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AIR POLLUTION IN TASHKENT CITY AND ITS IMPACT ON THE "GREEN ECONOMY"

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Abstract
This article analyzes the current state of air pollution in the city of Tashkent and its impact on the transition to a "green economy." Global climate change and declining air quality are becoming serious challenges for major cities in the context of urbanization. The author identifies the main causes of this situation, including the intensity of vehicle traffic, the use of low-quality fuel, the reduction of green zones, and the lack of effective environmental control. The research proposes strategic measures to combat air contamination and stresses the importance of political will and a systemic approach in their implementation.

Keywords: Tashkent city, air pollution, green economy, PM2.5, urbanization, ecological environment, sustainable development, environmental policy, transport reform, green areas.

INTRODUCTION

In recent decades, global climate change and the processes of industrialization and urbanization have posed serious threats to the ecological balance of the planet. In particular, major cities — where populations are densely concentrated and traffic is intense — are experiencing dramatic declines in air quality and loss of natural green areas. This situation creates urgent challenges for public health, economic stability, and environmental safety.

The capital of the Republic of Uzbekistan, Tashkent, is no exception to this global trend. In recent years, the concentration of harmful substances in the city's atmosphere — particularly PM2.5 and NO_2 — has reached high levels, which are also reflected in international environmental ratings. At the same time, the Government of Uzbekistan has declared the "green economy" concept as one of the key directions of its sustainable development strategy. However, the deterioration of the ecological environment poses serious challenges for the effective implementation of this strategy.

This research aims to identify the main causes of air pollution in Tashkent, analyze its impact on the quality of life and economy, and examine the complexities involved in transitioning to a green economy. The article also presents practical recommendations to solve existing problems, which may contribute to improving environmental health and ensuring sustainable development in the city.

Studies identify the main sources of air contamination in Tashkent as excessive motor vehicle use, low-quality fuel, unregulated construction activity, and reduction in green areas. At the same time, deficiencies in environmental infrastructure and control

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mechanisms are deepening the problem. Air quality standards are often violated multiple times, with PM2.5 concentrations significantly exceeding safe limits set by the World Health Organization (WHO).

LITERATURE REVIEW AND METHODS

This research analyzes air pollution in Tashkent and its effects on the green economy using several methodological approaches:

Comparative Analysis: The concentration of harmful substances in Tashkent's atmosphere was compared with the norms defined by the World Health Organization (WHO), identifying their scale and negative consequences. Comparative analysis with other highly urbanized cities was also conducted.

Environmental Statistical Analysis: The monthly and annual variations of PM2.5, NO_2, and other harmful substances were studied based on statistical data to determine their effects on human health and the living environment. Diagrams and dynamic indicators were used to analyze trends.

Policy and Document Analysis: The concept of the green economy, state decisions on environmental safety, moratoriums, and regulatory documents were examined to evaluate their practical effectiveness.

RESULTS AND DISCUSSIONS

Air pollution under conditions of urbanization has become a major obstacle to sustainable development, especially in large cities such as Tashkent. According to national environmental monitoring data and international reports, the level of harmful substances in the city's atmosphere has significantly increased in recent years.

By early 2024, Tashkent was regularly ranked among the world's most polluted cities in terms of air quality. This raises serious concerns not only for public health but also for Uzbekistan's green economy transition strategy.

The analysis shows that the primary cause of air pollution is intensive vehicle movement. According to data from the Ministry of Ecology, over 800,638 cars are registered in the capital, and more than 300,000 vehicles enter the city daily. This dramatically increases the concentration of waste gases and fine particulate matter like PM2.5.

The situation is further exacerbated by chaotic construction. Despite a moratorium on tree cutting, more than 49,000 green plants were illegally removed in 2023, undermining the city's natural air purification capacity. Moreover, the widespread use of low-quality fuel such as AI-80, along with the use of fuel oil and coal during the heating season, leads to increased emissions of toxic sulfur compounds and soot.

According to reports by Uzhydromet and IQAir, in January–February 2024, PM2.5 levels in Tashkent's air reached 224 $\mu g/m^3$ — more than 40 times the WHO

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recommended limit. A monthly dynamics diagram illustrates the progression of pollution.

Thus, air pollution in Tashkent is a systemic environmental threat that hampers the objectives of the green economy. It contributes to increased disease rates, reduced labor productivity, and decreased attractiveness for capital investment. These results demonstrate the urgent need for environmental reform, including modernization of the transport system, adoption of clean energy sources, and restoration of green areas.

Survey results show that air pollution is not just a local problem but a serious threat to the country's sustainable development. High concentrations of harmful substances, especially PM2.5 and NO_2, directly affect life expectancy, reduce labor capacity, and increase pressure on the healthcare system. According to WHO, air pollution is one of the main causes of premature death in urban areas.

Existing pollution levels pose a serious barrier to sustainable solutions for the green economy. First, the deteriorating environmental situation reduces the attractiveness of the territory for companies committed to ESG (Environmental, Social, Governance) principles. Second, it hampers the development of eco-tourism and environmentally friendly agriculture in the surrounding areas.

The loss of green spaces deserves special attention. Under conditions of a harsh continental climate and high population density, trees play a critical role in regulating the microclimate, lowering temperatures, and filtering the air. Despite the moratorium, mass tree-cutting further exacerbates the spread of harmful substances.

From a strategic standpoint, the following key measures are necessary:

- Development and subsidization of environmentally friendly public transport (electric buses, cycling infrastructure);
- Phasing out AI-80 fuel and tightening fuel quality standards;
- Mandatory environmental assessment of all construction projects within the city;
- Restoration of green belts around Tashkent, especially in industrial and densely populated areas;
- Introduction of online air quality monitoring systems and making data publicly available.

CONCLUSION AND RECOMENDATIONS

These measures can only be implemented effectively if there is strong coordination between ministries and political will. Solving the problem of air pollution requires a systematic and long-term approach. Improving Tashkent’s environmental health is a crucial step toward implementing the green economy concept, enhancing the quality of life, and creating a positive international image for the country.

To stabilize Tashkent’s environmental situation and develop a green economy, the following measures should be prioritized:

1. **Development of clean transport**: Increase the number of electric vehicles and bicycles, expand cycling infrastructure, limit the use of private cars, and promote public transport use through incentives.

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2. **Improving fuel quality**: Gradually phase out AI-80 fuel, introduce new fuel quality standards, and ensure strict control.
3. **Eco-sensitive urban planning**: Mandate environmental assessments for all construction projects; expand green areas, especially in industrial and high-density zones.
4. **Monitoring and transparency**: Improve air quality monitoring systems; provide real-time data through online platforms and raise public awareness.
5. **Political and institutional coordination**: Strengthen implementation of environmental policies by improving coordination between ministries, local authorities, businesses, and civil society.

These recommendations will play a vital role in enhancing environmental sustainability in Uzbekistan, advancing the green economy, and improving the quality of life for its citizens.

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