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DESIGN CHALLENGES FOR HEALTH AND WELLNESS CENTRES IN RECREATIONAL AREAS AND APPROACHES TO ADDRESSING THEM

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Abstract. Designing health and wellness centres in recreational areas requires coordinated consideration of architectural and planning, functional, environmental, and engineering factors. This article examines inadequate assessment of site-specific climatic and natural conditions, inefficient functional zoning, fragmented landscape organization, weaknesses in planting systems, and inefficient use of water and energy. It outlines spatial strategies for mitigating these challenges and discusses the role of pre-design analysis, integrated functional planning, landscape conservation, water-saving technologies, and inclusive environments that serve users with different needs.

Keywords: recreational areas, health and wellness centres, design, architectural planning, landscape architecture, functional zoning, environmental sustainability, green infrastructure, local climate, universal access.

Аннотация. Проектирование оздоровительных центров на рекреационных территориях требует согласованного учёта архитектурно-планировочных, функциональных, экологических и инженерно-технических факторов. В статье рассматриваются недостаточный учёт природно-климатических характеристик участка, нерациональное размещение функциональных зон, отсутствие целостной организации ландшафтной среды, недостатки системы озеленения и неэффективное использование водных и энергетических ресурсов. Систематизированы пространственные решения, направленные на снижение этих проблем; обоснована роль предпроектного анализа, взаимосвязанного функционального планирования, сохранения природного ландшафта, водосберегающих технологий и создания доступной среды для различных групп пользователей.

Ключевые слова: рекреационные территории, оздоровительные центры, проектирование, архитектурно-планировочные решения, ландшафтная архитектура, функциональное зонирование, экологическая устойчивость, зелёная инфраструктура, природно-климатические условия, универсальная доступность.

Introduction

Creating a supportive environment that helps protect and improve public health is a key concern in contemporary architecture and urban planning. Rapid urbanization, changing lifestyles, mounting environmental pressures, and growing demand for high-quality leisure make the development of recreational areas increasingly necessary. Designing a health and wellness centre in such a setting involves more than placing buildings on a site: climate, landscape, ecological conditions, and social needs must be considered as parts of one system. Careful use of topography, existing vegetation, water resources, solar exposure, and natural ventilation can create an environment that supports physical activity and psychological restoration.

Common design problems include insufficient study of site conditions, poorly located functional zones, weak connections between buildings and landscape, fragmented planting, and excessive consumption of water and energy. In some projects, attention is concentrated on building placement, while open spaces, walking routes, and quiet areas for rest receive less consideration.

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This article aims to organize the main challenges involved in designing health and wellness centres in recreational areas and to describe architectural and spatial approaches that can help address them. Functional convenience, environmental sustainability, and access for users with different needs are treated as interrelated criteria.

Main discussion

Relationship between site conditions and architectural planning. A central challenge is the limited adaptation of the design to the natural characteristics of the site. Each location has its own topography, soils, vegetation, hydrology, prevailing winds, and solar exposure. Overlooking these factors can weaken planning performance, complicate construction, and increase operating costs. Orienting principal rooms appropriately, assessing natural ventilation, and providing solar protection can reduce summer overheating and reliance on mechanical cooling [2, 3].

Functional zoning and connections. A health and wellness centre may include buildings and outdoor areas for treatment and prevention, physical activity, administration, social functions, and recreation [1]. If these uses are not coordinated, visitor flows may intersect, noise may increase, and some spaces may become less convenient to use. Sports areas and group activities should therefore be separated from quiet recreation, psychological restoration, and treatment areas while remaining connected by clear, comfortable pedestrian routes. Service vehicle access should also be safely separated from the primary recreational spaces [6].

Weaknesses in landscape organization. The landscape shapes the centre's visual character, microclimate, and user experience. When planting is treated only as decoration, green areas become disconnected and fail to form a coherent recreational network. A layered combination of trees, shrubs, lawns, and ground-cover plants can provide shade, wind protection, and spatial continuity. Plant selection should account for local soil and climate, drought tolerance, water demand, maintenance requirements, and allergenic properties [2, 3].

Walking routes should connect buildings, sports areas, water features, and places to rest. Their alignment should respond to the topography and landscape structure while providing legible and safe access for people with different physical abilities. Slip-resistant surfaces, compliant gradients, step-free routes, and seating improve usability. Landscape proposals should also draw on research linking natural environments in healthcare settings with access, safety, and therapeutic objectives [5, 6].

Environmental and engineering challenges. Water scarcity and rising temperatures make efficient irrigation essential. Conventional watering that ignores plant requirements and soil conditions can waste water and increase surface runoff. Drip irrigation, automated controls, and soil-moisture sensors allow watering to respond to weather and plant condition. Subject to technical and sanitary requirements, rainwater harvesting and the use of treated wastewater for non-potable purposes may also be considered; these systems should be planned from the outset [4].

Insufficient use of natural microclimatic conditions can raise operating costs. Natural ventilation, solar-shading devices, shaded walkways, energy-efficient materials, and green roofs and façades can reduce building heat loads [3, 5]. Drainage for rain and snowmelt should be adapted to the site's topography and soil. Poorly designed drainage can lead to ponding, waterlogged soil, and damage to landscape elements. Where technically feasible, design should provide for the capture and reuse of runoff as well as its safe discharge.

Architectural and spatial approaches to the identified challenges. The first step is a comprehensive pre-design assessment of topography, vegetation, soil and hydrological conditions, solar exposure, wind, transport access, and pedestrian movement. This evidence supports reasoned decisions about the placement of buildings and outdoor areas. The next step is to develop an integrated functional plan that accounts for the interaction of active and quiet zones, safe circulation, and service requirements [2, 7].

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Retaining existing trees, minimizing changes to natural topography, integrating water features into the landscape, and providing shaded spaces help preserve the site's natural potential. Universal access means that entrances, paths, rest areas, and sanitary facilities are convenient for people of different ages and physical abilities. Step-free routes, safe surfaces, compliant gradients, and places for short breaks should be incorporated from the beginning of the design process [6, 7]. Architecture, landscape design, engineering infrastructure, and environmental requirements should therefore be developed as one coordinated system.

Conclusion

Designing health and wellness centres in recreational areas requires the integrated resolution of functional, architectural-planning, environmental, and engineering challenges. Quality depends not only on the buildings themselves but also on landscape organization, the convenience of pedestrian connections, responsible use of natural resources, and access for all visitors.

Addressing these challenges requires thorough pre-design analysis, coordinated functional zoning, conservation of natural features, planting suited to local conditions, and water-efficient engineering. Treating the landscape not as a separate layer of site improvement but as an integrated spatial system linking buildings, nature, and human activity can improve both environmental performance and the quality of use.

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