

ARCHITECTURAL AND ENVIRONMENTAL DESIGN PRINCIPLES OF WATER ENTERTAINMENT AND HEALTH CENTERS IN HOT CLIMATE REGIONS

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Najib Ibragimov

PhD (Architecture)

*Samarkand state university of architecture and construction named after Mirzo
Ulugbek, Republic of Uzbekistan*

ORCID ID: <https://orcid.org/0009-0009-6315-6620>

ibragimov.najib@samdaqu.edu.uz

Ixtiyor Axmedov

(stajor o'qituvchi)

*Samarkand state university of architecture and construction named after Mirzo
Ulugbek, Republic of Uzbekistan*

ORCID ID: <https://orcid.org/0009-0006-9113-7468>

axmedov.ixtiyor@samdaqu.edu.uz

Abstract

This article explores the architectural formation and environmental design principles of water entertainment and health centers as multifunctional recreational complexes, with a particular focus on hot and arid climate regions. The relevance of the study is обусловлена the increasing demand for modern leisure infrastructure and the absence of unified regulatory and design approaches for aquatic facilities in developing countries, including Uzbekistan.

The aim of the research is to develop a comprehensive typological classification and to identify key architectural and environmental design principles for water entertainment centers based on climatic, urban, and functional factors.

The research methodology includes comparative analysis of international and local design practices, field surveys of water recreational facilities in major cities of Uzbekistan, and the study of regulatory and scientific literature.

The results of the study present an improved classification system of water complexes based on structural, spatial, and functional characteristics. In addition, key factors influencing architectural formation—such as climatic adaptation, environmental integration, and engineering systems—are identified and systematized.

The scientific novelty lies in integrating environmental design strategies with typological classification, enabling more efficient, sustainable, and context-sensitive planning of water entertainment facilities.

Keywords

water park, aquatic center, recreational architecture, sustainable design, climate adaptation, urban environment, typology, environmental design

Introduction and relevance of research. The development of recreational infrastructure is one of the key priorities in improving the quality of life and public health. Water entertainment and health centers (water parks) represent a rapidly growing segment of leisure architecture, combining elements of sports, recreation, and cultural activity.

Despite the widespread construction of such facilities worldwide, their design often lacks a unified scientific and methodological basis. In particular, insufficient attention is paid to climatic conditions, environmental integration, and urban context.

In Uzbekistan, the situation is further complicated by the absence of clear regulatory frameworks and specialized design standards for water entertainment complexes. This leads to inefficiencies in operation, increased energy consumption, and reduced environmental compatibility.

Caring for the health of the population is one of the main social tasks of our state and is constantly in the focus of attention of the President of the Republic and the government.

Analysis of the basic term “water park” reveals diversity and inconsistencies in the formulations used: such concepts as “water park”, “swimming pool”, “aquatic complex”, “aquatic center” and “aquatic facility” do not have a clear differentiation [1].

There are already more than a thousand structures called water parks in the world. Despite the fact that most facilities are equipped with a wide range of technological equipment and have a developed infrastructure, they are all built according to “empirically” developed rules, which subsequently leads to a number of problems associated with their creation and operation:

- today there are very few successful examples of environmental formation and operation of water parks taking into account local natural and climatic conditions;

- when implementing water and recreational health centers, insufficient attention is paid to the conditions of perception of the object in the structure of the spatial environment;

- in Uzbekistan there is no proper control over the process of creating water-entertainment health centers (water parks) and its regulation by government agencies, there are no generally accepted standards for their construction and operating rules;

- there is a lack of specialized specialists in aquatic objects who fully represent the problems of the topic.

“Water park” is a special type of sports and entertainment complexes with a dominant component of active leisure on the water, requiring a direct visual and functional connection with the natural environment; architecturally solved as an “environmental object”, the appearance of which is made up of typological elements that determine direct interaction with the external space and are combined into a structural system. Consequently, the specifics of constructing these structures, first of all, depend on the environmental factors of the external environment and on the requirements for the internal one, which has individual microclimatic parameters (Figure 1).

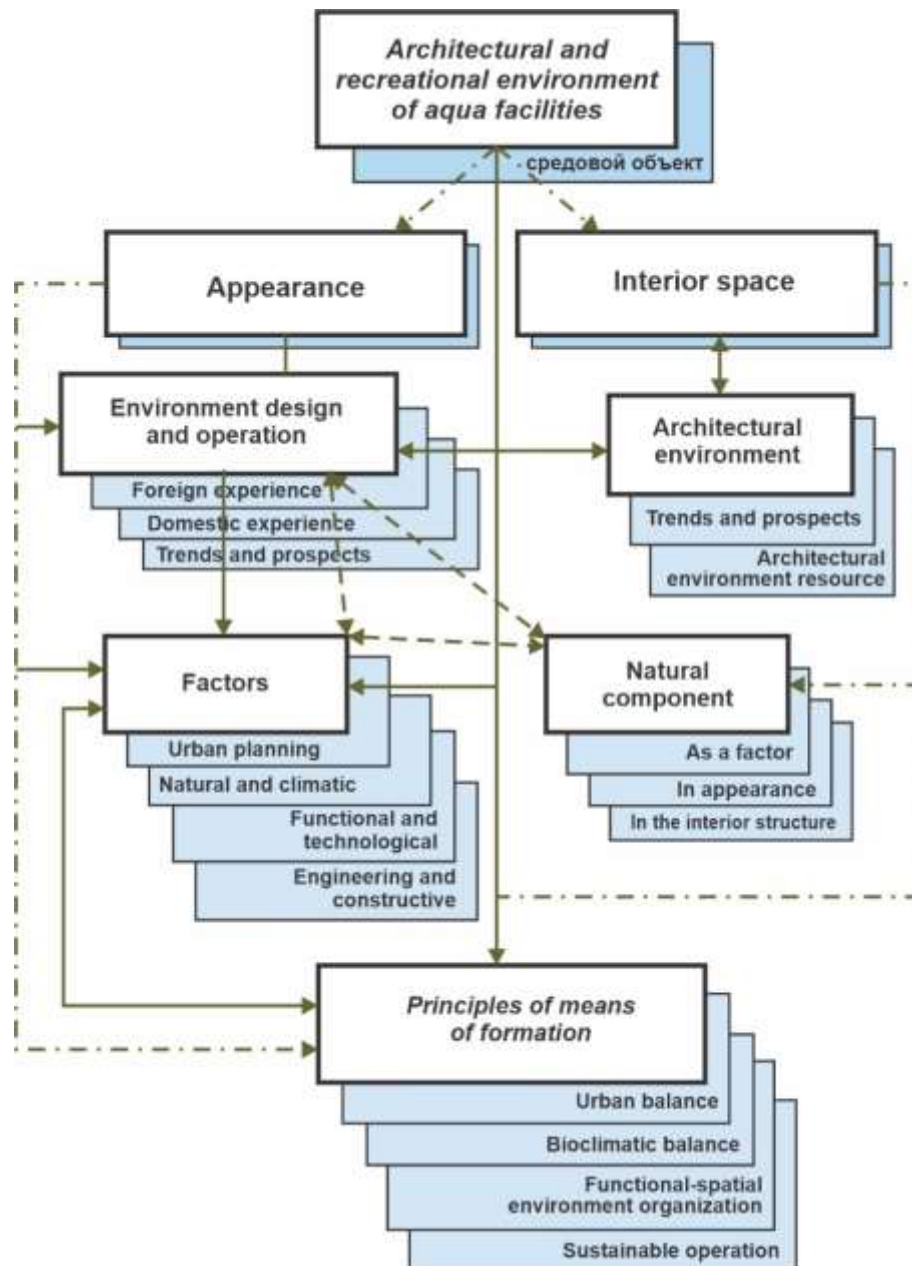


Figure 1. Model of environment formation of aquatic objects.

Object and methodology of research. The following types of buildings and structures are considered in this work:

- outdoor and indoor swimming pools, artificial wave pools, pool complexes for recreation and entertainment, water complexes for mass active recreation and sports;
- bathhouse – health complexes;

Research methodology is determined by the purpose and objectives of the study, includes the study of domestic and foreign literary sources, design and regulatory and instructional materials, field surveys of more than 10 water and entertainment centers in the cities of Tashkent, Samarkand, Navoi, etc., as well as the use of the comparative analysis method.

The pool acts as an integral component of all water structures and can be considered as a proven analogue of structural, technical and engineering solutions.

Based on the buildings of sports swimming pools, a regulatory and legal framework for leisure aquatic centers is being created.

Classification of water parks. Typological classification according to main characteristics [1].

By type of structure, there are: open (seasonal), closed (year-round) and combined entertainment water complexes (RVC), which are a universal solution for combining the first two types. It should be noted that it is quite difficult to define a clear line between indoor and combined water parks.

Based on their location relative to the urban structure, water complexes are divided into urban, peripheral, suburban and located at a considerable distance from the city.

By size: “mini-water parks” with an area from 500 to 1500 m², “medium” - buildings occupying from two hectares of territory, “large” - water parks of combined or open types with a total area of 15 to 30 thousand m² and RVC over 30 thousand m² - “giant”.

In terms of interaction with the surrounding buildings: built-in and attached (mini-water parks), independent objects and those created as part of a larger multifunctional leisure center.

According to functional zoning: the water park itself, a water complex and an aqua entertainment facility as part of a structure with a related function.

Based on the range of additional services provided in the water park, preference is given to a specific function: entertainment, cultural leisure, health improvement, sports. Water centers with a priority of equal functionality are also possible, when each component is assigned an autonomous zone of equal planning and social significance.

According to the environmental filling of the aqua zone with a predominance in the compositional solution of the internal space of the water park: play equipment, landscaping, or small architectural forms that act as artistic accents and enrich the impression of the “basic” compositional frame.

Research results. A comparison of the work of various types of entertainment water complexes showed that the discrepancy lies precisely in the climatic characteristics of the area where they are located: the load of indoor facilities is relatively uniform throughout the year; The use of open seasonal periods of lowering the average daily temperature is not practiced.

In this regard, it seems most appropriate for our country to create water park complexes in the form of closed and open buildings. Strict regulation and stability

of operating modes of the latter make it possible to create optimal operating conditions that meet the interests of all consumer groups, which is the key to high profitability.

Discussion and conclusion of the studies. 1. As a result of a comparative analysis of existing aquatic facilities, it was determined that the most effective (from an economic and aesthetic point of view) is a ventilated curtain façade, both as blank or glazed sections of walls, and as a roof covering.

2. In aquatic facilities, hydraulics and water treatment are added to the standard set of systems necessary to maintain the operating condition of leisure centers.

3. The given architectural and recreational typology of water parks as environmental objects performs several functions: describes their structure, defines a list of tasks in the design process, illustrating possible solutions, and most importantly, suggests the most appropriate direction in working with a specific type of environment.

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