvest period is extended by 50-60 days.
5. Crop yield in hydroponic systems is 2 to 2.5 times higher than in traditional greenhouses.
6. Water and nutrient solutions are delivered directly to plant roots through a drip irrigation system.
7. No need for soil preparation, fertilization, plowing, irrigation furrows, mineral fertilizers, or weed control.
8. No negative impact on the environment, as hydroponic technology prevents soil contamination from excess fertilizers and pesticides, which can cause long-term ecological damage.

Hydroponics offers a highly efficient, sustainable, and eco-friendly method of agricultural production, optimizing resource use while increasing crop quality and yield.

Calculation of Profitability: Traditional Farming vs. Hydroponics per 1m²

1. Traditional Farming:

• Yield: 4–6 kg per m² (2 harvests per year)
• Product Price: 8,000 UZS per kg
• Annual Revenue:
• Minimum: 4 kg × 8,000 = 32,000 UZS
• Maximum: 6 kg × 8,000 = 48,000 UZS
• Annual Expenses: 40,000 UZS
• Net Profit:
• Minimum: 32,000 – 40,000 = -8,000 UZS (loss)
• Maximum: 48,000 – 40,000 = 8,000 UZS (profit)

2. Hydroponics:
• Yield: 30–45 kg per m² (3–4 harvests per year)
• Product Price: 20,000 UZS per kg
• Annual Revenue:
• Minimum: 30 kg × 20,000 = 600,000 UZS
• Maximum: 45 kg × 20,000 = 900,000 UZS
• Annual Expenses: 130,000 UZS

• Net Profit:
• Minimum: 600,000 – 130,000 = 470,000 UZS
• Maximum: 900,000 – 130,000 = 770,000 UZS

Estimated Investment Costs for 1m² of Hydroponics

1. Initial Capital Investment (One-time Expenses):
• Hydroponic system equipment (pipes, pumps, tanks): 200,000 UZS
• Water circulation system and filters: 50,000 UZS
• Lighting equipment (LED lamps): 70,000 UZS
• Greenhouse or climate control systems (if applicable): 100,000 UZS
• Monitoring sensors and automation system: 50,000 UZS
• Total Initial Capital Investment: 470,000 UZS (one-time expense)
2. Operational Costs (Annual):
• Fertilizers and nutrients: 50,000 UZS
• Water consumption (minimal usage): 10,000 UZS
• Electricity costs: 30,000 UZS
• Technical maintenance and repairs: 40,000 UZS
• Total Annual Operational Costs: 130,000 UZS

Total Cost Analysis
• First Year (Capital Investment + Operational Costs):
• 470,000 + 130,000 = 600,000 UZS
• Subsequent Years (Only Operational Costs):
• 130,000 UZS per year

This analysis demonstrates that hydroponics offers significantly higher profitability and efficiency compared to traditional farming, despite requiring an initial investment.

CONCLUSION

By adopting the right mix of environmental protection policies and reforms, the country can reap the benefits of a green, resilient, and inclusive future. In a global green transition that presents numerous opportunities for economic growth and development, Uzbekistan must implement sustainable policies to secure its future. Attracting advanced technologies and supporting capacity building are essential prerequisites for establishing a sustainable and prosperous future.

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