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LANDSCAPE STRATEGIES IN A HOT CLIMATE TO PROMOTE PHYSICAL ACTIVITY (CASE OF UZBEKISTAN)

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Abstract:
In the context of Uzbekistan's extremely hot and arid climate, the creation of comfortable urban environments that encourage physical activity presents a pressing urban planning challenge. This article aims to identify landscape design strategies that mitigate heat stress and enhance thermal comfort in public spaces. The study includes an analysis of the region's climatic conditions and outlines effective landscape interventions that increase the attractiveness and functionality of urban areas for everyday physical activity. Special attention is given to the adaptation of international best practices to Uzbekistan's climatic and socio-cultural context.

Keywords: landscape architecture, hot climate, physical activity, urban environment, microclimate, Uzbekistan, sustainable design.

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Introduction

Increasing physical activity among the population is considered one of the strategic goals of sustainable urban development. However, climatic conditions can significantly limit the accessibility and functionality of open public spaces. This issue becomes particularly relevant in hot climates, where intense solar radiation, overheating of surfaces, and lack of shade create barriers to outdoor activities, especially during daylight hours.

Uzbekistan is characterized by a sharply continental climate, with high summer temperatures and low annual precipitation. This necessitates the implementation of special design approaches aimed at improving the microclimatic characteristics of the urban environment. The present study focuses on identifying landscape strategies that encourage physical activity in open public spaces under increased thermal stress.

Climatic Characteristics of the Study Area

Uzbekistan's territory features a sharply continental climate with pronounced seasonal temperature fluctuations. Summer months are marked by persistently high air temperatures (the average for July is +35 °C, peaking up to +45 °C). Annual precipitation is low (200–400 mm), occurring mostly in autumn and winter. Relative humidity in summer drops below 30%, while solar radiation remains intense, causing the overheating of surfaces and a decline in outdoor thermal comfort.

Climatic constraints for physical activity in open spaces include:

- Overheating of surfaces (pavements, equipment, urban furniture),
- Insufficient protection from direct sunlight,
- Limited comfortable time outdoors (usually early morning or evening),
- Increased risk of heat stress, especially for vulnerable groups.

Landscape Strategies for Adapting Spaces to Hot Climates

Designing environments that support physical activity in hot climates requires adaptive landscape solutions. The following are key design approaches for creating comfortable and attractive public spaces:

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Providing Shade

Shade is essential in high-temperature environments. Effective methods include:

- Planting dense-canopy trees (e.g., Platanus orientalis, honey locust, ash-leaved maple),
- Installing pergolas, tensile canopies, and lightweight shade structures,
- Creating continuous shaded corridors with green infrastructure.

Integrating Water Features

Water not only serves an aesthetic purpose but also helps regulate microclimates:

- Fountains, cascades, and misting systems contribute to localized air cooling,
- The sound and visual effect of water improve psychological comfort and enhance spatial appeal.

Using Low-Heat Surfaces

Materials with low thermal conductivity and high reflectivity (e.g., light terrazzo, porous concrete, natural stone) help reduce surface overheating. Dark pavements and asphalt should be avoided in active-use zones.

Vertical and Multilevel Greening

Complex green systems provide both shade and air humidification:

- Vertical greening (green walls, trellises),
- Multilayer planting compositions (trees, shrubs, groundcovers),
- Use of drought-resistant native species that require minimal irrigation.

Organizing Evening and Nighttime Activities

In hot climates, evenings and nights become primary times for using public spaces:

- Design of functional and decorative lighting systems,
- Ensuring safety, visibility, and visual comfort,
- Planning routes and events to encourage nighttime physical activity.

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Analysis of Local and International Experience

International Practices:

- In Gulf cities (Dubai, Abu Dhabi), smart shading systems, misting technologies, and automated climate control are widely used in public areas.
- In southern Spain (e.g., Seville), traditional cooling elements are integrated: pergolas, fabric awnings, water canals, and shaded arcades.
- In Israel, urban boulevards often feature continuous shading and mist lines along cycling routes.

Uzbekistan:

- In Tashkent, recent park and boulevard renovations include shaded areas and bicycle infrastructure.
- However, many newly developed districts still lack sufficient shading structures, water elements, and comprehensive green systems.
- There is a pressing need to shift from decorative greening toward functionally and climatically adaptive landscape strategies.

Central Park (Babur) Tashkent

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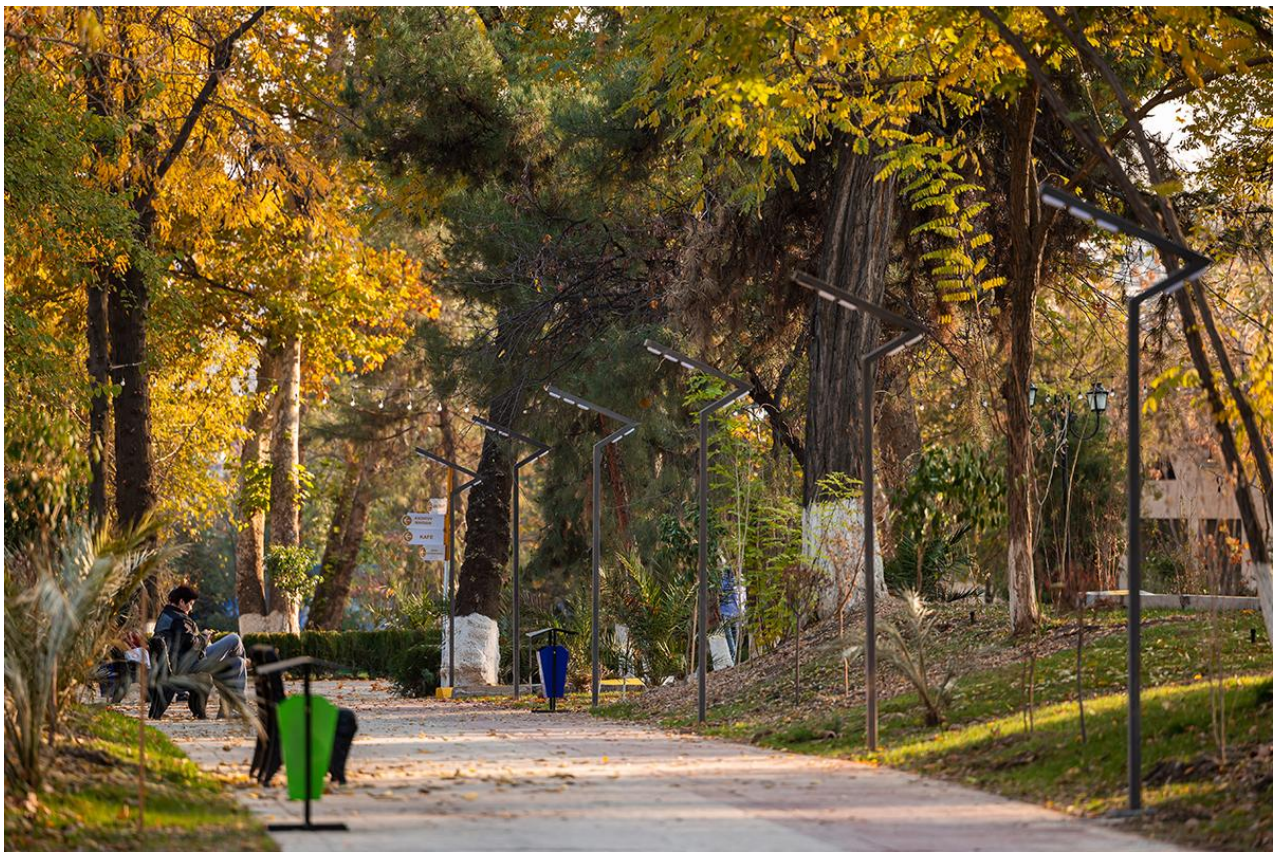

Central Park (Babur) Tashkent

Conclusion and Recommendations

Creating an urban environment that promotes physical activity in hot climates requires the integration of climate-adaptive landscape strategies focused on:

- Reducing thermal stress,
- Enhancing sensory and aesthetic quality,
- Expanding the duration of outdoor comfort,
- Ensuring ecological sustainability and cost-effectiveness.

It is recommended to develop specific guidelines for the design of green and recreational areas in hot regions, considering local plant species, cultural practices, and behavioral scenarios of users.

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