

## **Evaluation of Biophilic Approach in the Design of Residential Sites; Case of Sinpaş Altınoran, Ankara / Turkey**

**<sup>1</sup>Asist. Prof. Dr. Hilal KAHVECİ**

**<sup>2</sup>Assoc. Prof. Dr. Parisa GÖKER**

*<sup>1</sup>Bilecik Şeyh Edebali University, Fine Arts and Design Faculty, Department of Interior Architecture and Environmental Design, Bilecik*

*Tel: 0090 535 669 1848, Hilal.kahveci@bilecik.edu.tr*

*<sup>2</sup>Bilecik Şeyh Edebali University, Fine Arts and Design Faculty, Department of Interior Architecture and Environmental Design, Bilecik*

### **ABSTRACT**

Translated as the "love of life", the biophilic design is a novel and popular trend within the scope of sustainable building design. As a human-oriented approach, the Biophilic Design aims at enhancing our connection with the nature, along with the natural processes within the buildings where we work and live. This enhanced connection can contribute our welfare by means of minimizing the stress, improving the rejuvenation, thus assisting as to reduce the costs and enhancing the outcomes within the built environment. The mass housing projects of the recent years aim at improving the environmental quality, presenting designs that meet the requirements of the nature, as well as creating a habitable environment that is sustainable in terms of economic, ecological and social aspects, while meeting the needs of society. In this study, we analyzed the designing process of Sinpaş Altınoran Residential Site, which is the largest housing Project of Ankara, in accordance with the principles of biophilic approach. Within the scope of this study, it is aimed at whether the area can be categorized under biophilic design approach based on our inspection on the locational selection, natural factors, the used structural and plantal materials and sustainability, as well as identifying the deficiencies. What we aim with this research is to explore and comprehend the meaning of biophilia and biophilic components within the design of residential sites in order to enhance the environmental and life quality, in addition to the benefits that we are able to obtain in terms of the experience of users, as well as the enhancement within the quality of built environment. Within the section named as "Results", the Sinpaş Project was analyzed within the scope of biophilic design criteria, as well as creating the evaluation tables. As per the results obtained, the need for the incorporation of Biophilia is emphasized in terms of enhancing the objectives of sustainability, along with the quality of built environment and the outlook of further researches in terms of the same matter.

**Keywords:** Biophilic design, sustainability, Environment, modern life

### **INTRODUCTION**

Since the very beginning of our existence, people have always a nature lover, while Biophilia is described as the attempt by people to imitate or introduce nature, along with its different forms within the built environment. Notwithstanding that the possibility is not supported by many evidences, what is emphasized by the recent scientific researches is that our deep-rooted ability to exercise nature is because of its noticeable impacts on psychological and physiological health of people. This can also clearly be seen from the preferences of the construction & design industry for integrating nature into the built environment, or building within and around the nature, itself (Abbas, Jawaid, 2017). The origin of the term "biophilia" comes from the Greek words "bio" (life) and "philia" (affinity) (Kellert et al. 1993). It is described as the "love of life or living systems" (Kellert et al. 2008). Erich Fromm, an American social psychologist who was born in Germany, introduced this term in his book, *The Heart of Man: Its Genius for Good and Evil* (Kellert et al. 2015).

Biophilia emphasizes the psychological orientation of being engaged with all species (Kellert et al. 2008). The Biophilic Design Framework has been created out of the Biophilia Hypothesis (Orman, 2017), setting forth an informative proposal that affinity of people and association with nature depend on hereditary and ecological adjustment forms. This exploration is intended to show how explicit natural phenomena apply to the built environment inside the Framework of Biophilic Design (Kellert, and Calabrese, 2015) and how the Biophilia Hypothesis is converted to the built environment. Then in 1984 the sociobiologist, Wilson, discussed and popularized the idea of the biophilic human being in his book *Biophilia*. Wilson described biophilia as "the natural tendency to focus on the mechanisms of life and life" (Basson, 2014). During a time of discovery and immersion in the natural world, he used the term "biophilia" to describe his intense feelings of connection to nature. The unique insight of Wilson was that this biophilic tendency evolved as part of evolutionary survival and thus contains some traits that even in modern cities remain with humans. He argued that a love of life is an innate human tendency and that "exploring and associating with life is a profound and complicated process of mental development" (Kellert et al. 2008).

The consideration of the biophilic approach includes the awareness of the biophilic design elements that affects different scales of the built environment, from the macro level of establishing green networks within urban planning programs to the micro-details of ensuring natural light for human comfort to the interior spaces. In an urban environment, nature interaction at a variety of scales is important to ensure a continued sense of connection with nature (Abbas, Jawaidd, 2017).

### **Biophilic Design Attributes**

Architectural design's ability to influence the physiological and psychological states of people is an extension of the biophilic connection to nature. The expression of this connection via biophilic design in architecture has occurred throughout the history, but now consciously all the time, or even acknowledged, while conveying a subjectiveness which testifies to its deep-rooted quality in people. By means of using the patterning, forms, symbols, materials and spaces that represent the nature, while evoking similar responds, the nature can be imitated (Abbas, Jawaidd, 2017). Notwithstanding that he did not use the term biophilia, Alexander expressed similar insight as follows, while recognizing this matter in his seminal book *Pattern Language* (Alexander et al. 1997):

*"Many of the patterns here are archetypal—so deep, so deeply rooted in the nature of things, that it seems likely that they will be a part of human nature, and human action, as much in 500 years as they are today"* (Newman et al. 2015).

What Alexander believed, as it is in biophilic design theory, was that the nature of environmental things within the scope of the pattern language possesses the ability to make everyone feel alive and human (Newman et al. 2015). The architecture and landscapes containing certain archetypal natural elements have got the expression within the urban design, when people cannot surround themselves with nature. Just like Wilson, Appleton suggested that the reactions of people to landscape and architecture are partially innate, so they cannot stray far from the natural patterning before annihilating their experience in aesthetics (Ramoie, 2014). He also suggested that in order to sustain an experience of welfare, humans are to seek to re-create something up of the primitive connection with nature, itself. The theory of prospect-refuge, as conceived by Appleton, suggests that people feel fine when feeling safe in a place of refuge, which is a feeling that improves whenever they have a window to the life itself, along with anything that occurs around. This reflects the inborn conservative need to survey for dangers from a safe place (Abbas, Jawaidd, 2017). Refuge and prospect on their own together are the most appealing, while on the other hand either one has the ability to contribute into the sense of being happy (Kellert et al. 2008).

**Table 1. Biophilic Design Elements and Their Corresponding Attributes**  
(International Living Future Institute, 2017)

<b>Environmental features</b> <ul style="list-style-type: none"> <li>• Color</li> <li>• Water</li> <li>• Air</li> <li>• Sunlight</li> <li>• Plants</li> <li>• Animals</li> <li>• Natural materials</li> <li>• Views and vistas</li> <li>• Façade greening</li> <li>• Geology and landscape</li> <li>• Habitats and ecosystems</li> </ul>	<b>Natural shapes and forms</b> <ul style="list-style-type: none"> <li>• Botanical motifs</li> <li>• Tree and columnar supports</li> <li>• Animal (mainly vertebrate) motifs</li> <li>• Shells and spirals</li> <li>• Egg, oval, and tubular forms</li> <li>• Arches, vaults, domes</li> <li>• Shapes resisting straight lines and right angles</li> <li>• Simulation of natural features</li> <li>• Biomorphy</li> <li>• Geomorphology</li> <li>• Biomimicry</li> </ul>	<b>Natural patterns and processes</b> <ul style="list-style-type: none"> <li>• Sensory variability</li> <li>• Information richness</li> <li>• Age, change, and the patina of time</li> <li>• Growth and efflorescence</li> <li>• Central focal point</li> <li>• Patterned wholes</li> <li>• Bounded spaces</li> <li>• Transitional spaces</li> <li>• Linked series and chains</li> <li>• Integration of parts to wholes</li> <li>• Complementary contrasts</li> <li>• Dynamic balance and tension</li> <li>• Fractals</li> <li>• Hierarchically organized ratios and scales</li> </ul>
<b>Light and space</b> <ul style="list-style-type: none"> <li>• Natural light</li> <li>• Filtered and diffused light</li> <li>• Light and shadow</li> <li>• Reflected light</li> <li>• Light pools</li> <li>• Warm light</li> <li>• Light as shape and form</li> <li>• Spaciousness</li> <li>• Spatial variability</li> <li>• Space as shape and form</li> <li>• Spatial harmony</li> <li>• Inside-outside spaces</li> </ul>	<b>Place-based relationships</b> <ul style="list-style-type: none"> <li>• Geographic connection to place</li> <li>• Historic connection to place</li> <li>• Ecological connection to place</li> <li>• Cultural connection to place</li> <li>• Indigenous materials</li> <li>• Landscape orientation</li> <li>• Landscape features that define building form</li> <li>• Landscape ecology</li> <li>• Integration of culture and ecology</li> <li>• Spirit of place</li> <li>• Avoiding placelessness</li> </ul>	<b>Evolved human-nature relationships</b> <ul style="list-style-type: none"> <li>• Prospect and refuge</li> <li>• Order and complexity</li> <li>• Curiosity and enticement</li> <li>• Change and metamorphosis</li> <li>• Security and protection</li> <li>• Mastery and control</li> <li>• Affection and attachment</li> <li>• Attraction and beauty</li> <li>• Exploration and discovery</li> <li>• Information and cognition</li> <li>• Fear and awe</li> <li>• Reverence and spirituality</li> </ul>

## MATERIAL AND METHOD

### Material

The research area is located at Ankara province, Çankaya district, Oran county. The area is bordered to TRT, MND (Ministry of National Defense) Mass Housing, Eymir Lake and Mühye Village. The area comprises a part of İmrahor Valley.



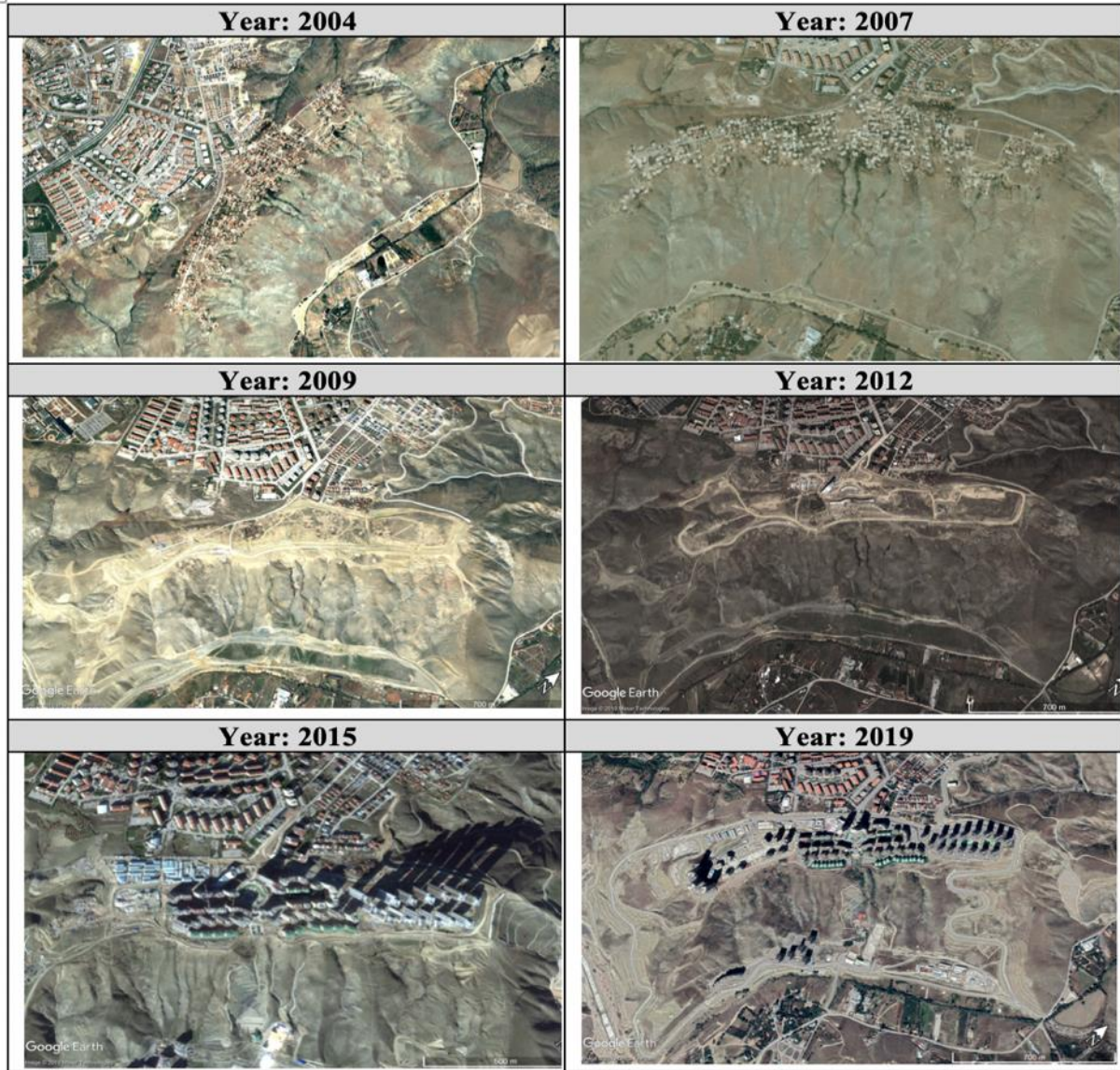
The photo was taken by the author, 2019

**Figure 1.** Research Area (Earth Pro, 2019)

### Area Properties

The Project Area was declared to be an Urban Transformation and Development Area of Güneypark pursuant to the Cabinet Decree no.: 661 dated as 07.07.2011 and Ankara Metropolitan Municipality Decision no.: 2196 dated as 16.07.2011. While having 2100 beneficiaries that comprise of individuals, companies and cooperatives, the sole beneficiary of the area has become Ankara Metropolitan Municipality after being declared as an urban transformation area. The Municipality entered into an agreement with Sinpaş REIT (Real Estate Investment Trust) in 2012 (Ankara Metropolitan Municipality, 2010).





**Figure 2.** Changes of the study area according to the years (Earth Pro, 2019)

### Method

Within the scope of the study, the area, where Sinpaş Altınoran Residential Site is located, was subjected to an analysis in terms of its locational aspects in the beginning. Analyzing the aerial images before the urban transformation process, the area was examined deeply in terms of its change and transformation in the process. The aerial images were transferred into Autocad, thus preparing the current settlement plan.

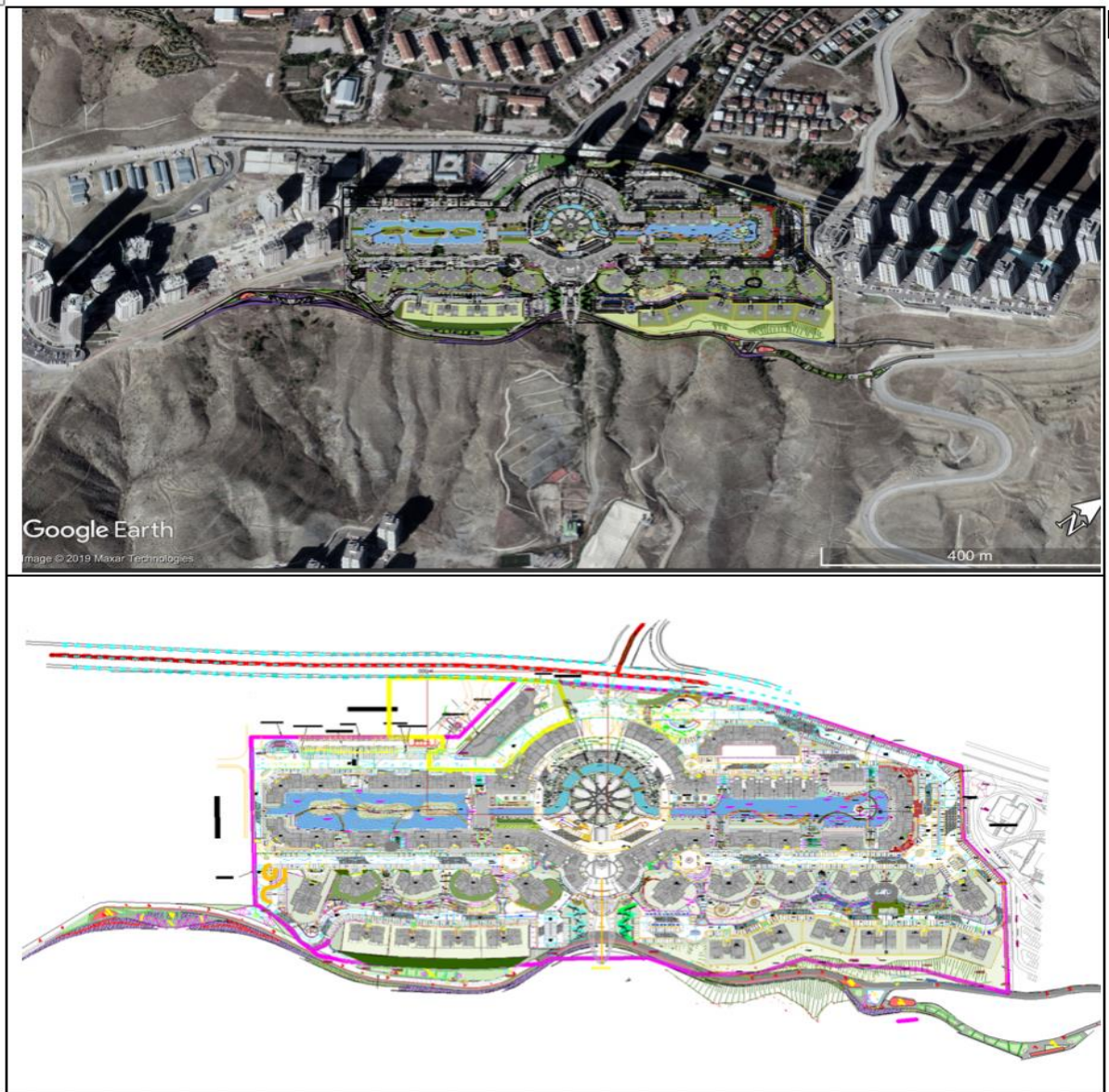
The open green areas and immediate vicinity of the Sinpaş Altınoran premises were also inspected considering the Biophilic design criteria. Evaluation forms were prepared for obtaining more detailed results. Analyzing the location, general design, properties, structural and plantal material usage, spatial organization, social activities, etc. under each heading, the capacity of the area to meet the biophilic design conditions was identified. In the "Conclusion" section, certain suggestions were developed to be used within the scope of open-green development and landscape studies, based on identifying the current state, deficiencies and mistakes of the project.



## Results and Discussion

### Project Features

Altınoran Mass Residential Site, located on the landed property with the plot no.: 29903 and parcel no.: 10 in Ankara province, Çankaya district, Mühye Quarter, was built as 5 stages, of which construction site comprises of 2647 residential houses, 46 blocks, 2 towers and 4 urban residences. The project was built on an area of 1.850.000 m<sup>2</sup>, having a landscaping area of 620.000 m<sup>2</sup>. An ice-skating rink, children valley, ski track, Aqua Star Water Fest Area, telpher, thematic gardens, Adventure Valley, Skywalk Bridge, Altınoran square, commercial units and a bazaar are available in the project area. The towers named as "1923", "2023" and "Cumhuriyet", along with Yüzyıl Square with star and crescent are the prominent symbolic properties of the project. A shopping mall, cafe and restaurants are projected to be built within the area. Green bridge and ducts, biking and hiking tracks, ponds, dockages, ecological bazaar and sport complexes can be shown as the other properties of the project. Within the scope of landscape design, various tree/bush types are included in the project.



**Figure 3.** Landscape Design Project of Sinpaş Altınoran Residential Site (Original, 2019)

The main concept of the land-use and design is the square that offers a significant opportunity for socialization. Accessible by passing through the 40-storey tower buildings,

which are aimed to be rendered as a “landmark” for the capital of Turkey, the town square has an uninterrupted view to the valley. In the project, presenting an enriched building variance within the North-South direction on both sides of the square, there are buildings lined up around the water line which enables the presence of two separate sides facing against each other. The square is connected through the sets created by means of utilizing the land incline, where the building axis is settled. Designed as an amphitheater, the sets ensures the square to be used for such open-area public activities as concerts, celebrations, artistic performances, etc.

This large town square intersects the “Agora” building comprising of social, commercial and recreation programs and creating a second square of 2000 m<sup>2</sup> in the project, while being connected to the settlements areas in the lower parts of the slope through a funicular railway system. Thanks to its cascaded design, Agora building is accessible through each and every elevation where all the social needs and activities are met, acquiring the qualification to be an enriched meeting area for users by ensuring the same to intertangle with each other both horizontally and vertically.

## **Assessment of Sinpaş Altınoran Residential Site In Terms Of Biyophilic Design Principles**

### **1- Environmental Features**

#### **• Color**

The color master plan process for a city can be described as the entire phases that strengthen the architectural identity of that area, which is a must for establishing the color orders where the colors are used on suitable contrast levels in terms of visual perception, while matching with the natural and artificial environmental properties and colors, as well. The steps in this planning process can be listed as follows for various scales of the city (Küçükılıç, Ünver 2014).

- Carrying out the color analysis of the existing natural and artificial environment,
- Analyzing the architectural properties of the region and structures,
- Analyzing such properties as per the factors that are specific to color perception.

Examining the concept “color” in line with the design principles within the scope of the design of study area, the colors used are not in harmony. The shades of the colors “beige, brown and pink” were used on the facade design for achieving the harmony with nature, however the shades of “green” were substantially used in the landscape works.

#### **• Water**

The “water” element plays a directive role in open spaces, as well. The effect of water is crucial in the formation of the space. It has the ability to direct people to the emphasized point, depending on the way the water is used. In general, it is the linear water ducts or rectangular pools that have the directive effect. Such water elements may be in harmony with the transportation and walking efficiency. The elements in the space can also be used symbolically or in a manner that bears a meaning. To give an example, the water element may undertake a symbolic role as an element separating the activity areas, in addition to its refreshing effect. Or, a water element structured as a noise barrier can also serve for decorative purposes. Sometimes, the water elements constitutes a strong factor by coming unstuck from the general composition of the space in terms of functional, symbolical or formal aspects. This enables the water to be used as a focusing element. Such water elements may be in harmony with gathering, waiting activities.

The water element was effectively used in the research area. The main area of the Project comprises of Altınoran square and two wings extending through North-South direction. Fountain pools in circular form are placed in a manner supporting the circular form of Altınoran square. Besides, the effect of water is supported through lighting and water dance system accompanied with music on certain times during the day. There is a large-scale



ecological pond in the center of both backyards extending along the North-South direction of the area.

This pond, located in direction of the mansion houses, extends along the backyard, and the pond width is lined off with the buildings. The central area was completely planned as water element, and the passages are through the bridges built over the pond. A green area was created by means of artificial islands in the pond, while placing various plants.

The ecological pond facing to the backyard near the lake-houses ends in the gardens of the houses. The passages are placed around the pond, and a circular form island was designed with a sitting area in harmony with the passage ways. Gardens are designed between the blocks on the lowers sets of the area, designed as sets in line with the topography of the land, as well as involving water ducts in the design.

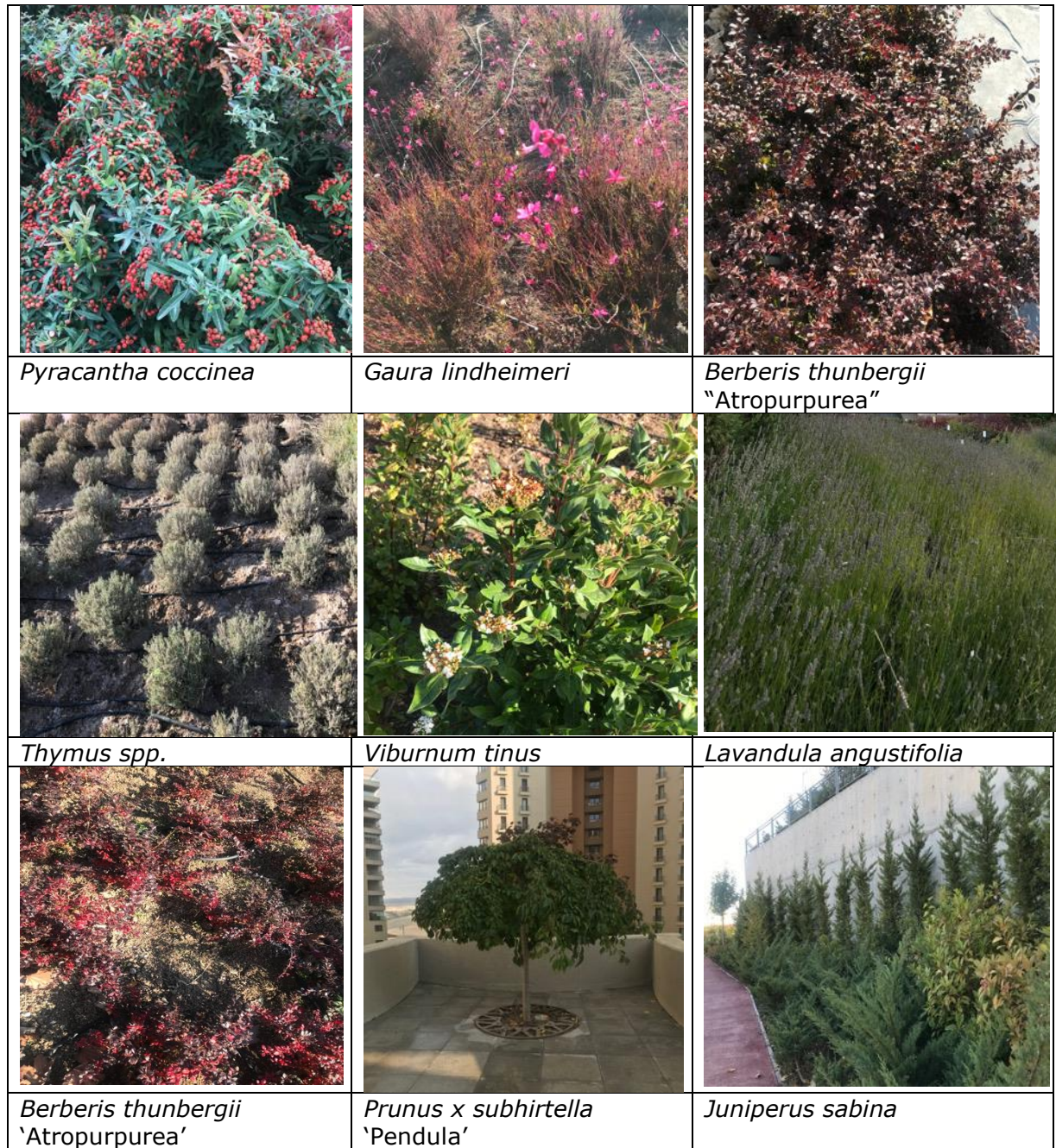


**Figure 4.** Use of water elements (Original, 2019)

- **Plants**

One of the factors aimed at achieving within the scope of urban landscape designs is to establish a balanced relation between the people and nature, while on the other hand carrying the reflections of natural spaces to the urban areas. One of the other factors is to create a landscape that is sustainable in terms of aesthetical, functional and ecological aspects. For this reason, plantation designs play a crucial role in the landscape designs (Roninson 2004; Sari, Karasah 2018). Various trees, bushes and flowers are included in the plantal design of the Project area. However, there are certain problems due to the selection of plants without considering the climate conditions, maintenance & repair, etc.





**Figure 5.** Plants material used in research field (Original, 2019)

**Table 2.** Samples of plant material used in the research field (Original, 2019)

	Plant Taxon	Turkish name of the plant
1	<i>Acer negundo</i>	Dişbudak yapraklı akçaağaç
2	<i>Acer palmatum</i> 'Atropurpureum'	Kırmızı Yapraklı Japon Akçaağacı
3	<i>Acer platanoides</i> 'Globosum'	Top Akçaağaç
4	<i>Ailanthus altissima</i>	Kokarağaç
5	<i>Berberis thunbergii</i> 'Atropurpurea'	Kırmızı Yapraklı Kadın Tuzluğu
6	<i>Betula pendula</i>	Huş ağacı
7	<i>Cornus sanguinea</i> L.	Kiren

8	<i>Cotoneaster franchetti</i>	Yaprağını dökmeyen dağ muşmulası
9	<i>Cotoneaster horizontalis</i>	Yayılcı dağ muşmulası
10	<i>Euonymus alatus</i> (Thunb.) Siebold	Alev Taflanı
11	<i>Euonymus japonica</i> 'Aurea'	Altuni taflan
12	<i>Forsythia</i> × <i>intermedia</i>	Altın çanak
13	<i>Gaura lindheimeri</i>	Gaura
14	<i>Juniperus sabina</i>	Sabin ardıcı
15	<i>Juniperus squamata</i> 'Blue Carpet'	Yayılcı mavi ardıç
16	<i>Lavandula angustifolia</i>	Lavanta
17	<i>Mahonia</i> spp.	Mahonya
18	<i>Malus communis</i>	Elma
19	<i>Morus alba</i> 'Pendula'	Sarkık dut
20	<i>Photinia fraseri</i>	Alev çalısı
21	<i>Prunus cerasifera</i> 'Atroprpurea'	Süs eriği
22	<i>Prunus x subhirtella</i> 'Pendula'	Beyaz çiçekli ters ağılı süs kirazı
23	<i>Pyracantha coccinea</i>	Ateş diken
24	<i>Robinia pseudoacacia</i> 'Umbraculifera'	Top akasya
25	<i>Rosa</i> spp.	Gül
26	<i>Rosmarinus officinalis</i> L.	Biberiye
27	<i>Salix alba</i>	Ak söğüt
28	<i>Salix babylonica</i>	Salkım söğüt
29	<i>Tagetes erecta</i>	Kadife
30	<i>Viburnum tinus</i>	Defne yapraklı kartopu

#### • **Animals**

Certain fish species and ducks are included in the design of ecological ponds considering the idea of living in the nature. Following the observations we made, it was found out that the dwellers of the residential site have pets (one or two dogs). However, there is no closed play ground for the site dwellers to take their pets for a walk.



**Figure 6.**



- **Natural materials / views and vistas**

There is a valley on the eastern section of the settlement plan, designed as sets using the topographical properties of the area. Hiking tracks and resting/viewing areas were created with a view to the valley in the set where the settlement has begun. Moreover, a telpher system was established for getting down to the valley, the Skywalk was integrated into the telpher system, thus building a terrace for viewing. Natural materials were used as structural process, as it was in Pergola.



**Figure 7.** Scenic cruising points created in the walking area (Original, 2019)

## 2- Natural shapes and forms

- **Tree and columnar supports**

Natural materials were used in the structural process within the sitting/viewing areas, along with the hiking tracks with a view to the valley. Additionally, as recycling materials, old electric poles were used for the passage ways in the gardens, thus making a design that is in harmony with the nature.

- **Egg, oval, and tubular forms**

Oviforms were generally used in the landscape design. It was substantially used in the flower parterres placed in the islands, pond and gardens within the lake area.

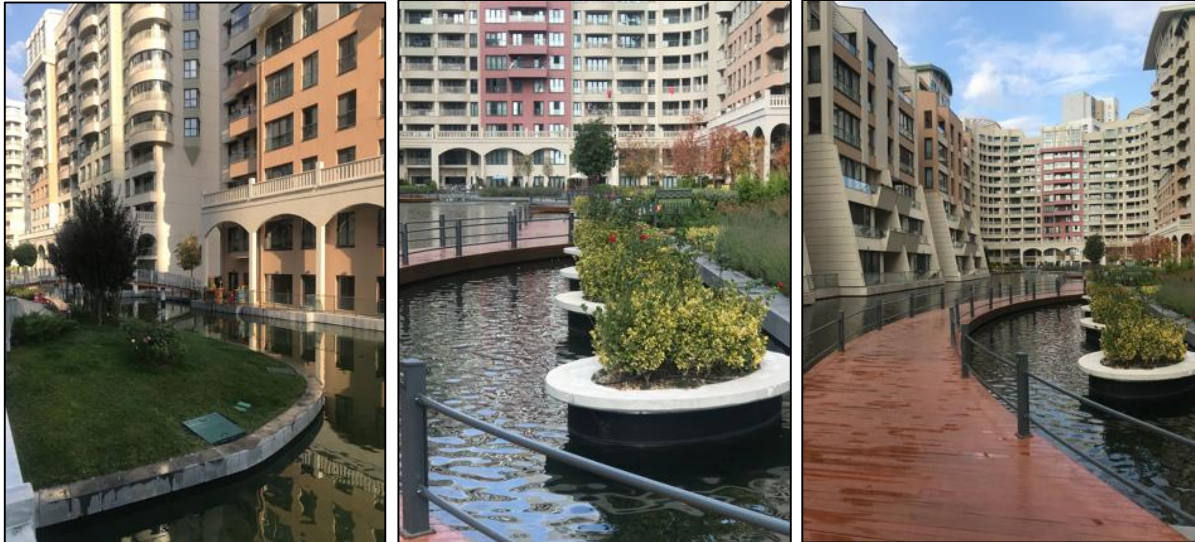


**Figure 8.** Use of Egg, oval forms in Landscape design (Original, 2019)

- **Arches, vaults, domes / Shapes resisting straight lines and right angles**

Truffles, covering the entrance and first floor of the structures in the architectural design, were designed, as well as placing a terrace for the third floors.





**Figure 9.** Use of arches and stright lines in structural design (Original, 2019)

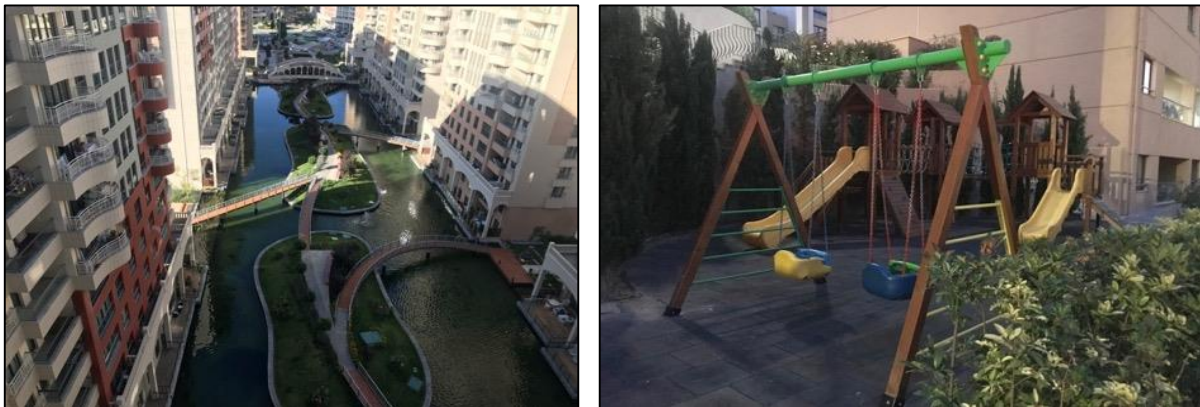
### 3- Natural Patterns and Processes

- **Sensory variability**

Sinpaş Altınoran Residential Site is located in a metropolitan city with high population. The amount of open green areas is decreasing day by day due to dense housing. The water elements, along with the green area designs (hiking tracks, green textures in the island form, Altınoran square, etc.) used in Sinpaş Altınoran Residential Site allows the residents of the site to have the feeling of living in and communing with the nature.

- **Central focal point / Bounded spaces / Transitional spaces / Linked series and chains / Integration of parts to wholes**

Taking the general design characteristic of the research area into consideration, it can be seen that it has a central-oriented planning scheme. The square is placed to the center of the area, while two wings are placed on the North-South direction. There are two towers at the square. Bounded spaces were designed in various parts of the site and various activities were projected to be carried out in these areas. In addition, playgrounds, basketball fields and recreation areas especially created for children are located in this area as well. Moreover, the transition roads and bridges are designed on the ecological pond and between the gardens, ensuring mobility and balance in the area.

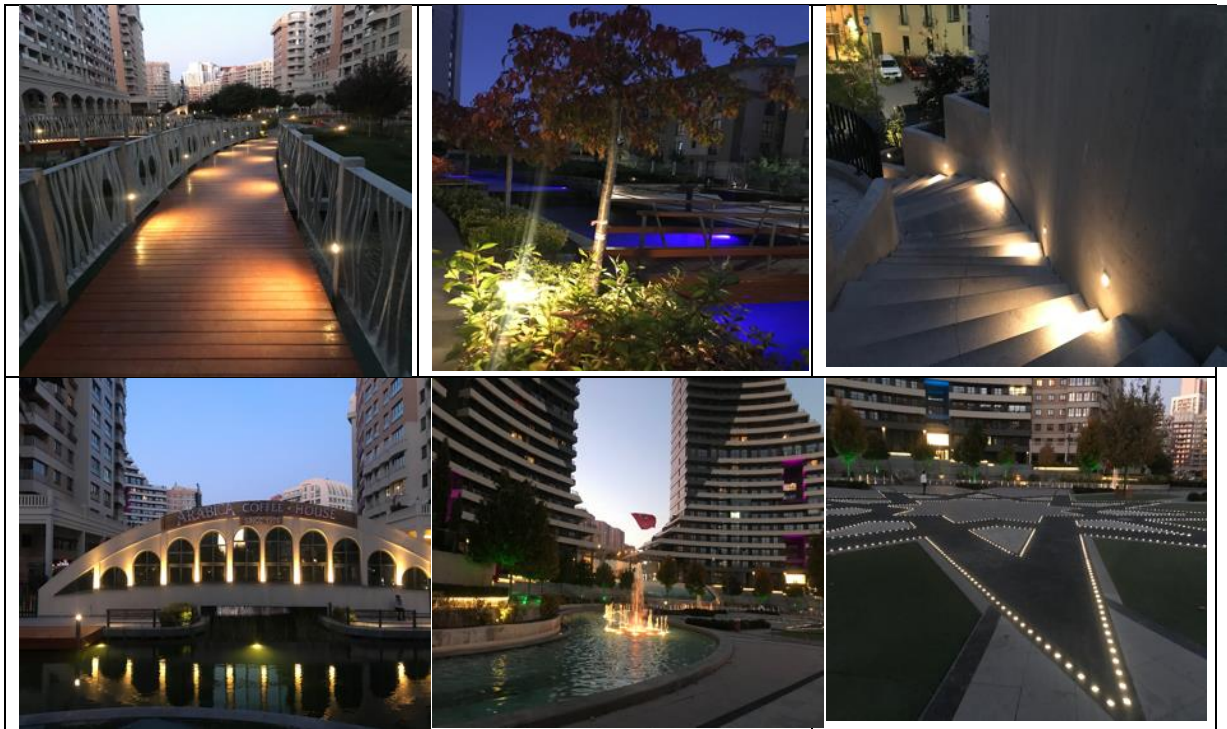


**Figure 10.** Transition fields / Bounded spaces (Original, 2019)

#### 4- Light and Space

- ***Natural light / Filtered and diffused light / Light and shadow / Reflected light / Light pools / Warm light / Light as shape and form***

Lighting is one of the most important factors required by people to maintain their life. People have the ability to perceive the physical space they are in through light, color, audio, temperature, humidity, air and odour. Since 95% of the information that people acquire through different perceptions is through visual perception, light is of crucial importance among these elements (Öztürk, 1992). Lighting systems are available in the project area. Various lighting options are included as Filtered and diffused light / Light and shadow / Reflected light / Light pools / Warm light / Light as shape and form headings. For example, in order to concretize areas such as passageways, connection roads, serial road lightning systems, light pools in the pools, along with the light reflection technique in harmony with the colors under the plant materials were utilized, as well as establishing a structure lighting system for creating a focal point in the facades of the structures.



**Figure 10.** Use of Light and shadow / Reflected light / Light pools (Original, 2019)

- ***Spaciousness / Spatial variability / Space as shape and form / Spatial harmony / Inside-outside spaces***

Spatial changes, spatial harmony and interior-exterior space relations were designed within a harmonized manner in the site. Altınoran Bazaar, on the other hand, was designed as a semi-open space, which was oriented to be used as a shared area. However, it was covered with a tent for protection against the precipitation (rain, snow) and wind effect based on the climatic characteristics of the region. The material used is PVC, bearing the characteristic of waterproofing and light transmittance.



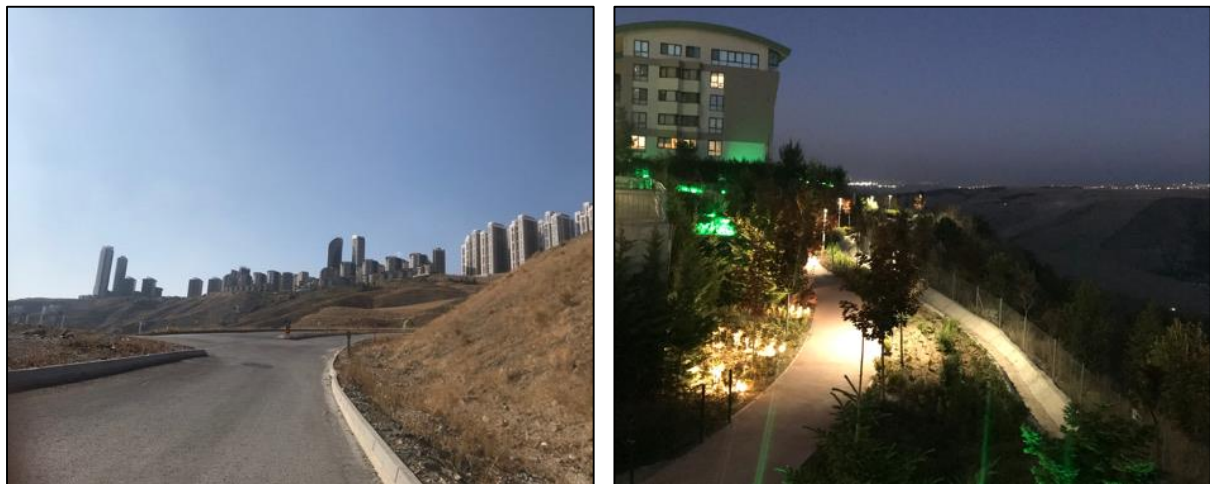


**Figure 11.** Interior-exterior relation / Spatial harmony (Original, 2019)

## 5- Place-based Relationships

### • *Geographic connection to place*

Altınoran Residential Site is located in a certain part of İmrahor Valley, where the altitude differences is relatively high on geographical aspect. It was built on a level area with a great view to the valley on the peak point of the sloping land within this part of the valley. Despite being located outside the city, Altınoran Residential Site is connected to the city centrum and other living areas through asphalt roads.



**Figure 12.** Topography and geographical location of the area (Original, 2019)

### • *Cultural connection to place*

Notwithstanding that the shared areas are prioritized for cultural socialization, individual time-spending areas were designed.

### • *Indigenous materials*

Wooden equipment components were used as natural materials in the area.

### • *Landscape orientation*

Altınoran Residential Site is addressed as the reflection of natural areas that are in harmony with its immediate surrounding to the cit in terms of landscape design aspects. Roads with organic lines, along with ponds and plantings reflect this conception. For making each and every point of the area accessible, passageways were placed through bridges over the ponds within the main circulation, while establishing wooden platforms over water where people living in the lower floors integrated with water and have a nice time. The square was planned to be as the meeting & dispersal areas that is close to the shopping units with



the objective in mind to improve socialization (entertainment, resting, hiking, enjoying the view, trekking, etc.).



**Figure 13.** An example that is in harmony with the nature, Altınoran Residential Site, hiking track (Original, 2019)

- ***Landscape features that define building form***

The building forms are ended with a curved line that is vertically in compliance with the landscape design.

- ***Landscape ecology / Integration of culture and ecology***

Locationally, the site is located in the central district of Ankara province, Central Anatolia Region. It is located outside the city center. In Altınoran Residential Site, located at an altitude of 1100 m, the cold-resistant plant species should be used due to harsh climatic conditions. Ecological and cultural areas coexist in open spaces designed in the middle of the buildings. Plantings, ponds, animal shelters in open green areas can be considered as an opportunity for people to experience nature in an urban environment.

- ***Spirit of place***

Naturality is felt with the landscape design that is projected to reduce the effect of the dense settlement in the vertical direction. In addition, the presence of plant species, where we can feel seasonal changes, adds a different taste to the area.

- ***Avoiding placelessness***

Areas such as promenades, squares, lawn areas, viewing terraces and residents can be channeled to various activities. Thus, residents of this site can be provided to spend more quality time.

## **6- Evolved human-nature relationships**

- ***Prospect and refuge / Order and complexity***

The site has a beautiful view. The wastes are removed from the area with the lower sewage system without disturbing people. Open areas of Altınoran Residential Site are generally in harmony with the environment. The intersection of the grass fields and ponds with the road and organic lines, the pedestrian paths coming from the squares that direct people to the recreation areas are in harmony with each other, thus not leading any confusion.

- ***Curiosity and enticement***

There are certain places in the Altınoran Residential Site and its immediate surroundings that will arouse curiosity and interest of people. Squares supported by planting compositions, pedestrian paths and glass balconies with a wonderful view create this effect. Connecting the islands surrounded by ponds with bridges encourages people to visit this area, as well.

- **Change and metamorphosis**

The biggest change in the area which is at an ecologically high altitude, the use of water on an relatively higher basis has brought the area to a completely different ecology.

- **Security and protection / Mastery and control**

Thanks to the presence of a security officer among the site staff, people feel peace and comfortable within the site. In addition, people can move comfortably in the day and night times to areas with the minimization of the visual closure effect in open green areas. There are security units and security guards to ensure the safety of people, as well.

- **Affection and attachment / Attraction and beauty**

The effects of Altınoran Residential Site and its surroundings on people are conferred to be positive. The site and its immediate surroundings have impressive natural and cultural landscape views.

- **Exploration and discovery**

Gradual viewing and walking terraces towards the valley in the close vicinity of the site encourage people to explore nature and take a step into the healthy life.

- **Information and cognition**

There are signs and plates for information both within the site and in the immediate vicinity of Altınoran.

- **Fear and awe**

There are certain situations that users should pay attention to. To give an example, it is very important for children and pets to use light-green areas in a controlled manner, notwithstanding that the security measures are taken in the immediate vicinity of the ponds, as deemed required. In addition, the fact that the slope is high in the close vicinity of the site encourages users to be more careful, as well.

- **Reverence and spirituality**

Religious units are available in the open areas of Altınoran site.

## Conclusion

In line with Biophilic design criteria, sustainable and ecological-based settlements should be created. In this context, living spaces should be designed within an environmentally sensitive manner, while needing minimum energy, being well insulated, having a good management system for wastes, providing the necessary energy for heating and lighting with natural and active systems and protecting the green texture on the land to be built, as well as being self-sufficient. Within the scope of Biophilic design criteria, Sinpaş Altınoran website has been examined considering all the titles of Biophilic design approaches (From Table 3 to 8).

**Table 3.** Environmental Features (Original, 2019)

Environmental Features			
	Aim	Evaluation	Sinpaş Altınoran (Description)
Color	Use of colors suitable for nature	-	In the project, the concept of color was not used correctly in the use of both structural and plant material.
Water	Natural and Artificial water elements	+	Importance was given to the use of water elements in all areas of the project. There is an ecological pond, water canals and light pool.

Air	Orientation of the settlement so that maximum benefit from the sun and wind	-	Since the main residential area is designed as a courtyard, no air circulation is provided. The buildings located on the lower terraces (valley view) are subjected to extreme wind due to the weather and climate conditions of the region.
Using daylight effectively	Using daylight effectively	+	Slope and orientation: South, South East direction, the correct slope direction was used in the construction.
Natural Materials	Use of recycled and natural materials / Environmental harmony of design	+	In the walking area, recycling electric poles were used as structural material.
Views and Vistas	Use of land form such as Valley Bases	+	Since it is generally used in lots of plant material, a design suitable for nature has been realized.
Geology and Landscape	Adaptation to Topography	+	The project is designed in sets according to the topography of the area. Living space with different design was created in each set.
Habitat and Landscape	Landscape design, protection and development of flora and fauna	+	Many green areas have been created in the project area. However, generally wrong plant choice was made. Due to the preferred plants without considering the climatic characteristics of Ankara, the effect of plant material is seen in certain seasons of the year. Numerous angiosperm trees were used. The use of gymnospermae (evergreens) species instead would have provided a more effective appearance.

**Table 4.** Natural Forms and Shapes (Original, 2019)

Natural Forms and Shapes			
	Aim	Evaluation	Sinpaş Altınoran (Description)
Botanical Motifs	Sense of natural life	-	No elements containing plant motifs were used in the design.
Tree and Columnar Supports	Sense of natural life	+	In the main courtyard of the project, in the design of the square and especially in the walking area, the use of trees was included.
Egg, Oval and Tubular Forms	Harmony of architectural	+	Oval/egg forms are used in landscape / structural design.



	design with natural life		
Arches, Vaults, Domes	Harmony of architectural design with natural life	+	The arches were used in the design of the façades in order to support the terrace design and form a portico. The design with domes is used in the roof system of buildings such as outdoor elevators.
Shapes Resisting Straight Line and Right Angles	Use of geometric patterns and straight lines in design	+	Straight line and right angle shapes are used in various structural designs. Particularly used in building pockets, niches of arches used in the façade.
Geomorphology	Design in accordance with the topography of the area	+	The project is designed in sets according to the topography of the area. Living space with different design was created in each set.
Biomimicry	Design inspired by nature	-	There are no design examples inspired by nature.

**Table 5.** Natural Patterns and Processes (Original, 2019)

Natural Patterns and Processes			
	Aim	Evaluation	Sinpaş Altınoran (Description)
Sensory Variability	Creating a sense of natural environment	+	Large square in the project area, modern life, the presence of water elements. Especially the fact that the project is located in a big city with a high population provides an opportunity for people to live in nature with the valley view and walking paths.
Information Richness	The field contains a wealth of information in every aspect	-	Generally, there is no information sign anywhere in the area. In addition, there is no activity aimed at informing the public.
Age, Change and the Patina of Time	Suitable for all ages	+	Various activity opportunities are considered for each age group within the site.
Growth and Efflorescence	Demonstrating the life cycle of the natural environment	+	The plant design used provides the opportunity to monitor the life cycle of the plants for the people living in the project area.
Central focal point	Focal point creation, gathering area	+	The Altınoran Square was designed with the aim of creating a central focal point.
Bounded Spaces	Delineated space with clear boundaries or borders	+	Children playgrounds, covered seating areas and the Altınoran bazaar designed within the project area are examples of bounded space formation.
Transitional Spaces	Determination of transition areas	+	Bridges were created on the ecological pond built within the project area and transition areas

			were designed. In addition, in order to support intertwined life with nature, passageways between green areas have been provided.
Dynamic Balance and Tension	Use of Dynamic Balance and Tension in design	-	Main courtyard of the project area (Lake Houses and Waterside Houses) provides dynamic balance but other areas of the project do not provide sufficient dynamism.
Hierarchically Organized Ratios and Scales	Hierarchy design in accordance with design principles considering ratio and scale	-	Unfortunately, concrete is dominant in the project area. There is insufficient green space to camouflage the use of concrete.

**Table 6.** Light and Space (Original, 2019)

<b>Light and Space</b>			
	<b>Aim</b>	<b>Evaluation</b>	<b>Sinpaş Altınoran (Description)</b>
Natural Light	Design to benefit from sunlight	-	The layout and building heights prevent the use of sufficient natural light and solar sources.
Reflected Light	Use of light reflection in both structural and plant material design	+	Reflective lighting is used in building facades and plant material planters.
Light Pools	Use of light in pool design	+	Lighting system was used in both ecological ponds and pools designed as canals and waterfalls.
Warm Light	It should be used precisely because it is close to the natural light source	-	Warm light color was preferred more in the garden and building.
Spaciousness	Create a sense of wellbeing for those living in the area	+	Even though the structural design is intertwined, the courtyard created in the common area is partly spacious. However, the walking area with a view of the valley gives the residents a feeling of spaciousness.
Spatial Variability	Monotony prevention by creating different usage areas	-	At the design stage, the concept of spatial variability was ignored.
Space and Shape Form	In design, a holistic approach should be followed without spreading form and space concepts.	-	The project area and the structural material within the site are not designed in harmony with each other.
Spatial Harmony	Planning of open spaces within		The project area and the structural material within the site

	residential areas in the direction of building facades and planning in connection with internal pedestrian circulation of the residential area	-	are not designed in harmony with each other.
Inside-Outside Spaces	Interior and exterior design in harmony with each other	+	In addition to outdoor areas various interior spaces (cafes, restaurants, playgrounds etc.) have been created in order to strengthen social activity in the project area.

**Table 7.** Place-Based Relation (Original, 2019)

<b>Place-Based Relation</b>			
	<b>Aim</b>	<b>Evaluation</b>	<b>Sinpaş Altınoran (Description)</b>
Geographic Connection to Place	Connection of the area with its surrounding	+	Although Altınoran Residential Site is located outside the city, it has connections to the city center and other living spaces through asphalt roads.
Historic Connection to Place	State of the area in the previous years	+	Before the site was built, slum houses were located in this area. It has gained its present appearance within the scope of the urban transformation project.
Ecological Connection to Place	Ecological benefits obtained from the area	-	The project area is subjected ecologically challenging environmental conditions. Environmental conditions have been improved with various studies based on the fact that it is in a high position in terms of altitude, and the establishment of the site being on a sloping area.
Cultural Connection to Place	People feeling that they belong to the area	+	Notwithstanding that the shared areas are prioritized for cultural socialization, individual time-spending areas were designed
Indigenous Materials	Design with natural materials	+	Wooden equipment components were used as natural materials in the area.
Landscape Orientation	Conveniently accessible areas by users as intended	+	Roads with organic lines, along with ponds and plantings reflect this conception. For making each and every point of the area accessible, passageways were placed through bridges over the ponds within the main circulation, while establishing wooden platforms over water where people living in the lower floors



			integrated with water and have a nice time.
Landscape Features that Define Building Form	Ensuring integrity in the design	+	The building forms are ended with a curved line that is vertically in compliance with the landscape design.
Landscape Ecology	Ensuring the sustainability of structural and plantal elements in the design	-	Locationally, the site is located in the central district of Ankara province, Central Anatolia Region. It is located outside the city center. In Altınoran Residential Site, located at an altitude of 1100 m, the cold-resistant plant species should be used due to harsh climatic conditions.
Integration of Culture and Ecology		+	Ecological and cultural areas coexist in open spaces designed in the middle of the buildings. Plantings, ponds, animal shelters in open green areas can be considered as an opportunity for people to experience nature in an urban environment.
Spirit of Place	Revealing the design theme	+	Naturality is felt with the landscape design that is projected to reduce the effect of the dense settlement in the vertical direction. In addition, the presence of plant species, where we can feel seasonal changes, adds a different taste to the area.
Avoiding Placelessness	Having a quality time	+	Areas such as promenades, squares, lawn areas, viewing terraces and residents can be channeled to various activities. Thus, residents of this site can be provided to spend more quality time.

**Table 8.** Involved Human-Nature Relationship (Original, 2019)

<b>Table 8. Evolved Human-Nature Relationship</b>			
	<b>Aim</b>	<b>Evaluation</b>	<b>Sinpaş Altınoran (Description)</b>
Prospect and Refuge	Developing the conception of aesthetics	+	The site has a beautiful view. The wastes are removed from the area with the lower sewage system without disturbing people.
Order and Complexity	Supporting an even-life	+	Open areas of Altınoran Residential Site are generally in harmony with the environment. The intersection of the grass fields and ponds with the road and organic lines, the pedestrian paths coming from the squares that direct people to the recreation areas are in harmony



			with each other, thus not leading any confusion.
Curiosity and Enticement	Encourage them to engage in useful activities	+	Squares supported by planting compositions, pedestrian paths and glass balconies with a wonderful view create this effect. Connecting the islands surrounded by ponds with bridges encourages people to visit this area, as well.
Change and Metamorphosis	Creating different and different areas	+	The biggest change in the area which is at an ecologically high altitude, the use of water on an relatively higher basis has brought the area to a completely different ecology.
Security and Protection	Supporting safe living	+	Thanks to the presence of a security officer among the site staff, people feel peace and comfortable within the site. In addition, people can move comfortably in the day and night times to areas with the minimization of the visual closure effect in open green areas.
Mastery and Control	Ensuring the users to be in peace and comfort	+	There are security units and security guards to ensure the safety of people.
Affection and Attachment	Social impact on people	+	The effects of Altınoran Residential Site and its surroundings on people are conferred to be positive.
Attraction and Beauty	Creating richness in terms of aesthetical aspects	+	The site and its immediate surroundings have impressive natural and cultural landscape views.
Exploration and Discovery	Curious designs	+	Gradual viewing and walking terraces towards the valley in the close vicinity of the site encourage people to explore nature and take a step into the healthy life.
Information and Cognition	Getting information	-	There are signs and plates for information both within the site and in the immediate vicinity of Altınoran.
Fear and Awe	Safe design approaches without danger	-	There are certain situations that users should pay attention to. To give an example, it is very important for children and pets to use light-green areas in a controlled manner, notwithstanding that the security measures are taken in the immediate vicinity of the ponds, as deemed required. In addition,





			the fact that the slope is high in the close vicinity of the site encourages users to be more careful, as well.
Reverence and Spirituality	Religious activities	-	There is a masjid in Altınoran Residential Site. However, a number of people with foreign nationalities live in the site, as well. Even in the sales policy, the presence of people of different religions has been ignored on a site that appeals to a foreign audience.

### Major problems detected following the analysis:

#### • Irrigation Systems

Due to the fact that the required adjustments are not made for irrigation processes with fountains, the consumption rate of water increases, thus not ensuring a homogenously balanced irrigation on the fields. Water leakages are also experienced due to the breakages and wearing in the materials used for irrigation/dripping systems. Since there is no planned treatment and storage system for storing rainwater, field irrigation is costly and water consumption savings cannot be achieved, either.

#### • Sustainability of Landscape Areas

The selection of plants suitable for the geography could not be performed on a healthy basis and most of them were completely destroyed, and the project shows a random change in terms of landscape since there is no planting inventory. Since the gardeners working in the field do not have a maintenance map and checklist, it cannot be performed properly and the damaged plants cannot be replaced. Considering the size of the owned area, there is no greenhouse and maintenance area to meet the needs of the project. Pest spraying in landscape areas and shared areas is performed on an unplanned manner for plant diversity and pest species, thus causing damage on the fauna.

#### • Energy Efficiency and Consumption

The lighting products used in the field are not led, but mostly consist of classical type bulbs and fluorescent. Therefore, the general electricity consumption cost is high. Since there is no smart infrastructure and sensor system in the fields, the system in the field is opened and closed manually or based on an hourly schedule. This increases the energy consumption rate, and maintenance and repair cannot be performed without visual inspection in the places of malfunctions. Solar panels that can be used in many areas of the field are not included in the design, thus not being established. For this reason, the chance of ensuring the saving of a large amount of electricity has been missed.

#### • Security of the Field

It has been conferred that the social areas in the field are partially closed to entrance by outsiders, but they are inadequate in terms of camera and personnel, which also weakens the security.

### RECOMMENDATIONS

Since the very existence of humankind, we have lived with nature, but recently, this situation has changed and urban life has begun by moving away from nature. Factors such as people having health problems as a result of the environmental problems experienced and the rapid depletion of natural resources brought new search areas to the agenda. With people longing for nature, along with the desire to be in touch with nature, it actually brought up the concept of Biophilic design or Life-Friendly Design. Biophilic design is the design of the built environment that we are in, in connection with nature with an innovative

perspective (Demirbaş, Demirbaş 2019). For this reason, environmentally friendly and sustainable planning approaches should be adopted in the planned living areas, and strategies should be determined accordingly. The previous state of the area, its geographical location, ecological condition, etc. subjects should be carefully examined and the Project must be designed according to the carrying capacity.

In brief, what we suggest in this study is as follows:

- Effective use of open green areas,
- Having a water storage system for storing rainwater,
- Using solar panels oriented at energy saving purposes,
- Having tree species suitable for climatic conditions and area ecology,
- Periodical maintenance and repair of landscape areas by experts.
- Improving social security

Following the assessment on the biophilic criteria, Sinpaş Altınoran settlement area has been found to be meeting the related criteria with a ratio of 71% within the scope of using structural and plantal materials, including the spatial structure.

## REFERENCES

- Abbas, Z. Jawaid. M.F. (2017) Biophilia and Built Environment: An Implication for Healthcare Facilities. *International Journal on Emerging Technologies* 8(1): 628-634(2017) (Ankara Metropolitan Municipality, 2010).
- Alexander, C., Ishikawa, S., Silverstein, M., Jacobson, M., Fiksdahl-King, I., & Angel, S. (1977). *A Pattern Language: Towns, Buildings, Construction*. New York: Oxford University Press.
- Basson. (2014). *Exploring therapeutic architecture and the integration of addiction rehabilitation*. M.Arch. University of Cape Town.
- Demirbaş G. U., Demirbaş Ö. O. (2019). Biyofilik Tasarım Kapsamında Peyzaj Mimarlığı Ve İç Mimarlık Arakesiti: Eğitim Programlarının Karşılıklı Değerlendirilmesi, *Turkish Journal of Landscape Research*, 2:2, 50-60, Research Article.
- Geray, C. (1998). "Kentsel Yaşam Kalitesi ve Belediyeler", *Türk İdare Dergisi*, Aralık, Sayı 421.
- International Living Future Institute, 2017
- Kellert et al. (1993). The Biophilic hypothesis,
- Kellert et al. (2008). *Biophilic design: the theory, science and practice of bringing buildings to life*
- Kellert et al. (2015). The practice of biophilic design. *Journal*, [online], available at: <http://www.Bullfrogfilms.Com/guides/biodguide.Pdf>
- Ünvar, R. Küçükçiliç, E. Yerleşimlerde Yapı Yüzü Renk Tasarımına Yönelik Bir Yaklaşım Önerisi. *YTÜ, Mimarlık Bölümü*Cilt 379.
- Newman et al. (2015). Biophilic cities are sustainable, resilient cities. *Journal*, [online], available at: [www.Mdpi.Com/2071-1050/5/8/3328/pdf](http://www.Mdpi.Com/2071-1050/5/8/3328/pdf)
- Orman, P. (2017) *Understanding the Biophilia Hypothesis through a Comparative Analysis of Residential Typologies in Phoenix, São Paulo, and Tokyo*. Mater Thesis. Arizona State University
- Öztürk Dokuzer, L. (1992). "Kent Aydınlatma İlkeleri", Yıldız Teknik Üniversitesi Mimarlık Fakültesi, İstanbul.
- Ünal, A. ve Özenç, S., 2004, Aydınlatma tasarımı ve proje uygulamaları, Birsan, p
- Sarı, D. ve Karaşah, B. (2018). Bitkilendirme Tasarımı Öğeleri, İlkeleri ve Yaklaşımlarının Peyzaj Tasarımı Uygulamalarında Tercih Edilirliği Üzerine Bir Araştırma, *MEGARON*; 13(3): 470-479.
- Ramoie. (2014). *Biophilic design*. Bachelor of fine arts for interior design. The Illinois institute of art – Chicago
- Robinson, N. (2004). *The Planting Design Handbook*, 2. bs. Poole, United Kingdom: Ashgate Publishing Company.
- Sirel, Ş., 1992, *Aydınlığın Niteliği, Yapı Fiziği Uzmanlık Enstitüsü Yayını*, 4-10.