

**IMPACT OF CLIMATE CHANGE ON URBAN LANDSCAPE ORGANIZATION  
IN UZBEKISTAN**

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**Abstract:** *Uzbekistan, located in the heart of Central Asia, faces unique problems due to climate change. Rising temperatures and unpredictable weather conditions demand attention and innovative solutions for the country's urban landscapes.*

*This article examines in detail the impact of climate change on the organization of urban landscapes in the conditions of Uzbekistan. It takes a focused regional approach, analyzing how it affects Uzbekistan's urban centers, infrastructure, and local communities. By integrating climate data, environmental factors, and social dynamics, the research explores the complex interactions between climate change and urban development in the region, the emergence of urban heat islands, climate change, and urban settlements, and considers its implications for the design of public and administrative buildings. It emphasizes the importance of local participation, governance, and tailored adaptation measures in shaping the urban landscape to address climate change challenges.*

*This article provides important insights for policymakers, urban planning researchers, environmental researchers, and local stakeholders facing similar climate challenges in Uzbekistan and other regions. It is necessary to recognize climate change as a decisive factor in the organization of the urban landscape and to organize projects taking into account the problems arising from the increase in energy consumption as a result, as well as the techniques of using renewable energy sources, and preventing the problems of water scarcity caused by the increase in temperature. It offers suggestions for irrigation systems for plants in urban landscape design.*

**Keywords:** *climate change, urban landscape, heat islands, green space, GIS, water scarcity, renewable energy sources*

Climate change is a widespread, rapid, and accelerating process. Even for those living in the West, the threat of global warming is no longer a problem that only affects remote areas. People living in almost all parts of the world feel the effects of climate change on their bodies. [1]

The average temperature on planet Earth is a little more than 1°C, which is actually worse than we think. Between 1980, when data began to be recorded globally, and as of 2017, the planet's temperature has increased by 1°C. This number may not seem significant, but if we look at it as an average of the planet's surface, we can see that the change is large, resulting in melting glaciers and a dramatic rise in sea levels. If the emission of greenhouse gases does not stop, scientists predict that the average temperature of the planet will increase by 4 degrees Celsius. This makes most of the land unfit for human life. [2]



The hottest weather in the last 150 years was observed in 3 of the last 5 years in Uzbekistan. The frequency of unseasonal cooling and warming anomalies continues to increase, and the number of hazards it causes continues to increase. After 2000, warming reduced the contribution of cold currents entering Uzbekistan from 22% of the year to 10%. According to alarming forecasts, this indicator will continue to decrease in the future.

The decrease in the weight of cold currents increased the local air currents in the republic and, after them, increased the activity and periodicity of warmer currents from the southern subtropical countries. These unusual changes increased the intensity of strong winds at the border of the currents.

The warming of the climate and the increase in carbon dioxide in the air have led to a slight increase in air humidity. But it is unevenly distributed in the region. The emergence of the Aydarkol lake system was reflected in the slight increase in humidity in the regions of Jizzakh, Navoi, and Samarkand around the lake, and in the increase of heavy rains this spring-summer and even in the warm winter months. [3]

Below, we will consider the negative consequences of drastic climate change and measures to eliminate them.

#### 1. Temperature rise and urban heat islands (UHI)

One of the most visible consequences of climate change in Uzbekistan is the constant rise in temperature. This warming trend has created a phenomenon known as Urban Heat Islands (UHI). UHIs are localized areas in urban areas that exhibit significantly higher temperatures than the surrounding countryside. They appear due to factors such as the reduction of the heat transfer properties of concrete and asphalt and the increase in energy consumption. The main consequences of UHI in Uzbekistan [4] are as follows:

**Health problems:** rising temperatures make urban residents more susceptible to heat-related illnesses, especially the elderly and children. Heat waves are frequent and intense, posing a serious threat to public health.

**Energy demand:** the heat makes people rely more on air conditioning and cooling systems, which causes an increase in energy demand. This not only puts pressure on energy resources but also contributes to greenhouse gas emissions.

**Air quality problems:** UHIs can trap air pollutants, producing poor air quality. This increases respiratory problems among city residents and poses serious health risks.

#### 2. Water scarcity and drought

Uzbekistan's vulnerability to water scarcity is exacerbated by climate change, which causes changes in precipitation and evaporation rates. The nation relies mainly on the Amudarya and Syrdarya rivers for water, but these important sources are dwindling due to increased evaporation and reduced snowmelt from the mountains.

**Green space challenges:** maintaining urban greenery becomes challenging as water becomes scarcer. Parks, gardens, and recreation areas reduce the quality of urban life.

**Impact on agriculture:** water scarcity affects not only cities but also the agricultural sector, which plays a crucial role in the economy of Uzbekistan. Crop yields will be reduced and will affect food security.



### 3. Floods and extreme weather events

Climate change also brings unpredictability to Uzbekistan's weather conditions. Although the country faces water scarcity, it is also prone to extreme weather events such as heavy rains and floods. Cities must adapt to these changing conditions:

**Infrastructure vulnerability:** inadequate stormwater management and aging infrastructure increase the risk of flooding. Many cities cannot withstand the sudden appearance of rainwater.

**Urban planning and design:** To reduce the risk of flooding, urban planning and design should include robust infrastructure such as efficient drainage systems and flood-resistant construction.

### 4. Sustainable city planning and adaptation

In response to these problems, Uzbekistan uses sustainable urban development and adaptation measures. Key strategies include:

**Green infrastructure:** Increase urban green spaces, create urban forests, and improve tree canopies to combat UHI.

**Efficient water management:** implementing sustainable water management practices such as rainwater harvesting and efficient irrigation systems to address water scarcity.

**Climate-resilient infrastructure:** designing and constructing climate-resilient buildings and transportation systems that can withstand extreme weather conditions.

**Public awareness:** educating the public about the risks of climate change and the importance of sustainable living practices.

**Government initiatives:** The government of Uzbekistan is investing in climate-resilient urban development, green infrastructure projects, and climate-friendly building projects to increase the resilience of urban landscapes. [5]

## CONCLUSION

The impact of climate change on the urban landscape of Uzbekistan is undeniable and multifaceted. Rising temperatures, UHI, water shortages, and extreme weather events pose major challenges for the country's cities and their residents. However, Uzbekistan is meeting the challenge by implementing sustainable urban planning, green initiatives, and climate-resilient infrastructure projects. By adopting these strategies and raising public awareness, Uzbekistan is working to create a more resilient and sustainable urban landscape that can thrive in a changing climate.

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