# ECOLOGICAL CHARACTERISTICS OF OASIS SHRINES AND THE CHANGES OCCURRING IN THEIR NATURAL ENVIRONMENT

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**Abstract.** This thesis examines the ecological characteristics of pilgrimage sites located within the oasis landscapes of Uzbekistan and analyses the environmental changes affecting their natural surroundings. Particular attention is given to the relationship between sacred places, water resources, soil conditions, vegetation, climatic factors, and human activities. Oasis shrines represent not only historical and religious heritage but also important elements of the cultural landscape, whose preservation is closely connected with environmental sustainability. The research considers the ecological conditions of the Bukhara, Kashkadarya, and Samarkand oases and identifies the major natural and anthropogenic factors influencing their transformation. The findings emphasise the need to integrate environmental protection principles into the management and sustainable development of pilgrimage destinations.

**Keywords:** oasis landscapes, pilgrimage sites, ecological characteristics, environmental changes, water resources, soil degradation, vegetation, sustainable tourism.

## Introduction

Oasis landscapes have historically played an important role in the formation and development of settlements, religious centres, and cultural traditions in Central Asia. In Uzbekistan, many pilgrimage sites emerged within oasis environments where the availability of water, fertile soils, vegetation, and favourable settlement conditions contributed to the establishment of religious and cultural centres. These locations have maintained their spiritual significance over centuries and continue to attract domestic and international visitors. The ecological characteristics of oasis shrines are determined by the interaction of natural geographical conditions and human activities. Water availability, climatic conditions, soil composition, vegetation, and landscape stability directly influence the environmental condition of pilgrimage destinations. At the same time, urbanisation, agricultural expansion, tourism infrastructure, and increasing visitor numbers create additional pressure on these environments. Therefore, investigating the

ecological characteristics of oasis shrines requires an integrated approach that considers both their natural environment and the historical processes of human interaction with the landscape.

**Ecological Characteristics of Oasis Shrines**

One of the most important ecological characteristics of oasis shrines is their close relationship with water resources. Historically, many sacred places were established near springs, rivers, canals, wells, and other sources of freshwater. Water was not only essential for everyday life but also occupied an important position in religious traditions and cultural practices. The Bukhara Oasis provides an illustrative example of the relationship between natural resources and historical settlement development. Located within the delta of the Zarafshan River, the oasis is characterised by an arid climate, relatively low precipitation, high summer temperatures, and a strong dependence on artificial irrigation systems. These geographical conditions have influenced the formation of its settlement patterns and cultural landscapes [1].

Another characteristic feature of oasis shrines is the presence of vegetation surrounding sacred places. Trees, gardens, and green areas often create a distinctive microclimate, provide shade, reduce dust, and contribute to the visual and ecological attractiveness of pilgrimage destinations. In some locations, trees and natural springs have also acquired symbolic and cultural significance. Soil conditions represent another important ecological component. Oasis territories are exposed to various processes, including salinisation, erosion, groundwater fluctuations, and soil degradation. These processes can affect vegetation growth, landscape stability, and the condition of historical monuments. The ecological environment of the Kashkadarya Oasis also demonstrates the close relationship between natural landscapes, traditional practices, and sacred places. Research by S. N. Djuraeva and D. V. Alinazarova on shrines associated with ecotourism in the Kashkadarya Oasis highlights the significance of natural, spiritual, and material heritage in the development of regional tourism [2].

**Ecological Transformation of the Bukhara, Kashkadarya, and Samarkand Oases**

The Bukhara Oasis illustrates the interaction between historical cultural landscapes and environmental transformations. Its ecological conditions are strongly influenced by the Zarafshan River system, irrigation networks, soil salinity, and groundwater characteristics. Changes in water management and drainage conditions can directly influence the ecological state of the territories surrounding historical and religious monuments. The Kashkadarya Oasis is characterised by a combination of natural landscapes, agricultural territories, and numerous historical and religious sites. The

ecological attractiveness of its pilgrimage destinations depends on the preservation of vegetation, water sources, and the surrounding natural environment. The interaction between ecological and ethnic traditions is particularly important for understanding the historical continuity of sacred places [5]. The Samarkand Oasis provides another example of the importance of water infrastructure in the formation of cultural landscapes. Research by S. Mantellini, B. Rondelli, and S. Stride demonstrates that the development of the oasis was closely associated with a complex network of artificial irrigation channels. Their research also shows the importance of historical maps, satellite imagery, and aerial photographs in reconstructing changes in water landscapes over time [6]. These examples demonstrate that the ecological condition of pilgrimage destinations cannot be separated from the wider environmental processes occurring throughout the surrounding oasis.

## Methodological Approaches to Assessing Ecological Changes

The investigation of ecological changes in oasis shrines requires the application of several complementary research methods. The historical-geographical method helps reconstruct the original environmental conditions of pilgrimage sites and identify long-term changes in their landscapes. Comparative analysis makes it possible to examine differences between historical and contemporary ecological conditions. The landscape-ecological approach examines the relationship between relief, climate, water resources, soil, and vegetation. It allows researchers to determine the stability of natural complexes and identify areas exposed to environmental degradation. Remote sensing and geographic information system technologies can be used to analyse changes in vegetation cover, land use, water bodies, and built-up areas. Comparing satellite images from different periods provides an opportunity to identify the spatial distribution and intensity of environmental transformations. Field observations, soil sampling, water-quality assessment, and interviews with local communities can provide additional information about the ecological condition of pilgrimage sites. Combining these methods makes it possible to develop scientifically grounded recommendations for environmental protection and sustainable tourism management.

## Conclusion

The ecological characteristics of oasis shrines in Uzbekistan are determined by the interaction of climatic conditions, water resources, soil properties, vegetation, and historical human activities. These factors have shaped the natural and cultural landscapes in which many pilgrimage destinations developed. Contemporary environmental changes, including water scarcity, soil salinisation, vegetation

degradation, climate change, and increasing anthropogenic pressure, create challenges for the preservation of these unique locations.

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