



**FORMATION OF A FAVORABLE URBAN LANDSCAPE IN THE DRY HOT
CLIMATE OF SURKHANDARYA**

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Abstract

The article highlights the impact of arid climatic conditions on the development of urban landscapes in contemporary cities situated within the arid tropical zone. The responsibilities of landscape architecture encompass the establishment of a conducive environment within urban areas to enhance the physical well-being of individuals through the incorporation of designated green spaces and the provision of adequate watering systems in densely populated areas.

Keywords: Urban Planning, Landscape-Climatic Conditions, Subtropical Zone, Architectural And Landscape Urban Space, Tourism

Introduction

In the context of contemporary urban planning, the integration of landscape-climatic conditions, regional and national characteristics, as well as historical and cultural traditions into the planning and development of cities situated in dry and hot climate zones holds significant social importance. Modern scientific discourse refers to these climate zones as areas characterized by prolonged, hot summers (exceeding 100 days per year), high air temperatures that frequently reach or surpass 40°C, and average maximum temperatures in July of +30°C and above. The average relative humidity during July typically falls below 50-55%. This climatic profile is commonly found in countries situated in subtropical regions. (Kislov A.V 2022)

The rational architectural and landscape organization of urban territories in such climatic conditions can substantially enhance the microclimate's quality and improve the sanitary, hygienic, aesthetic, and functional characteristics of the urban space. Consequently, this positively impacts the well-being of residents and contributes to their physical and spiritual rejuvenation.

In the given context, the primary social and urban planning challenge in Uzbekistan pertains to the establishment of a well-balanced and harmoniously designed architectural and landscape urban space. This issue is of utmost significance as Uzbekistan is situated in the subtropical zone and experiences continuous expansion of modern urban developments (Abdullaeva, 2017).

Addressing the optimization of microclimates in urban settlements of Uzbekistan is intricately linked to the strategic direction of transforming tourism into a key driver of the country's development, aimed at fostering sustainable regional growth. Notably, in President Sh.M. Mirziyoyev's message, the development of the tourism sector in Uzbekistan's economy is underscored as one of the foremost objectives in social development (2022).

In order to attract investment in the tourism industry, it is crucial to prioritize the enhancement of the ecological aspect of the urban environment, particularly in areas housing Islamic shrines like the Surkhandarya region. This approach serves to captivate visitors to Uzbekistan, with the city of Termez being a notable example (Inagamkhodzhaev, 2021).

In recent times, cities located in the dry hot climate zone, including Termez, have witnessed the gradual emergence of a complex environmental imbalance stemming from the advancement of scientific, technical, and urban processes associated with globalization. This development has led to various challenges, such as the diminishment of "oases" within urban settings, the proliferation of densely packed residential structures, and the adverse technological impact on urban residents. Consequently, it becomes imperative to consider numerous factors in the development of urban landscapes, encompassing aspects such as natural elements, bioclimatic conditions, and environmental sustainability.

Consequently, it is evident that particular attention must be devoted to the ecological state of contemporary large urban settlements and megacities situated in specific natural conditions characterized by a hot and arid climate. Presently, there exists a global trend of population growth in urban centers boasting well-developed infrastructures. This demographic shift is accompanied by substantial and continuous transformations within the urban environment. (Matniyozov, Z., 2020)

Essentially, the areas of development requiring particular consideration encompass the following:

The intensification of urban space density.

The heightened burden of transportation on the urban environment.

The expansion of the scale and complexity of engineering structures and overall urban infrastructure.

The aforementioned developments are consequences of the accelerated process of territorial overpopulation. These changes exert an adverse impact on the microclimate of the region and disrupt the ecological equilibrium that has gradually formed over numerous years (Stepanova, E. M., 2019).

Empirical evidence demonstrates that humans possess the ability to adapt to various natural and climatic environments where they can procure sustenance. However, the environments in which their physical and mental performance can reach optimal levels are exceedingly limited.

Consequently, specialists are compelled to develop diverse approaches to regulate the conditions within urban environments, artificially creating favorable circumstances for human

activities. For instance, in the city of Termez, historical practices involved considering the detrimental impacts of elements such as wind, rain, and sunlight when constructing streets.

Regrettably, contemporary urban architectural construction predominantly neglects the advancements and methodologies derived from biological and other natural sciences that are pertinent to architectural and urban planning (Kochurov B.I., 2018).

Therefore, based on the aforementioned points, it can be deduced that in the context of scientific and technological advancements, intensified international communication, and growing public interest in the preservation of cultural heritage, novel principles in urban planning and urban landscape development are imperative.

▪ **Research Methodology:**

To explore the climate of Termez, an examination was conducted employing available data and research methodologies. This analysis aimed to ascertain the key climatic characteristics specific to Termez. Additionally, a comparative analysis was conducted to juxtapose the climate of Termez with that of other regions, thereby identifying similarities and disparities in climatic conditions and discerning factors that may influence Termez's climate.

In some instances, climate models and projections may have been utilized to analyze Termez's climate. This approach facilitated an assessment of potential future climate variations in the city, including alterations in temperature, precipitation patterns, and other relevant parameters. Moreover, it enabled an evaluation of the potential impact of these changes on the urban environment and society at large.

▪ **Findings and Analyses:**

In the context of constructing urban buildings within a dry and hot climate zone, certain principles should be given particular attention. These principles include:

Temperature Considerations: It is crucial to consider the temperature characteristics of the environment during the design phase. This entails implementing strategies to mitigate heat gain within the premises, especially during the hottest part of the day.

Effective Use of Shading Mechanisms: The practical utilization of shading devices that reduce the intensity of natural sunlight is of utmost importance. These mechanisms aid in minimizing the impact of bright light on the interior spaces.

Regulation of Building Ventilation: Adequate regulation of aeration within the buildings and modern structures is essential. This ensures a proper air exchange for sanitary and hygienic purposes while maintaining a comfortable indoor environment.

Furthermore, it is equally important to adhere to principles governing the overall formation of the interior, interior decoration, and premises' embellishment. By incorporating these principles into the design of buildings situated in hot and dry regions, it becomes possible to significantly decrease heat gain within the premises during scorching periods of the day. This, in turn, safeguards the interiors from sultry temperatures, sand-laden winds, and enables the maintenance of a suitable level of air exchange for sanitary purposes (Korkina E.V., 2019).

For instance, in Termez, a city situated in a subtropical inland climate, a prevalent practice is the implementation of a closed operating mode for premises. This approach effectively shields the internal spaces from the thermal radiation emitted by building surfaces and objects heated during the daytime. Lightweight multilayer panels with substantial thermal performance are commonly employed in the construction of facility walls.

However, open urban spaces in Termez remain inadequately protected against solar radiation and the influence of thermal air factors. To establish a more favorable urban environment in Termez, it is beneficial to draw upon the experiences of foreign countries facing similar climatic conditions.

One noteworthy experience worth considering is the transformation of urban landscapes with a focus on mitigating significant thermal effects, as exemplified by the capital city of Saudi Arabia, Riyadh. Given that Riyadh shares similar climatic conditions with Termez, exploring the strategies implemented in Riyadh can provide valuable insights for enhancing the urban environment in Termez (Weather Spark).

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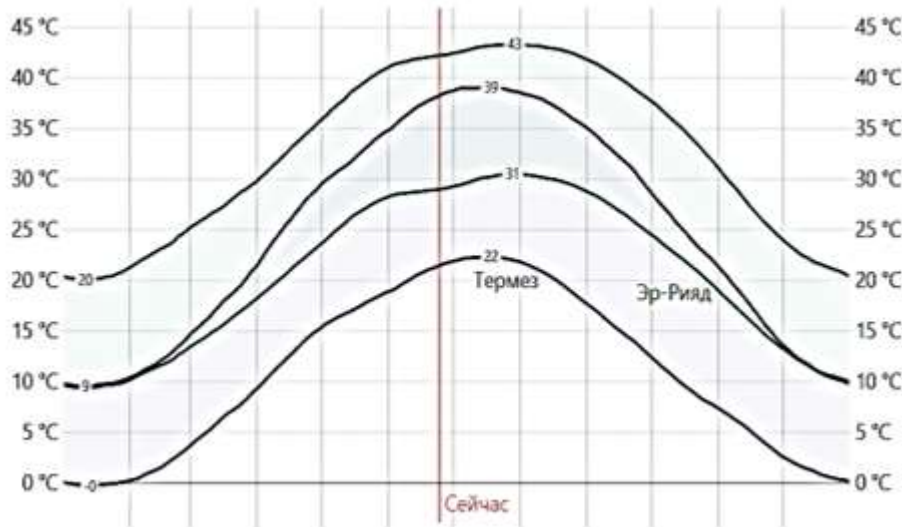


Fig.
Average
maximum

temperature. Riyadh and Termez.

The primary recreational area within Riyadh is situated in the city center, specifically the King Abdullah Park, which has been operational since 2013. Spanning an area of 318,000 square meters, this park boasts significant green spaces and lawns, occupying nearly half of its total territory.

In an arid climate zone, the zone designated for widespread recreation achieves landscape diversity through the simulation of moving water. This is accomplished through the implementation of a dry stream, a carefully arranged composition that mimics the flow of water, accomplished by the strategic placement of pebbles, boulders, large crushed stones, and rocks.

This particular element of landscape design draws inspiration from Japanese stone gardens and has gained considerable popularity in numerous parks across different countries in recent years.

In general, the park area within the city of Riyadh encompasses multiple gardens, areas designated for children and families, sports facilities, pedestrian pathways, and a restaurant spanning an area of 1.7 square meters. However, the highlight of the park is a sizable artificial reservoir that functions as a genuine lake, featuring a "dancing" fountain with laser illumination. Additionally, the park houses a summer theater where various cultural events of the capital city are held (Dolgova E. A, 2019).

The creation of King Abdullah Park was guided by several fundamental principles. These include the incorporation of artificial reservoirs within the park grounds, the predominance of drought-resistant plant species in the landscaping, the utilization of specialized technologies for the establishment and maintenance of plantings, and the thematic focus of the overall composition.

An assessment of the principal advantages of the recreational area in Riyadh reveals that the key design trends can be confidently applied in the area of Termez.

The analysis of the provided data reveals that during the summer season, the average maximum air temperature in the capital city of Saudi Arabia exceeds that of Termez by 4°C. Consequently, the microclimatic impact within the surrounding urban environment from the formation of the park area in Termez is expected to be more significant compared to Riyadh.

Fascinating concepts can be directly associated with the presence of a natural river flow, which plays a crucial role in effectively moisturizing the environment when combined with green barriers and lawns. In the case of Termez, this river is the Surkhandarya River, which runs alongside the city.

By strategically incorporating green spaces, it is possible to minimize solar radiation exposure on walls while simultaneously maintaining optimal conditions for ventilation (Giyasov A., 2018). This approach holds particular significance in densely developed areas, which are characteristic of many cities worldwide. The continuous increase in building heights and reduced visual distance between structures limits the opportunities for individuals to connect with the natural landscape.

Simultaneously, the practice of landscaping courtyards faces several challenges. (Dotsenko E.S. 2016) These challenges include the limited availability of space for planting trees and ornamental shrubs, the significant presence of engineering infrastructure required to ensure housing comfort, and the necessity of allocating areas for parking and other economic activities, such as waste management.

Vertical gardening presents an effective solution to address these aforementioned problems. In addition to its primary function of enhancing air quality, vertical gardening serves multiple purposes. It mitigates the extent of dust penetration, diminishes noise levels, and humidifies the urban atmosphere.

Consequently, the adoption of vertical gardening as a solution offers a means to overcome these challenges within the urban landscape. By integrating vertical gardening practices, it becomes possible to optimize air quality, reduce dust infiltration, attenuate noise levels, and increase humidity in the urban environment.

Therefore, employing foreign expertise to establish favorable conditions in the urban landscape, as illustrated by the city of Termez, exemplifies the most viable approach to integrating urban planning strategies and artificial regulation of the microclimate in urban areas. This approach enables a substantial optimization of the thermal characteristics within the urban environment, particularly in the arid and hot climate of Surkhandarya.

▪ **Conclusion**

In summary, the following conclusions can be drawn based on the aforementioned information:

1. Many residents in subtropical regions inhabit hot and calm climates. The combination of dense population, high urban development density, increased vehicular traffic, and industrial activities disrupts the ecological balance of the urban environment. Consequently, larger cities tend to have less favorable living conditions.

2. The landscape plays a crucial role in creating a favorable microenvironment within urban settlements. Scientific studies indicate that the presence of local thermal winds significantly improves the microclimate in urban areas characterized by high-rise buildings.

3. The formation of inclined airflows is facilitated by temperature disparities between building surfaces and road surfaces. These disparities are created through the integration of open spaces with shaded areas that are protected from direct solar radiation. Green spaces within urban environments serve a multifunctional role and can contribute to cooling the walls of buildings.

Overall, these findings highlight the importance of considering landscape design and green spaces in urban planning to enhance the microclimate and living conditions within urban areas.

4. The promotion of wind flow formation involves strategically placing tall structures and forested areas with extensive canopies. By considering these factors, it becomes feasible to develop models for aerodynamic design that can be effectively applied in contemporary cities situated in hot and calm climates.

5. The implementation of geoplasic principles, as exemplified by Termez in Uzbekistan, showcases the practical potential for enhancing the urban microclimate. Through the execution of park development projects, which incorporate an artificial reservoir and man-made topographical features, specific conditions are created to enhance air circulation within the urban space.

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