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Research Article

EVALUATION OF ÇANAKKALE ÖZGÜRLÜK PARK IN TERMS OF BIOPHILIC DESIGN PRINCIPLES

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ABSTRACT. There is an inherent bond between humans and nature. This bond, how-ever, has weakened over time due to factors such as population growth and increase in development. The weakening of humankind's connection with nature leads to physical and mental health problems because nature heals the soul, reduces stress, creates a therapeutic effect on the physical being, and brings many benefits. The importance of our relationship with nature has become more evident with the rise of urbanization. To meet this need, design approaches that act as a bridge between city and nature have been developed. One of these approaches is the concept of biophilia. Biophilia meets the human need for connection and interaction with nature.In this study, the concept of biophilia and its design principles are examined. Within the scope of the study, Özgürlük Park in the Esenler District of Çanakkale province was evaluated based on fourteen biophilic design principles. The assessment questioned how well the current state of the park aligns with biophilic design principles. As a result of the study, it was found that there are shortcomings in plant design, limited sensory stimuli, and insufficient use of natural materials, and the principles were evaluated accordingly. Design recommendations were developed from a landscape architectural perspective.

Keywords: *biophilia; nature-based design; non-visual connection; urban green space*

INTRODUCTION

According to the concept of biophilia, there is an instinctive bond between humans and nature. However, with population growth, advancing technology, and accelerated industrialization, migration from rural to urban areas has intensified. As urbanization surged to meet this growing demand, cities rapidly became more concrete, disrupting the relationship between humans and nature. To restore this bond, nature-based design and planning approaches have been developed, one of which is the concept of biophilia. This concept argues that humans have an emotional need for a connection with nature.

The rapidly growing and increasing urbanization have almost become like an avalanche, causing significant issues. As a result, these challenges have become major criteria in planning projects, indicating that, while society has distanced itself from nature, efforts are underway to reintroduce it into our lives. New ideas aim to foster human affinity for nature, intending to fundamentally change humanity's struggle with the natural world. Concepts like ecological architecture and biomimesis have emerged from these approaches by Şenozan [1].

NATURE-BASED DESIGN CONCEPTS

Şenozan [1] defines nature-based design concepts as follows:

- *Organic Architecture:* This approach aims to create designs that integrate with nature to fulfill human spatial needs, supporting and enhancing the human-nature relationship. An example of this approach is Casa Mila, designed by renowned architect Gaudi, showcasing masterful integration of natural elements into the building structure.
- *Green Design:* This design approach minimizes the impact of the built environment on human health and the surrounding environment, supporting the human-nature relationship while maintaining a balance between benefits and drawbacks.
- *Ecological Design:* Ecological design supports an environmental approach across various fields, aiming to integrate nature into all areas of design. The Mauritius Eco Villa by Foster and Partners is an impressive example of this approach.
- *Biomimicry:* This approach observes, interprets, and draws inspiration from nature and natural processes for its designs. In other words, it mimics nature, integrating elements into design. The Lotus Temple, designed by Iranian architect Fariborz Sahba, exemplifies biomimicry.
- *Regenerative Design:* This approach seeks to create a better environment by making improvements based on existing buildings and human behaviors, essentially "patching" nature onto urban spaces.
- *Biophilic Design:* This approach focuses on the emotional aspect of humans' need to connect and bond with nature. One of the best examples is the Selgas Cano office in Spain, where a fully glass office was built within a forest with minimal environmental impact, allowing employees to feel immersed in nature, enhancing happiness and productivity.

The Concept of Biophilia

The word "biophilia" means "love of life." Coined in the 1960s, this concept was introduced by psychologist Erich Fromm, who associated it with emotions. In his book *The Heart of Man*, Fromm mentioned biophilia for the first time, and about twenty years later, biologist and environmentalist Edward Wilson popularized it. Wilson described biophilia as "an innate attraction of humans to other forms, a bond awakened by life circumstances, a fascination intertwined with pleasure, a sense of security, awe, and even disgust" İrfanoğlu & Suri [2].

In the 19th century, the "garden city" concept emerged as a critique of the issues arising from concrete, polluted industrial cities and humans' growing detachment from nature. Today, it has resurfaced in the form of biophilic design with the "city within a garden" approach. The concept of biophilia officially entered literature in 1964, focusing on humans' emotional and physical need for nature, given that nature is fundamental to human existence. The goal of the biophilic approach is to reconnect users with nature within built environments by Öztürk [3]. Thus, even with increasing urbanization and industrialization, people can find a way to connect with their natural roots.

Integrating the biophilic approach into design effectively can be summarized in five key principles by Ünal [4]:

1. It requires a sustainable and renewable balance with nature.
2. It emphasizes the positive contribution of nature to human health and vitality, as nature offers comfort, boosts happiness, and reduces stress.

3. It encourages emotional adaptation to spaces, fostering a sense of belonging and security.
4. It supports fulfilling human responsibilities toward nature by strengthening mutual bonds.
5. It aims to develop robust, interconnected architectural solutions that complement each other like pieces of a puzzle.

Biophilic Design in Landscape Architecture

At first glance, biophilic design may appear to be the realm of interior designers, as they attempt to confine the lost human-nature connection within four walls. However, landscape architects are more advantageously positioned to apply biophilic design due to their flexibility in working with plant-based materials and broader solution options. These advantages are described in the article of Clancy & Ryan [5] as real (representational) nature, perceptual fluidity, and complex adaptive systems. The reason that landscape architects' scope of work in biophilic design is not as restricted as in other architectural fields is because they work with living materials, such as plants, and have more solution options for limiting factors in their designs. Unlike creating artificial nature indoors, landscape architects achieve more effective and healthier results by incorporating real nature, topography, and vegetation elements into their designs by Gökten & Kelkit [6].

Examples of Biophilic Design in Turkey

At Istanbul Technical University (ITU), a project was developed on the Ayazağa Campus, combining climate change and green infrastructure issues with a biophilic design approach. The project proposed solutions for "effective water management" in pedestrian areas, creating a biological channel with systems that capture rainwater and rain trenches. This initiative aimed to strengthen human-nature relationships while highlighting climate change and increasing the campus's green space by Gökten & Kelkit [6].

Another example is the Piyalepaşa Outdoor Living Space, which is one of Turkey's first biophilic outdoor projects, designed and implemented by an architectural studio team in İstanbul (Figure 1). The project transformed two concrete structures connecting three residential areas into a biophilic outdoor living space, incorporating biophilic design principles such as "nature in space," "space's nature," and "natural reminders" by Dalay [7].

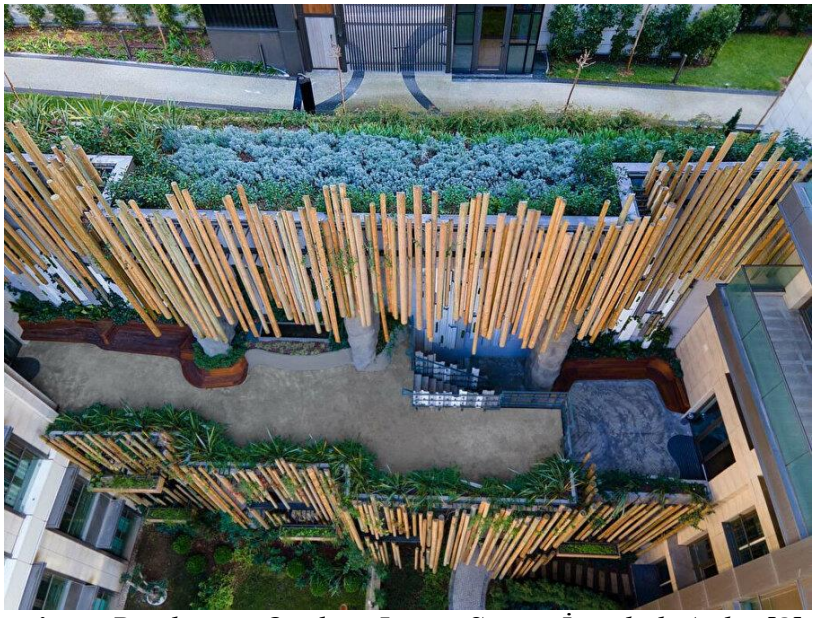


Fig. 1. *Piyalepaşa Outdoor Living Space, İstanbul, Aydın [8]*

Examples of Biophilic Design from Abroad

In cities where concrete construction is at its peak, providing open green spaces, playgrounds, and areas for activities like festivals and concerts is essential for people to escape from concrete surroundings and connect with nature. Strengthening the bond between humans and nature allows people to benefit from the healing effects nature offers. One of the best examples of this approach is the Rio Park project surrounding the Manzanares River in Madrid by Gökten & Kelkit [6].

Another example is the Vertical Gardens designed in Brisbane, Australia (Figure 2). This residential structure is designed to create both shade and natural thermal, as well as solar insulation through vertical garden balconies by Cowan [9].



Fig. 2. *The Vertical Gardens Design in Brisbane, Australia by Cowan [9]*

MATERIALS AND METHOD

This study was conducted using the case study of Özgürlük Park located in the city center of Çanakkale (Figure 3). The study area was opened to the public in 2012 and spans 57 acres. Current facilities include bicycle paths, walking paths, sports equipment, children's play areas, food and beverage areas, a ceramics workshop, a dog-walking park, and open green areas for various events. Additional materials used in this study were, national and international literature, on-site observations, and site photographs.



Fig. 3. *Location of Özgürlük Park*

The study method involves several steps of reviewing the national and international literature on biophilic design principles, gathering information, documents, maps, and similar resources related to the study area, conducting on-site observations, analyzing all collected data, and developing recommendations for the study area.

This study examines Çanakkale Özgürlük Park in terms of biophilic design principles. The biophilic design criteria for the study were based on several sources: "Ankara İmrahor Vadisi ve İncesu Deresinin Biyofilik Tasarım Yaklaşımı İçinde Değerlendirilmesi" by Gökten & Kelkit [5], "Kent Parklarının Biyofilik Tasarım Kriterlerine Göre Yenilenmesi: İskenderun Millet Parkı Örneği" by Ökten [10], and "Biophilic Design Patterns: Emerging Nature-Based Parameters for Health and Well-Being in the Built Environment" by Ryan et al. [11]. The biophilic design principles are summarized under Table 1.

Table 1. *Biophilic Design Principles*

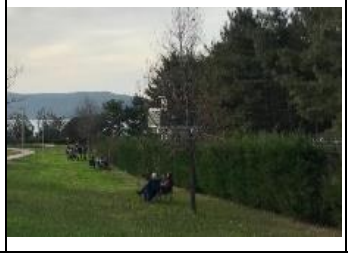
Nature in the Space	1. Visual connection with nature 2. Non-visual connection with nature 3. Non-rhythmic sensory stimuli 4. Access to thermal and airflow variability 5. Presence of water 6. Dynamic and diffuse light 7. Connection with natural systems
Natural Analogues	8. Biomorphic forms and patterns 9. Material connection with nature 10. Complexity and order
Nature of the Space	11. Prospect 12. Refuge 13. Mystery

FINDINGS

There has been no noticeable structural increase or change in the park since its establishment in 2012. When viewed through the lens of biophilic design, it is evident that natural processes continue in Özgürlük Park. Some elements within the park area, however, contradict the principles of biophilic design. An evaluation of Çanakkale Özgürlük Park in terms of biophilic design principles is provided in Table 2.

Table 2. *Evaluation of Çanakkale Özgürlük Park in Terms of Biophilic Design Principles*

Design Parameter	Visual	Evaluation
Visual connection with nature		• In line with this principle, the interest of nature and conservation should be prioritized. • The area is located on one of the highest points of the Esenler neighborhood, offering a dominant view of the Bosphorus. • According to this principle, emphasis is placed on biodiversity. To emulate nature, species such as Pine, Cedar, Crape Myrtle, Acacia, Myrtle, Cypress, Wisteria, and Rose have been used. Combining evergreen plants with calligraphic plants to create a visual connection with nature. • Around the exercise areas, both evergreen and deciduous plants are used together. This integration helps establish a natural connection for the spaces for exercise.
Non-visual connection with nature		• Sensory stimuli are quite limited in the area, which restricts the fulfillment of this parameter. • As aromatic plants, only Wisteria and Rose have been used, and their presence is minimal across the site. • Since no water element is included, there is no auditory stimulus from water. Wind, however, serves as a natural sensory element. • No texture-stimulating elements have been used to engage the sense of touch. • Bird and dog sounds can be noted as auditory stimuli. • A Plum tree has been included to engage the sense of taste.

Non-rhythmic sensory stimuli		• This parameter has been addressed through plant diversity. Recreational areas and the plant transition zones between these areas help establish a connection with nature. • Auditory elements of nature are present in the area. The circulation around the dog-walking areas adds sound and noise elements, and, combined with bird sounds, enhances the sense of unity with nature.
Access to thermal and airflow variability		• Thermal variability is available in the site as there are open spaces as well as shaded spaces throughout the park. • The area is in direct connection with air flow from the Bosphorus. Only the Barışkent complex, which is relatively tall, is located around the area, but it does not affect air circulation.
Presence of water		• There no presence of water in the park, but there is a visual connection to the Bosphorus.
Dynamic and diffuse light		• The area is illuminated with tall, medium-height, and recessed lights. The lighting is sufficient, but maintenance is lacking, with some recessed lights broken.
Connection with natural systems		• According to the parameter, the park should feature a combination of seasonal plants and evergreens. This parameter, however, has not been fully met as there is less use of evergreens in order to prevent the obstruction of the view.
Biomorphic forms and patterns		• The natural topography and slope of the area have been utilized to create scenic and recreational points. Levelling work has been carried out in the lower part of the area to create relatively flat surfaces for the playground. This has also helped preserve the view from the highest point of the area, which is the entrance.
Material connection with nature		• While granite and concrete have been used throughout the park, rubber flooring have been used in the playground areas. The material choices and colors, which are highly incompatible with nature, reduce the connection between the design and the natural environment.
Complexity and order		• This parameter is characterized by the presence of rich sensory information that is configured with a coherent spatial hierarchy. • Spatial hierarchy in the study site is ensured through the use of the topography, as well as the maintenance of proportion between plant materials. • In addition, ensuring that the lighting elements are not obstructed by trees reflect this parameter.

Prospect		• This parameter us characterized by the presence of an unimpeded view over a distance. • At first glance, the park cannot be fully perceived. There are spaces, however, within the park that has unimpeded views. Even from the flattest part of the park, view points and visibility to a large area is evident. • The slope of the land and the levelling work also contribute to this parameter.
Refuge		• The café, ceramic workshop, and areas under the trees in the park can be observed as shelter-like spaces.
Mystery		• Due to the slope of the land, the uses located below at the entrance of the park, and the ones on the left side of the park near the military area, remain unclear, which adds to the mystery of the space. • The circulation network connecting the children's playground and the dog-walking area includes labyrinths made of Cypress species, which is one of the points of mystery in the area.

CONCLUSIONS AND SUGGESTIONS

Cities, which have been driven toward rapid and uncontrolled development to respond to the rapidly increasing population, have disconnected from nature, and the bond between nature and humans has become increasingly urbanized and concrete. This situation has led humans to feel a longing and need for nature. As a result, new design philosophies have emerged to reconnect with nature. The concept of biophilia is often perceived as a new idea worldwide and is gaining increasing importance, particularly in Turkey. The biophilic design approach, however, is an integral part of most landscape architectural practices, where the needs of human and nature are met in a common platform.

In this study, we evaluated Çanakkale Özgürlük Park in means of biophilic design principles. The following conclusions were drawn with respect to the main principles involving biophilic design.

1. *Connection to Nature:* The park emphasizes a connection to nature by integrating various plant species, promoting biodiversity, and creating areas that imitate natural ecosystems. However, certain elements might not fully reflect the balance between seasonal and evergreen plants, reducing the alignment with biophilic principles.
2. *Sensory Engagement:* The park encourages sensory engagement with its minimal use of aromatic plants like Wisteria and Rose, which provide olfactory stimuli. The sounds of birds and dogs add auditory elements, contributing to a sensory connection with nature. However, the tactile experience of the park seems underdeveloped, as there are no specific elements to engage the sense of touch.
3. *Visual Connections:* The park leverages its topography and layout to maintain visual connections to scenic views, particularly the Bosphorus. Careful attention has been

given to ensure that certain areas, such as the entrance and view-points, are not obstructed by structures or vegetation.

4. *Natural Materials and Textures:* There is an apparent disconnection between the park's design and nature due to the use of materials like granite, concrete, and rubber flooring, which do not align well with biophilic principles. These materials detract from the natural feel of the park and disrupt its visual harmony with the environment.

5. *Integration of Natural Processes:* The park allows for the continuation of natural processes through its use of plant species and the preservation of views and air circulation. The use of natural topography and the appropriate levelling work has allowed for unobstructed views and better air flow, contributing to the park's overall biophilic appeal.

6. *Complexity and Mystery:* The park includes areas that evoke a sense of mystery, such as the labyrinth-like circulation paths created with Cypress trees, which contribute to the intrigue of the space. The varying elevations and plantings also enhance this feeling of discovery.

In conclusion, Çanakkale Özgürlük Park incorporates several aspects of biophilic design, such as visual and auditory connections to nature, the integration of natural topography, and diversity with plant species. However, there are areas for improvement, particularly in terms of sensory engagement, material choices, and ensuring a stronger connection between the design and the natural environment.

For example, the visual connection with nature can be enhanced by increasing plants in the park. In order to prevent the view from being obstructed, the use of shrubs, small trees, seasonal, and aromatic plants can be increased, which would also increase sensory stimuli. To enhance non-visual connections with nature, edible and olfactory plants could be incorporated into the park. Furthermore, in the green spaces designated for walking dogs, plants that could provide a habitat for wildlife can be used.

In the area left for festivals, the frequency of lighting can be increased, providing a safer recreational space. The compatibility of the materials used for the ground with nature is insufficient from a biophilic perspective. To address this deficiency, more permeable surfaces where grass joints are integrated can be used, and the color of concrete surfaces can be changed. Finally, the issues of cracks and subsidence in the walking circulation paths should be fixed to provide a safe and accessible recreational environment for all users.

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