

Environmental Standards in Urban Planning and Their Application

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ABSTRACT

Objective: This article examines the legal foundations of environmental standards in the field of urban planning in Uzbekistan, the challenges in their practical implementation, and ways to improve them. It analyzes pressing environmental issues such as the acceleration of urbanization, air pollution, the reduction of green areas, and illegal construction. **Method:** Environmental requirements are reviewed based on the Urban Planning Code and relevant regulatory documents. A comparative analysis is conducted with international experience, including European Union directives and the "smart city" models of Singapore and Dubai. **Results:** The proposed recommendations focus on digitalizing monitoring systems, developing the "green city" concept, and strengthening regulatory oversight. **Novelty:** The study contributes to sustainable urbanization and the transition to a green economy.

INTRODUCTION

As Uzbekistan continues to experience steady economic growth, the field of urban planning is also developing rapidly. In recent years, the level of urbanization in the country has increased significantly and, by 2025, has reached 51% of the total population. The "Uzbekistan – 2030" Strategy envisages increasing the urbanization rate from 51% to 60% by 2030.

Urbanization creates favorable living conditions for the population; however, escalating environmental problems place the urban environment at serious risk. In particular, during the autumn–winter seasons, air pollution in Tashkent has increased sharply. In November 2025, the city was recorded as one of the most polluted cities in the world [1]. Such levels of air pollution significantly exceeded the standards established by the World Health Organization [2]. In addition, urban green areas are rapidly declining, with recent studies highlighting the widespread removal of urban trees. The issue of illegal construction also remains pressing, contributing to environmental damage and a decline in the quality of life of the population. These examples reflect a broader trend. At a time when environmental problems have taken on a global dimension, including in Uzbekistan, the effective implementation of legislative norms in the field of urban planning has become an urgent issue for all stakeholders.

The primary cause of the problem lies in the failure to effectively enforce legislative norms in practice. Although environmental standards exist within Uzbekistan's legal framework, their practical implementation remains insufficient. The revised Urban Planning Code, along with other environmental legislation, provides for the preservation and expansion of green areas, the prevention of air pollution, and the reduction of harmful emissions from transport and industrial enterprises [3]. Nevertheless, non-compliance with these regulations continues to result in illegal construction, increased industrial waste, and rising transport emissions.

The purpose of this article is to analyze the legal foundations of environmental standards in the field of urban planning, identify problems in their practical implementation, and propose ways for their improvement.

To achieve this objective, this study addresses the following tasks:

- To examine Uzbekistan's legal framework in the fields of urban planning and environmental protection.
- To compare international experience (for example, environmental standards in urban planning in the European Union and Asian countries) and assess the possibilities of adapting them to Uzbekistan.
- To analyze the practical situation in Uzbekistan, particularly the application of environmental standards in Tashkent and other cities.
- To identify existing problems, including illegal construction and the reduction of green areas.
- To propose improvement measures, including the introduction of new monitoring mechanisms and systems.

The scientific novelty of the study lies in its analysis of recent developments, including new regulations from 2024–2025 (such as the ecological expertise, environmental impact assessment, and strategic environmental assessment law adopted in 2025) and the “Green Economy” program. This program designated 2025 as the “Year of Environmental Protection and Green Economy” [4]. Through this analysis, this study proposes new approaches for improving environmental standards in urban planning, contributing to the country's sustainable development.

RESEARCH METHOD

The methodology of this study includes legal analysis, comparative law methods, statistical data (such as urbanization and pollution indicators), and the analysis of regulatory documents. The research utilizes data from the World Bank, the United Nations, and the Ministry of Ecology of Uzbekistan.

RESULTS AND DISCUSSION

Results

A. Legal Framework in Uzbekistan

In the Republic of Uzbekistan, the legal foundation for environmental standards in the field of urban planning is the Constitution, which should be analyzed first.

Article 49 of the Constitution of the Republic of Uzbekistan states: “Everyone has the right to a favorable environment and reliable information about its condition. The State shall create conditions for public oversight in the field of urban planning to ensure citizens’ environmental rights and prevent harmful impacts on the environment. Draft urban planning documents shall be subject to public discussion in accordance with the procedure established by law. In line with the principle of sustainable development, the State shall implement measures to improve, restore, and protect the environment and maintain ecological balance. The State shall also take measures to protect and restore the ecological system of the Aral Sea region and to ensure its social and economic development” [5]. The Constitution serves as the basis for all normative legal acts. Focusing on the provisions of this article, it is clear that every individual has the right to a favorable environment. This right, in turn, imposes specific obligations on the State. The article itself confirms this: the State, in accordance with the principle of sustainable development, undertakes measures to improve, restore, and protect the environment and to maintain ecological balance. From this, it can be concluded that environmental protection and urban planning standards are enshrined at the highest legal level in the country, namely at the constitutional level.

The Urban Planning Code of the Republic of Uzbekistan is an important legal document designed to regulate construction and urban development in the country. This code establishes the necessary rules and standards for developing cities, planning residential areas, and supervising construction activities. The Urban Planning Code is a directly applicable law that ensures the unity of the legislative framework and its legal enforcement system. Urban planning activities involve state authorities, local self-government bodies, legal entities, and individuals in the planning of territorial and settlement development, determining land use types, producing construction materials and goods, and designing, constructing, and reconstructing buildings, structures, and complexes. All of these activities must take into account the interests of individuals, society, and the state, as well as the national, historical-cultural, ecological, and natural characteristics of the respective territories and settlements.

Furthermore, the Urban Planning Code strictly requires that urban planning documents (such as master plans and detailed planning projects) comply with environmental standards, including adherence to fire safety and ecological norms. According to Clause 14 of the Presidential Decree on measures for organizing the activities of state bodies in environmental protection and ecological control, the State Committee for Ecology was tasked with preparing a draft Environmental Code by December 1, 2022, involving broad public participation, research institutions, civil society organizations, and media representatives, and submitting it to the Cabinet of Ministers in the prescribed manner. However, to date, a separate Environmental Code has not yet been adopted. If this document is enacted, it will consolidate numerous normative legal acts related to environmental protection and serve as the primary legal framework in this field.

Currently, environmental relations are regulated by the Law “On Environmental Protection,” the Law “On Protection of Atmospheric Air,” as well as presidential resolutions (for example, PQ-343, dated November 18, 2025 – “On Measures to Organize the Activities of the National Committee on Ecology and Climate Change of the Republic of Uzbekistan”) [6]. These legal acts establish requirements for environmental expertise and monitoring in urban planning projects.

Resolutions of the Cabinet of Ministers and departmental orders also play an important role. For instance, the order of the Minister of Justice titled “On Approving the Rules for Preparing, Legally Reviewing, and Registering Urban Planning Standards and Regulations, Phytosanitary Requirements, Sanitary Rules and Norms, Hygiene Standards, Ecological Norms and Rules, and Veterinary and Veterinary-Sanitary Rules and Norms” is noteworthy. This document, registered as a departmental normative legal act by the Ministry of Justice, aims to create a unified legal framework for technical documents, including urban planning standards and regulations, as well as sanitary, phytosanitary, ecological, and veterinary norms.

SHNQ 2.07.01-23 – “Planning the Development and Construction of Settlement Territories from an Urban Planning Perspective” is a key normative legal document approved by the Ministry of Construction and Housing and Communal Services of the Republic of Uzbekistan [7].

This regulatory document establishes mandatory requirements for the urban planning, design, reconstruction, and construction of settlement territories, including cities and rural settlements.

It pays particular attention to the following aspects:

- The proportion of green zones, recreational areas, and water bodies, as well as the protection of riverbanks in master plans and detailed planning projects;
- The location of industrial, manufacturing, and warehouse zones;
- An ecologically safe transport system and road network;
- Sanitary protection zones and distance restrictions from pollution sources (industrial enterprises, landfills, noise sources);
- Sites for waste collection, disposal, and management;
- Environmental protection measures, noise levels, and other ecological restrictions.

This SHNQ is based on the requirements of the Urban Planning Code of the Republic of Uzbekistan and, in particular, ensures the mandatory consideration of ecological safety and environmental protection principles in urban planning activities. All urban planning documents must undergo an environmental review and be coordinated with the relevant ministry (currently, the State Committee for Ecology).

B. International Experience in Environmental Standards

In international practice, the application of environmental standards in urban planning focuses on sustainable development, environmental protection, and improving the quality of life for the population. In studying international experience, it is useful to examine the European Union (EU), “smart city” models (Singapore and Dubai), as well as neighboring countries such as Russia, Kazakhstan, and China.

European Union Experience: EIA and SEA

In the European Union, urban planning projects and plans are regulated through a two-stage environmental assessment system. The first stage is carried out under the Environmental Impact Assessment (EIA) Directive. The second stage is conducted under the Strategic Environmental Assessment (SEA) Directive [8].

The Environmental Impact Assessment (EIA) Directive makes such an assessment mandatory for individual construction projects. It requires the prior evaluation of a project's negative effects on the environment, consideration of alternative options, and the implementation of mitigation measures.

The SEA Directive (Strategic Environmental Assessment) applies to urban planning plans, master plans, detailed planning projects, and programs [9]. This directive ensures the integration of environmental factors such as air, water, biodiversity, and climate change during the development of urban planning documents. The SEA process includes scoping (identifying key issues), preparing an environmental report, public consultation, monitoring, and incorporating environmental recommendations into decision-making. This system supports the preservation of green areas, reduction of pollution, and promotion of sustainable urban development.

In European Union countries, such assessment processes are mandatory. Master plans for cities take into account the proportion of green areas (at least 20–30%), emission limits, and climate adaptation measures. As a result, many cities have effective green infrastructure and environmental monitoring systems.

Previously, Uzbekistan had the Law "On Environmental Expertise." However, this law was insufficient to meet the requirements of ongoing reforms and projects in the country. A revised legal framework for environmental expertise would align more closely with international best practices and correspond to the two directives applied in European Union countries.

Currently, developed countries are implementing projects under the "Smart City" concept, driven by the need to protect the environment and elevate urban development to a new level as part of sustainable development. Singapore and Dubai, for instance, are actively testing "Smart City" initiatives.

Singapore, under its "Smart Nation" program, is a leading country in combining ecological monitoring with green urban planning [10]. The Virtual Singapore project creates a digital twin of the city, monitoring air quality, noise, water consumption, and green belts in real time. In areas like the Punggol Digital District, authorities have implemented energy-efficient buildings, centralized cooling systems, and sensor-based waste management. Nearly 47% of Singapore's urban area consists of green zones [11]. The "City in a Garden" concept includes green walls and vertical gardens, and aims to reduce carbon emissions by 2030.

In Dubai, the "Dubai Plan 2021" and "Dubai Urban Plan 2040" integrate smart city initiatives with sustainability goals [12]. The Sustainable City project operates using solar energy, energy-efficient buildings, and a waste recycling system. Masdar City is a zero-carbon urban development that uses artificial intelligence and IoT technologies to

monitor energy and water consumption. In Dubai, ecological zoning including green corridors and green pathways – along with mandatory LEED/BREEAM standards, helps reduce the urban heat island effect and air pollution.

In Russia, ecological zoning in urban planning has traditionally been regulated through sanitary norms, which required green areas to make up at least 40% of urban territories, although in major cities this proportion is often lower in practice [13]. Ecological zoning primarily focuses on creating buffer zones between industrial and residential areas.

Urban planning standards in Kazakhstan are similar to those in Russia. However, in rapidly urbanizing cities such as Almaty and Astana, challenges remain with air pollution and the reduction of green spaces [14]. Although ecological zoning exists in the legal framework, monitoring remains insufficient.

In China, the national garden city scheme aims to ensure that the percentage of green spaces in urban areas is at least 36–40%. Ecological zoning is implemented by separating industrial zones from residential areas and creating green spaces. Nevertheless, rapid industrialization continues to pose pollution challenges.

C. Practical Implementation of Environmental Standards in Uzbekistan: Current Situation and Challenges

Although Uzbekistan has clear legislative acts regulating the application of environmental standards in urban planning, significant gaps remain in practice. The example of Tashkent illustrates this situation, as the capital is at the center of urbanization, pollution, and green space challenges. The master plan for the development of Tashkent, projected until 2045, was developed with environmental requirements in mind. The plan envisions expanding the city area to 43.7 thousand hectares, creating 10 thousand hectares of additional green spaces, and establishing a 15-thousand-hectare green belt around the city. Currently, Tashkent's green areas amount to approximately 7–9 thousand hectares, which is about 13–15% of the city's total area. The master plan aims to significantly increase this, including the creation of a "green belt" along the outer ring road and thematic parks along canals. The "New Tashkent" project allocates 23% of its territory to public green spaces, which aligns more closely with international standards. However, in the current situation, the share of green areas (around 13–15% in Tashkent) remains 25–30% below international norms.

Environmental Expertise Process

The environmental expertise process in Uzbekistan operates in accordance with the Urban Planning Code and the requirements of the State Committee for Ecology and Climate Change. Any major construction project must undergo state environmental expertise. For new multi-story residential complexes, project documents are required to include sections on emissions accounting, waste management, and green zoning. Under the strategy for the transition to a 'green economy' by 2030, efforts are underway to increase environmental monitoring and establish green belts around industrial zones [15].

There are only a limited number of consistent examples of compliance with environmental requirements in construction projects: new multi-story buildings are increasingly encouraged to incorporate sustainable design elements, though implementation varies. In many projects, these requirements are not enforced in practice. The main problem is the lack of actual compliance with these standards. In Tashkent, unauthorized constructions and the destruction of green zones are widespread. In the capital, unauthorized construction projects initiated without required permits or environmental expertise have been a persistent challenge, and in some cases, citizens are being sold housing unlawfully. Green areas are declining sharply recent years have seen a reduction in vegetated areas, exacerbating urban heat effects and pollution levels.

Weaknesses in Oversight

Coordination between the State Committee for Ecology and Climate Change and local authorities is insufficient. Construction control and environmental monitoring are separated, which complicates the timely detection of violations. Resource limitations are also critical: the number of monitoring devices is limited, and there is a shortage of qualified specialists and laboratory facilities.

In conclusion, the practical implementation of environmental standards in Uzbekistan is less robust than the legal framework would suggest. As illustrated by the situation in Tashkent, the reduction of green areas, air pollution, and inadequate oversight pose serious threats to public health and sustainable development. To address these challenges, it is necessary to strengthen monitoring, improve coordination, and introduce mechanisms for public oversight.

Discussion

Ways to Improve and Recommendations

Comprehensive measures are needed to ensure the effective application of environmental standards in urban planning and the protection of the environment in Uzbekistan. These measures should focus on strengthening the legal framework, adopting international best practices, implementing the “green city” concept within national strategies, and most importantly ensuring the enforcement of existing legislation.

One of the most critical priorities is the strengthening and digitalization of monitoring systems. It is necessary to create a unified digital ecological platform under the State Committee for Ecology and Climate Change, enabling real-time monitoring of air quality, noise, waste, and green spaces. Existing automated stations in Tashkent should be expanded, and advanced technologies such as “digital twin” systems, similar to those in Singapore, should be piloted. To track environmental violations in industry, construction, and other sectors, a centralized monitoring system should be established under the State Committee for Ecology and Climate Change, providing comprehensive oversight and timely responses.

Furthermore, coordination between relevant agencies the State Committee for Ecology and Climate Change, local authorities, and the Ministry of Construction should

be strengthened. Working groups need to be established, and responsibilities clearly defined. To address resource shortages, collaboration with international donors and grant organizations (such as the World Bank, GGGI, and others) should be enhanced, along with programs for training specialists [16]. By adopting international experience, EIA and SEA systems can be further improved, and AI and IoT technologies (sensors, optimized waste management) can be widely applied based on Singapore and Dubai's "smart city" models. It is recommended to make green building standards such as LEED, BREEAM, and EDGE mandatory for new projects and to strengthen the creation of "green belts" between industrial and residential zones.

The development of the "green city" concept should be implemented nationally within the framework of the "Uzbekistan - 2030" strategy and the "Year of Environmental Protection and Green Economy" programs. This includes increasing the share of urban areas devoted to green zones, reducing carbon emissions, and implementing sustainable transport systems (electric vehicles, bicycle infrastructure). Expanding the nationwide "Green Space" project and transforming "New Tashkent" into a "green capital" model can serve as an example for the entire country.

Practical Recommendations for Tashkent

For Tashkent, practical measures include revising ecological zoning, establishing protective green belts around industrial zones, implementing vertical gardens and green walls, enforcing strict control and penalties against illegal construction, and increasing public participation. According to the master plan, it is necessary to accelerate the creation of additional green areas and attract investment to significantly improve waste recycling rates.

CONCLUSION

Fundamental Finding: The results of this study indicate that existing legal requirements such as environmental expertise, minimum shares of green areas, and sanitary protection zones must move beyond paper and be effectively implemented in practice. This requires digitalizing monitoring systems, strengthening inter-agency coordination, adapting international experience (EIA/SEA directives, Singapore and Dubai models), and broadly implementing the "green city" concept within national strategies such as "Uzbekistan - 2030" and the "Green Economy" program. **Implication:** If these improvement measures are implemented gradually, Uzbekistan's cities can become environmentally clean, comfortable for residents, and follow a path of sustainable development. As a result, carbon emissions will decrease, green spaces will increase, and the quality of life for the population will improve. **Limitation:** A notable limitation of this study is its primary focus on qualitative legal analysis and comparative policy frameworks, which lacks quantitative modeling or empirical data regarding the exact compliance rates of current construction projects. Additionally, the evaluation relies heavily on national strategies and urban models from high-income regions like Singapore and Dubai, which may not fully account for the unique socioeconomic constraints, localized enforcement challenges, and regional governance structures across different

municipalities within Uzbekistan. **Future Research** : Future research should focus on conducting empirical case studies that utilize GIS-based spatial tracking and remote sensing data to measure real-time changes in urban green spaces and air quality against specific regulatory enforcement actions. Furthermore, subsequent studies are recommended to investigate the socio-economic impacts and cost-benefit dynamics of implementing "smart city" technologies, exploring how local community engagement and updated municipal zoning codes can facilitate the practical transition to a green economy.

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