

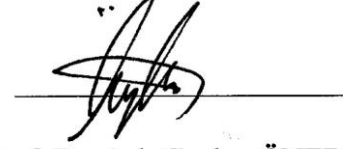
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Assoc. Prof. Dr. Devrim ÜNAY

Director I

certify that this thesis satisfies all the requirements as a thesis for the degree of  
Master of Sciences.



Prof. Dr. Ash Ceylan ÖNER

Asst.

Head of the Department of Architecture

This is to certify that we have read this thesis and that in our opinion it is fully  
adequate, in scope and quality, as a thesis for the degree of Master of Science.



Asst. Prof. Dr. Athanasios STASINOPOULOS

Supervisor

Examining Committee Members (Title and Name

in alphabetical order of last name)

Assoc. Prof. Dr. Erdem ERTEN



Assoc. Prof. Dr. Sölen Kİİ



Asst. Prof. Dr. Athanasios STASINOPOULOS



n

KİPÖZ

**IZMIR UNIVERSITY OF ECONOMICS  
GRADUATE SCHOOL OF NATURAL AND APPLIED  
SCIENCES**



**FACES OF BIOPHILIA IN CONTEMPORARY TURKISH  
ARCHITECTURE**

**NERGİZ AMİROV**

**A thesis presented in fulfillment of the requirements for the Degree  
of Master of Architecture**

**2017**

**ABSTRACT**

**FACES OF BIOPHILIA IN CONTEMPORARY TURKISH ARCHITECTURE**

AMİROV, Nergiz

M.SC. In Architecture

Advisor: Asst. Prof. Dr. Athanasios STASINOPOULOS

June 2017

This thesis reviews three types of greenery in recent buildings, on the ground level, on roofs and on facades, as contemporary cases of biophilia in the Turkish built environment, in order to appraise the interaction between local people and nature in the context of architecture. This research includes theoretical references and a collection of characteristic green examples in Turkey. To understand how people respond to green concepts, a survey will investigate how Turkish public relate with biophilia in their built environment today. Signs and elements shows us most of architectural examples include natural elements such as natural light, natural landscapes, water supply which are related with biophilia.

**Keywords: biophilic design, ecological design, sustainable design, living walls, green roofs, microclimate of city**

**ÖZ**

**MODERN TÜRK MİMARİSİNDE BİYOFİLİK ELEMANLAR**

AMİROV, Nergiz

Mimarlık Yüksek Lisans

Tez Yöneticisi: Asst. Prof. Dr. Athanasios STASINOPOULOS

Haziran 2017

Bu tez, son yıllarda zeminde, çatılarda ve cephelerde üç çeşit yeşil alan çeşitlerinin yanı sıra çağdaş biyofili vakalarını da inceliyor. Bu araştırma teorik referansları ve Türkiye'de karakteristik yeşil örneklerin bir koleksiyonunu içermektedir. İnsanların yeşil kavramlara nasıl tepki verdiklerini anlamak için bir anket çalışması yapılmıştır, Bu anket çalışması halkın bugünkü yapılı çevre koşullarında biyofili ile nasıl bir ilişki içinde olduğunu araştırıyor. İşaretler ve öğeler, doğal ışık, doğal peyzajlar ve su temini gibi elemanların biyofili ile ilgili doğal unsurları içeren mimari örneklerin çoğunu gösteriyor.

**Anahtar Kelimeler: biyofilik tasarım, ekolojik tasarım, sürdürülebilir tasarım, yaşayan duvarlar, yeşil çatılar, şehrin mikroiklimi**



*Mom and Dad,*

*I could never have done this without your faith, support, and constant encouragement.*

*Thank you for teaching me to believe in myself and in my dreams.*

*I dedicate this thesis to my family for their constant support and unconditional love.*

*I love you all dearly.*

## ACKNOWLEDGEMENTS

I would first like to thank my mama, papa and brother who are İrade Sultanova, Rauf Amirov and Ferid Amirov, without their continuous moral and material support and encouragement I never would have been able to achieve my goals in my life. They are so far away but they always deep inside of me. All I have are for you!

I wish to express my sincere thanks to Asst. Prof. Dr. Aslı Ceylan ÖNER. I am grateful for her deeply advices and motivation for being successful in my master degree.

Lastly, I would like to special thanks to my advisor, Asst. Prof. Dr. Athanasios STASINOPOULOS, for the patient guidance, encouragement and advices. I have been extremely lucky to have an advisor who cared so much about my work, and who responded to my questions enduringly. I will consult you till the end of my life, not done yet. *Спасибо Большое !*

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## CHAPTER 1

### INTRODUCTION

Biophilic design is a reflection of the word ‘biophilia’ which proposed by biologist E. O. Wilson in 1984. It refers to the human need for contact with nature and living species. Word of biophilia means ‘love of life’ which relate with both flora and fauna. This thesis focuses on the relation between living organisms and built environment (architecture) in Turkey. Living structure in our built environment, Wilson deliberated that biophilia is not only an aesthetic preference but also a major necessity for people similar to water, food and air. The name of biophilia is new but the concept is not. According to researches, in ancient Greece, hospitals and educational fields were set in natural surroundings. At the same time, in Ottoman architecture, mosque courtyards included gardens and green elements to support social and mental balance. Accumulated evidence shows that contemporary people generally spend their 90% of time in indoor to built environment. Green buildings is the need for spaces where human live in. The effects of having green elements in our built environment include a contribution to our mental health in a positive way and also an improvement of building performance such as in humidity control and improving heating and cooling conditions.

Biophilia is related with passion for nature. The human disposition is about turning back to Mother nature. We feel good in nature. In addition of that our physical and mental well-being depends on with the natural environment. Biophilic design struggles against the negative effects of urban overheating and improves the human physical and mental comfort to create a healthy human life. It has the ability to which to reduce stress, to aid recovery from illnesses and to raise academic performances. *“It affects our personal well-being, productivity and even relationships with others.”* (Ansbacher, 2000).

### **1.1. The Aim of Study**

The aim of the study is firstly to review of biophilia in the context of the contemporary Turkish built environment, making a distinction between greenery on the ground level, on the roofs and on the facades of building. At the same time, this study investigates how people interact with nature in urban conditions.

### **1.2. Research Questions and Hypothesis**

Research questions of this study are:

- firstly, how biophilic concept is applied in Turkish architecture from past to now,
- secondly, how it affects to local people and
- thirdly, why designers and developers decide to use biophilic elements in architecture.

According to these research questions, the following hypothesis can be developed; the hypothesis of the study is green elements can be applied to Turkish architecture with gardens, green roofs and living walls. The integration of the biophilic elements of water, vegetation, plants in both the exterior and interior areas in the built environment all contribute to our buildings powerful sense.

Another main hypothesis of this study is related with interaction between local people and greenery elements. The use of biophilic features is gradually increasing in Turkey. According to researches, natural and green elements have significant effects on people's physical and mental health, performance and well-being. In Turkey, more and more educational buildings, hospitals and common spaces are surrounded by biophilia nowadays. After these hypothesis we should assess why designers and developers decide to use biophilia. Throughout the World, the need for contact with nature continues to be critical because of rapid urbanization. At the rest of the world, Turkey is at a distressing environmental condition. For that reason, designers and developers prefer to use more greenery both systemic and sociological aspects.

### **1.3. The Methodology of Study**

The methodology of this study were literature review and then data and example collection. Biophilic examples from Turkey, which are supported by theoretical background, were also examined. The work continued with field studies for analyzing the interaction of people in terms of three types of green building features, then a questionnaire was presented to certain architects and designers for analyzing the underlying reasons that caused the application of biophilic elements in their designs.

#### **1.3.1. Literature Review**

The main aim of literature review is to provide an overview of the ideas, theories, and significant writings currently available about biophilia and in relation with architecture. Studies conducted within the scope of research questions have been examined. The main purpose of this is to examine the green integrated designs in Turkey and see how biophilia is assimilated in built environment.

#### **1.3.2. Data/Example Collection**

This method has been chosen to analyze and understand biophilic studies on architectural field in Turkey. In this research two main data collection methods were used quantitative and qualitative data collection. The former relied on random sampling and structured data collection instruments to produce results that are easy to summarize, compare and generalize. Qualitative data collection methods were used to clarify quantitative evaluation findings and strengthen the design of interview questions.

### 1.3.3. Case Studies

A general knowledge base was established with literature review. Within the case studies, two different regions were selected from Turkey. These areas have been chosen in order to understand how biophilia is perceived and applied in different parts of Turkey. Surveys conducted in these areas revealed the approach of local people to biophilia.

## CHAPTER 2

### THE NOTION OF BIOPHILIA

#### 2.1. What is 'Biophilia'?

Sorrento (2012) states that *the word 'biophilia' was first used by the famous psychologist called Erich Fromm in 1964. He described it as "the passionate love of life and all that is alive". The concept was popularised by Edward O Wilson, an American biologist in 1984 with his book 'Biophilia'. He defined it as "the urge to affiliate with other forms of life"*. The term biophilia may be a relatively new one, but the concept is not. From past to now, people generally use green elements in their homes and urban areas. During the time, we have major transformation between personal areas and natural world. At that time, our homes are integrated with our natural elements. Because of that, interiors are influenced by nature and properties of natural environments. Biophilic design is generally about nature and natural elements which are related with materials and forms in the built context.

Living structure in our built environment is, Wilson (1986) deliberated, that biophilia was not only aesthetic preference but also major necessity for people such as water, food and air. . Evidence accumulates shows that contemporary people generally spend their 90% of time in indoor built environment. Greenery in environment is the need for spaces where human live in. An explanation of why we prefer to have green

elements in our built environment includes to contribute our mental health in a positive way and also improving building performances such as humidity and optimizing the heating.

Kellert (2005) argues that the idea of 'biophilia' is related with an understanding of human evolution, where for more than 99% of our species history we biologically developed in an adaptive response to natural not artificial or human created forces. Researches show that human body and human mental want to contact with nature. The human body, mind, and senses evolved in a bio-centric not human engineered or invented world.

According to Salingaros (2015), there are two main strands of conjecture help to explain the biophilic effects on human that inherited memory and biological structure of human being. First source of the biophilic effect that instinctual is thought to come from inherited memory from human evolution and development in our environment. The environment composition of open grazing land, trees, sunlight, water, animals, floras, etc. Our ancestors relied on information which was emanated from these natural elements and nature. We firstly became human in that setting, with its geometrical and environmental qualities genetically encoded into us. The second important source of biological structure is that geometrical rules of biological forms with which we share common patterns. There are parallel relations between living mechanism and basic organization of biological systems. The concept of 'biophilia' shows us the common points of geometrical properties and elements of landscape with complex structures. From past to now, researches pointed that human sensory organs and systems which are evolved to respond natural geometries and natural reactions which are qualified with scaling, symmetrical formation, colors and fractals. Our biophilic instincts are affected by positive aspects (food, nature, friends) more than negative aspects (threats) in the environment. Human perceptual systems generate positive emotions from surroundings.

Samuel and Sarah (2009) explain that biophilia is related with passion of nature. The human disposition is about turning back to nature. We feel good in nature. In addition



of that, our physical and mental well-being depends on the natural environment. Biophilic design struggles the negative effects of urban zone heat and improves the human physical and mental comfort to create a healthy human life. It has abilities which to reduce stress, to aid recovery from illnesses and to raise academic performances.

As mentioned by Jones (2008), designers usually deal with design problems about complex interiors and urban space projects. However, in the past 25 years and in the developing world, designers have new design problems related with the creation of built environments that should provide health and well-being for current and future generations who live and work in the ecologic spaces. In the near future, we will not have lots of green spaces in our cities because of urbanization. However we have a chance to create much greener spaces in our common areas and also interiors. Humanity is related with nature. For that reason, interiors which are used by common purposes should provide health and natural ecosystems.

In addition to such ideas, Locklear (2012) states that from past to now, humans use all natural resources in their life and in their spaces. Using concepts of biophilic design to guide the decisions for the built environment, spaces are designed to support healing through with biophilic responses and connection to natural elements and systems. In the present times, we have bigger spaces but their materials do not promote our positive psychology and well-being physical conditions. In relation of that, interiors should be integrated with nature.

Referring to the benefits of biophilic design, Almusaed (2011) states that biophilic design assists us to optimize comfort and reduce energy depletion. The main benefit of this design ideology is designing new buildings and interiors with economical, social and ecological considerations. The concept is include durable materials for providing consumption and creation of healthy elements.

Green area concept can improve both building functions and human health by utilizing natural energy sources, fresh air, getting us closer to nature and also releasing us from the stresses of city life.

*“Since then, the biophilia hypothesis has been applied to many areas of life, including mental health”* according to White & Heerwagen (2013). This is largely due to refinements in the theory by researchers like Wilson & Kellert (1993). Wilson stated that *biophilia was a complex set of learned behaviours and processes based on our connection to nature. These learnings are split into biophilia, which are positive learnings and ‘approach’ behaviours and biophobia which are negative learnings with ‘avoid’ behaviours (Ulrich, 1993).* Wilson claims the opposite of writers like Fisher (2003) who believes that our connection to nature is replaced by technology, but argues that our biophilic feelings atrophy and are integrated into our cultural systems as exemplified by zoos and nature based attractions. *In terms of its application to mental health, the ability to live, think and learn healthily and live with ones emotions and the reactions of others in a consistent manner (Herman et al, 2001), in contemporary society is clear; biophilic and biophobic tendencies are a marker of culture (Wilson, 1993) and if we take the assumptions made by various commentators (Foucault, 1964; Horwitz, 2002; Rind & Yuill, 2012) that mental health is a product of its culture, the connection is clearer still.* The problems of mental health are shown to be increasing the world over (Desjarlais et al, 1995), *whilst biophilia as a hypothesis can answer this to a degree, it provides many other answers, namely to do with the origin of many of these conditions that we are experiencing.*

### **2.1.1. In Terms of Fauna**

Why is the presence friendly dog stress-reducing? One possibility is that such presence functions as an *“attachment figure”* to convey security and safety. This suggests that attachment theory may be a broad enough *“canopy”* to encompass domestic animals as attachment figures for humans, and vice versa. Researchs provide evidence that animal presence (not only dogs but also rabbits and other small furry creatures)

facilitates human social approach and interaction for children and adults, both with (Mader, Hart, & Bergin, 1989) and without disabilities (Hunt, Hunt, & Gomulkiewicz, 1992). Together, these research directions suggest that human interactions with animals, particularly pets, affect human well being and functioning. (Fig.1)



Figure 1. A girl feeding cats / İstanbul

Since pet animals and other animals are pervasive in the environments of human beings, these principles logically lead psychologists to examine human and animal relationships as an interdependent system. (Melson, Gail F., 2002)

It is widely believed that people have an emotional need to connect with animals, which manifests itself in, for example, caring for the environment (Vining, 2003) and visiting zoos (Myers, Saunders, & Birjulin, 2004). Perhaps the most explicit formulation of this idea is the “biophilia” hypothesis of Edward Wilson (Wilson, 1984, 1993), where biophilia summarizes our “*innate tendency to focus on life and life-like processes*”. In this hypothesis, human dependence on nature goes beyond a physical

dependence, and also includes aesthetic, intellectual, cognitive and spiritual satisfaction (Kellert, 1993). This hypothesis has been widely applied, for example in interpreting the health benefits that come from connecting with nature, children's responses to pets and the natural world (Fawcett & Gullone, 2001; Kahn, 1997), and the enjoyment people gain from visits to the zoo (Fraser, Gruber, & Condon, 2007).

According to Melson and Peet, attachment to pets is related to positive emotional functioning. A strong attachment may have a positive impact on anxiety (Serpell, 1991). Pets might increase the survival rate of people who had experienced coronary artery diseases (Friedman et al, 1980). But to date evidence for a direct beneficial effect of pet ownership on human health is inconclusive and data would need further replication. Overall, dog owners tend to present less minor health problems than non owners. It may be because they do more recreational walks, which might be the cause (Brown and Rhodes, 2006).

There are a number of writers who proclaim the effectiveness of biophilic elements in treatments (Melson & Fine, 2010) *“such as plants added to settings or animal integration, often at the same time. For this particular application of the biophilia hypothesis there is an effort to make evidence empirical, with well documented studies taking place as opposed to previously mentioned anecdotal evidence”* (Fine, 2010).

A primary example of this is Melson's (2001) study into 'dearousal' of stress and anxiety patients. In the study he used therapeutic interviews combined with playing with or watching animals. Melson found that *“the animal influences allowed for the levels of stress of anxiety to decrease in the individuals, whilst also allowing them to learn positive nurturing techniques to apply to themselves as calming mechanisms”* (Melson, 2001), and suggested that *“this is at least in part to do with our affiliation to positive animal influences (such as using dogs for hunting) in our biophilic past.”* Other researchers have confirmed the 'dearousal' concept, even before Melson.

Golletz (1995) showed that *“biophilia helped to induce relaxation through a 'passive positivity' from natural stimuli, in this case being pictures and sound effects pitted against verbal relaxation or silent 'resting'.”* The nature stimuli used by Golletz (1995)

allowed for a measurable reduction in anger and anxiety through self-reporting methods, showing a perceived difference in natural to human based stimuli, at the very least.

With this in mind, Gullone (2000) points out that *biophilia allows us to consider our mental health in a more complex way and as such think of more cures, but it has wider implications for the amount of pathologies that are now open to diagnosis (Gullone, 2000), which leads us to the second implication of biophilia on our mental health.*

### **2.1.2. In Terms of Flora**

The experience of nature across evolutionary time periods has left its mark on our minds, our behavioral patterns, and our physiological functioning. We see the ghosts of our ancestors' experiences in what we pay attention to in the environment, how we respond, and what the experience means to us. The biophilia hypothesis and supporting research tells us that, as a species, we are still powerfully responsive to nature's forms, processes, and patterns (Kellert & Wilson 1993, Kellert et al. 2008).

Related with this as mentioned in Heerwagen (1998), nature is beneficial to all, regardless of age, gender, race, or ethnicity and it should be available to all urban dwellers, not just those who can afford to live on the edges of parks and open spaces. Connection to nature on a daily basis reinforces the values of respect and care for the environment that are necessities for sustainable communities. Spaces with dead and dying plants and trees signal habitat depletion and are largely avoided. In contrast, places with rich vegetation, flowers, large trees, water, and meandering pathways that open suddenly to views are sought out by many as places of relaxation and enjoyment. These features characterize the most beloved urban parks and arboreta across the globe. But even small spots of nature—a flower pot, tree, or a small garden—also delight. That is the real story of our connection to nature—it has many faces and many

ways to create positive experiences in our homes, offices, backyards, or common spaces.

The increase of living walls in the built environment provides the healthy environment and habitable spaces in our interiors. Green areas encourage people for thinking positive. And that time, this is important relation between humanity and nature in relation of complex areas ( Loh, 2008).

*“Ecological design provides a coherent framework for redesigning our landscapes, buildings, cities, and systems of energy, water, food, manufacturing, and waste. It is simply the effective adaptation to and integration with nature’s processes. It proceeds from considerations of health and wholeness, and tests its solutions with a careful accounting of their full environmental impacts. Places with rich vegetation, flowers, large trees, water, and meandering pathways that open suddenly to views are sought out by many as places of relaxation and enjoyment.” Ryn (2007)*

Maas et al. (2009) concluded that green space in people’s living environment is generally associated with enhanced feelings of social safety, and that this relationship is concurrent with the positive relationship between green space and people’s health that has been found in the literature.

Kuo et al. (1998) and Kuo and Sullivan (2001) present research demonstrating that exposure to trees in urban settings can foster a sense of safety and reduce crime rates, thus contribute to social well-being.

## CHAPTER 3

### BIOPHILIA IN ARCHITECTURE

#### 3.1. Biophilia in History of Architecture

According to Kellert, while humans evolved over the millennia, their relation to the environment likewise changed. People depend on their surroundings for both natural resources and for enabling the establishment of community. As creatures of the earth, humans respond to its natural features, which can also be incorporated into constructed design. The modern history of architecture is characterized by building movements and styles, often imposed by an elite few who deemed this or that approach as “good” architecture. The rigid geometry of Modern Architecture, for example, holds few relationships to the outside world. Conversely, “*great architects in the past were better able to discern those qualities, and to reproduce them in their buildings because they were more engaged with their immediate surroundings.*” As a consequence, buildings provided protection with the benefits of natural elements. The premise of biophilic design “aims not only to reduce the harm that stems from the built environment, but also to make the built environment more pleasing and enjoyable. It seeks both to avoid and minimize harmful impacts on the natural environment, as well as to provide and restore beneficial contacts between people and nature in the built environment.” (ibid). Architecture in and of itself is not harmful, and its benefits of shelter and community cannot be overlooked. However, built environments can certainly cause stress. Biophilic design provides the answer to this predicament, preventing harm to both people and nature while facilitating a beneficial link between the two. (ibid).

Too often, a distinction has been made between architecture and environment, cutting people off from a psychologically-developed need to commune with nature. When architects overstep their role, using *“images and surface effects”* to *“supplant everyday human desires and sensibilities in the name of artistic endeavor, humans are left to live out their lives in a series of ill-fitting, overexaggerated and often idiosyncratic formal architectural schemes.”* Biophilic design does not advocate tree houses or cave-dwelling, but it does provide the nature-based features that prompt complex thinking in humans. Though not technically biophilic design, the nature-communing architecture of Frank Lloyd Wright’s Fallingwater arguably speaks to the human soul much more than a box-like “machine for living” by Le Corbusier. Not an architectural style, biophilic design must avoid becoming such. Designers can often become caught up with the potential of new technology, pushing its limits but not in the service of its users. Because of these risks, the “green” aspect of biophilic design must not overwhelm its overarching goals of creating an ideal environment for people (Kellert et al, 2008).

Biophilic design affords humans a host of benefits. Using particular landscapes can reduce stress and enhance well-being because we gravitate toward certain configurations and natural contents. These landscapes were the environments prehistoric people inhabited throughout their evolution, and the human brain adapted to respond to these types of spaces. In built environments, we have obstructed the connection developed over millennia. We are so accustomed to our built habitats that we do not notice their deleterious effects, and as a result, stress has become a chronic issue in modern society. Eliminating some of the distinction between built and natural allows biophilic design to impart the benefits of both types of environments (Joye, 2007).

One usually associates crowded urban spaces with modern urban developments, but the complexity of accommodating living environments in highly populous cities dates back to Roman times. City dwellers were isolated from exterior views and natural settings. A strong interior focus was necessary to create a successful living space and



reintroduce natural elements into the house plan. Two architectural features anchored the public and private areas of the Roman domus. (Leakas,2008)

The atrium and the peristyle solved the need to introduce central light sources into the interior. The atrium's compluvium (roof opening) flooded the space and surrounding rooms with daylight. Located behind the street entry of the domus, the atrium served as a public space to conduct business and entertain associates. It showcased the family's wealth and importance in society. The impluvium was another central feature of the atrium. The purpose of the impluvium was to collect rainwater and occasionally channel it into a water cistern below the floor. The reflection of passing clouds and changing sky patterns on the water's surface may have partially compensated for the lack of windows in the house. The atrium served as a central circulation area for the perimeter rooms and as a transition zone between the public and private areas of the home. (Leakas,2008)

### **3.2. Biophilia in History of Ottoman Architecture**

According to Omer *“Islam teaches that environment is part of the universal web of creation. Islamic unique perception of man and his position on earth necessitated the formation of a compelling and comprehensive view of the natural environment as well. This is so because man totally depends on nature for his survival. Also, nature is a ground for man's realization of his spiritual purpose on earth. Simply put, man is an integral part of the total natural setting. Man is nature himself, sustaining nature means sustaining his self, damaging nature means damaging his self and his prospects of a civilizational triumph.”*(Omer, 2009)

From its early era, Islam reflect the idea that human beings belong to nature. This idea is the base of using nature in architecture. Parker & Richards rightly observed that *“The implications of the concept of man as the vicegerent (khalifah) and his interaction with nature for architecture are both ideological and practical. To begin with, humans are not the only creatures that build. Many a creature that we classify low down the hierarchy of the animal kingdom, such as bees and ants, build elaborate*

*structures. However, it has been suggested that it is awareness and imagination that single out humans as superior to other animals in architectural output.”*

Islam promotes the idea of preserving human and their wellbeing, mental and physical health through respect to nature. Relevant Islam inscriptions of multiple sizes were generally used by the Ottomans in many cases, especially in architecture and urban design. At the core of the identity of Ottoman architecture lies the concepts of human and the nature (environment). According to researches, architecture and natural environment was inseparable in Ottoman architecture. Some important signs and elements shows us most of architectural examples include natural elements and some indirect experiences of nature such as natural light, natural landscapes, water supply which are attributes of biophilia. For example, the great architect Sinan built lots of building and also he designed urban areas. In that relation, Saoud mentioned: *“His constructions created harmony between architecture and landscape, a concept, which did not surface in Europe until 16th century. His choice of site, magnitude, form, and material of his buildings were employed as ingredients enhancing the beauty of the overall image of the city.”* (Saoud, 2007)

Besides the architecture, there are many urban design examples, which designed by the Ottomans, such as gardens and parks (mesire). As mentioned by Atasoy *“Ottoman gardens, quite naturally, are thought of first within the general framework of Islamic gardens. Ottoman gardens were not strictly formal, neither were they disorganized. Ottomans sought practical solutions that suited the topography, dimensions, climate, and in general, the ambient conditions of the garden’s location rather than adhering to a particular set of fixed rules, and their first principle was to integrate gardens with nature. They enriched and embellished what nature already provided, creating gardens wherever running water existed rather than building watercourses, and planting trees and installing flowerbeds so as to preserve the appearance of natural development of the setting.”* (Atasoy, 2007)

There are some important palaces and privy gardens as biophilic examples that the Ottomans created in different places such as Topkapı Palace, Dolmabahçe Palace and urban design of Kağıthane (mesire). As reported by Aksoy (2013), said about

features of Topkapı Palace : *“In the period from the conquest of Istanbul to the beginning of the Tulip Revolution (1976), a significant development of the Garden Art has standed out. Topkapı Palace is one of the most considerable trace of this period. Also, Topkapı Palace is one of the biggest palaces of the world. The palace has five atrium gardens which come into monumental value like constructions in times. For this reason, they are a part of the historical, cultural landscape and architecture of Istanbul. Palace gardens have a complex feature, functionally and aesthetically, which is coming from the design of the herbal and architectural elements, either combined or distinct. They also have a form of documentary as they reflect the concept of outdoor life of the past, and bring it so far.”* (Fig.2&3)



Figure 2. Topkapı Palace / İstanbul



Figure 3. Gülhane Park near the Topkapı Palace / İstanbul

The same author further remarked: *“Turkish gardens can be subdivided into two categories. The first group is made up of large-scale green areas like vegetable gardens, parks for public recreation (mesire), and meadows. As for the second group, it is made up of small and enclosed areas like house, mansion, and palace gardens. As time went by, the Dolmabahce Palace Gardens, which we could define as being an aesthetical manifestation in the guise of historic parks and gardens of the sociological environmental development, acquired a value as a monument, exactly as if they had been buildings, and in this way they became part of Istanbul’s historical and cultural landscape and heritage. The Dolmabahce Palace Gardens, which have complex characteristics from both functional and aesthetical points of view, resulting from the integration of botanical and architectural elements, have acquired a documentary characteristic in that they express and transfer to our day in a concrete way the conception of outdoor life of the past.”* (Aksoy, 2011) (Fig.4)



Figure 4. Dolmabahçe Palace Garden / Istanbul

Cerasi states that: “D’Ohsson recounts that the main parks and mesire belonging to the Sultan or to the other members of Court were opened to the public on certain days of the week. This would explain in the modest extent of the gardens immediately pertaining to the imperial kiosks and the open volumetric arrangement, without any precise zoning, of the ‘parks’ as a whole. Each complex is surrounded by open spaces arranged in a summary or naturistic form so that they participate both in the town’s ‘public’ space and in the complex itself. Kağıthane (the ‘fresh waters of Europe’) is an exemplary case for the social and cultural history of the Ottoman.” (Cerasi, 1985) (Fig.5)



### 3.3. Biophilic Design in Recent Architecture

Humanity is related with nature. For that reason, interiors which are used by common purposes should provide health and natural ecosystems. From past to now, humans use all natural resources in their life and in their spaces. Using concepts of biophilic design to guide the decisions for the built environment, spaces are designed to support healing through with biophilic responses and connection to natural elements and systems. In these times, we have more big spaces but their materials do not promote our positive psychology and well being through physical conditions. To achieve that, interiors and architecture should be integrated with nature.

Biophilic design enables us to provide comfort and lessen levels of energy depletion. The main benefit of this design ideology is designing new buildings and interiors with economical, social and ecological idea. The concept of include durable materials for providing consumption and creation of healthy elements. Green area concept can improve both, the building functions and human health with natural energy sources, fresh air, getting closer to nature and also release from the stresses of the city.

This author believes that biophilic design includes two main elements; *organic* design and *vernacular* design which is place-based design. Organic design is concerned about usage of shapes, forms and materials in buildings and landscapes in relation of directly or indirectly. This design type effects the use of natural lighting, water, ventilations and also materials. In biophilic design water and ventilation are most important things because of nature.

The aim of biophilic design is creation of nature in interior spaces. Vernacular design refers to buildings or interior spaces that design in connection of culture, history and ecology with geographical aspects. Related with these aspects, we can clearly say that

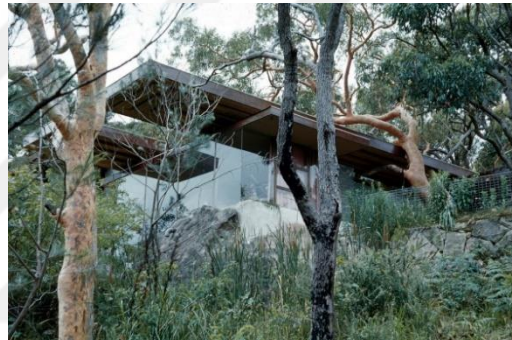


natural lighting, natural ventilation and using natural materials which are used natural forms are common expressions of organic architecture and biophilic design. These features can be result of design decisions such as large operable windows, light shelves and buildings orientated to the sun and prevailing winds.

Natural lighting and ventilation are basic properties of natural environment. For that reason the building itself and its interior should be connected with natural elements. That connection affects the architectural field because building and its environment totally related with each other. Other natural features that can be designed into buildings and constructed landscapes include plants, soil, water, geological forms and even fire or animal life. There are some examples of biophilia in designing. These are shown in Figure 6 and Figure 7.



*Figure 6. One Central Park*



*Figure 7. Muller House, by Peter Muller*

Quoting from “Biophilic City Design” (2013): “*Biophilic cities are typically high-density urban population that exhibit a vast amount of natural elements and greenery in a deliberate attempt to make the metropolis natural and restore the area’s biodiversity. The use of rooftop gardens, hiking trails, trees, flowers, and wildlife all amount to the deep connection urbanites feel with nature leading to environmental awareness and responsibility.*”

From an economical point of view, “*biophilic cities invest large amounts of money and resources to ensure that urban nature is protected and respected among all local*

residents. Nature programs and environmental initiatives are also typically implemented as part of the education process of biophilia. Oslo the capital city of Norway is the leader in biophilic design and biodiversity conservation. With eight rivers running through, the urban setting city planners have worked to preserve a large number of parks and green spaces. The city itself is surrounded by hills and forests so the urban density must be planned and accommodate carefully to maintain the natural setting. This is why it is referred as a compact city.” (ibid) ( Fig. 8).

Another example of a city that has decided not to continue sacrificing nature for urban expansion is Singapore. “Though the city has grown rapidly in population, planners have done an excellent job of incorporation Park Connectors, protecting nature and wildlife, and designing landscaped gardens and nature reserves. They also offer their residents great community garden options as well as opportunities to install green roofs and walls. Singapore is also home to the high-tech vertical vegetable farm, Sky Greens which collaborates with students from the Science Centre Singapore.” (ibid) (Fig.9)



Figure 8. Oslo, Norway



Figure 9. Singapore

Beatley (2016) stated that “support for the practice of biophilic design has been growing and there are now many examples of buildings that seek to integrate natural features and qualities. Designers recognize the need for biophilic workplaces, healing



*gardens and spaces in hospitals, and homes and apartments that provide abundant daylight, natural ventilation, plants and greenery. Less attention has been focused on the city or urban scale, despite the fact that the planet continues an inexorable trend in the direction of urbanization. Urban residents need nature more than ever, and much work is needed to find creative and effective means for incorporating it into urban environments.”*

The same author mentions that *“it is likely that the benefits of close contact with nature are deeper and even more profound than we realize, and the potential to make a difference by integrating nature directly into our lives, even greater.*

*Nature ought not to be an afterthought, and ought not to only be viewed in terms of the (considerable to be sure) functional benefits typically provided (benefits of trees, green rooftops, wetlands for managing stormwater, for mediating air and water pollutants, for addressing urban heat island effects, and so on).”*

He adds a list of items that should be recognized as *“elements of a deeper concept of integrating nature into everyday living”*:

***Important Ties to Place:*** *There are considerable place-strengthening benefits and place-commitments that derive from knowledge of local nature, including: direct personal contact, enhanced knowledge, deeper connections, greater stewardship, and willingness to take personal actions on behalf of place and home;*

***Connections and Connectedness:*** *Caring for place and environment, essential for human wellbeing and in turn an essential ingredient in caring for each other;*

***A Need for Wonder and Awe in Our Lives:*** *Nature has the potential to amaze us, stimulate us, and propel us to want to learn more and understand our world fully; nature adds a kind of “wonder value” to our lives unlike almost anything else;*

***Meaningful Lives Require Nature:*** *The qualities of wonder and fascination, the ability to nurture deep personal connection and involvement, and visceral engagement*

*in something larger than and outside oneself, offer the potential for meaning in life few other things can provide. (ibid)*

According to planning, he pointed that *“urbanists and city planners have special opportunities and unique obligations to advance biophilic city design, utilizing a variety of strategies and tools, applied on a number of geographical and governmental scales. The agenda is one that must extend beyond conventional urban parks, and beyond building-centric green design. It is about redefining the very essence of cities as places of wild and restorative nature, from rooftops to roadways to riverfronts. It is about understanding cities as places that already harbor much nature and places that can become, through bold vision and persistent practice, even greener and richer in the nature they contain.” (ibid)*

**List 1** is from Beatley (2011), showing some of the more important dimensions of biophilic urbanism or biophilic cities, and some possible indicators or beginning ways to think about urban metrics. The table makes clear that the physical qualities or attributes of a city, how green or natural the city is, is but one dimension.

### **List 1. Some Important Dimensions of Biophilic Cities**

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#### 1- Biophilic Conditions and Infrastructure

- Percentage of population within a few hundred feet or meters of a park or greenspace.
  - Percentage of city land area covered by trees or other vegetation.
  - Number of green design features (e.g. green rooftops, green walls, rain gardens).
  - Extent of natural images, shapes, forms employed in architecture, and seen in the city.
  - Extent of flora and fauna (e.g. species) found within the city.
- 

#### 2- Biophilic Behaviors, Patterns, Practices, Lifestyles

- Average portion of the day spent outside.
  - Visitation rates for city parks.
  - Percent of trips made by walking.
  - Extent of membership and participation in local nature clubs and organizations.
- 

### 3- Biophilic Attitudes and Knowledge

- Percent of residents who express care and concern for nature.
  - Percent of residents who can identify common species of flora and fauna.
- 

### 4- Biophilic Institutions and Governance

- Priority given to nature conservation by local government; percent of municipal budget dedicated to biophilic programs.
  - Existence of design and planning regulations that promote biophilic conditions (e.g. mandatory green rooftop requirement, bird-friendly building design guidelines ).
  - Presence and importance of institutions, from aquaria to natural history museums, that promote education and awareness of nature.
  - Number/extent of educational programs in local schools aimed at teaching about nature.
  - Number of nature organizations and clubs of various sorts in the city, from advocacy to social groups.
- 

*Source: Adapted and condensed from Beatley, 2011*

In relation of creating the biophilic cities, some countries and governance started to change their face of countries. There are many problems that affect human life and urban zones such as traffic problems, use of public areas etc. Some examples help us understand that the problems and how they should solve when countries consider the biophilia and ecological way.

First example is competition that aimed solve traffic problem of Mumbai in terms of using both creating more green areas and optimizing the urban zone. Vinnitskaya (2013) mentioned that Mumbai, like many populous modern cities, has a traffic problem that may better be categorized as a traffic nightmare. At the Kala Nagar Junction, where five main traffic arteries merge to connect nearly 60,000 commuters per hour from the Island City to the western suburbs of Mumbai, the BMW Guggenheim Lab and Mumbai Environmental Social Network launched a competition to search for realistic solutions to the infrastructural tangle. Likely designed when traffic congestion was not as severe, the Kala Nagar Junction is no longer capable of accommodating the daily commuter demand. The competition, open to students and professionals, called on participants to consider solutions that not only resolved the traffic problems, but also produced public spaces and safe pedestrian routes. Lots of participants developed proposals that isolates moments on various elevations at the junction. Traffic moves on the ground and via underpasses. Dedicated public transportation routes line the periphery of the roads with easy access for pedestrians. Footpaths and a promenade bring pedestrians from outside the junction to the center where connections to proposed green spaces and anticipated public infrastructure and commercial areas that can further develop the site into a community spaces.

Other important example is High Line in New York. When some infrastructures has abandoned, these spaces could be considerable sites for urban planners and designers in terms of creating people-friendly and communal spaces such as abandoned railways, historic bridge and empty building or industrial sites.

According to Justiniano New York's High Line – a park that runs along the lower west side of Manhattan for 1.45 miles (2.33 kilometers). Once an elevated railway, it went out of use in 1980 and was facing demolition until a non-profit group came up with the idea of preserving the structure and reusing it as a public park. Now owned by the City of New York this project has been a facelift for the neighborhood and attracts many visitors from the entire world (3.7 million in 2011). What is important about the High Line is that it communicates a powerful message about the importance of creating public spaces for the people. (Justiniano, 2014)

About creating natural landscapes Calabrese (2015) mentioned that natural landscapes and ecosystems consist of interconnected plants, animals, water, soils, rocks, and geological forms. People tend to prefer landscapes with spreading trees, an open understory, the presence of water, forested edges, and other features characteristic of a savannah-type setting important in human evolution. Still, even ordinary natural scenery is preferred by most people over artificial and human-dominated landscapes. The experience of self-sustaining ecosystems can be especially satisfying. Functional ecosystems are typically rich in biological diversity and support an array of ecological services such as hydrologic regulation, nutrient cycling, pollination, decomposition, and more. Self-sustaining ecosystems in the built environment can be achieved through such design strategies as constructed wetlands, forest glades and grasslands; green roofs; simulated aquatic environments; and other means. Contact with natural systems can be fostered by views, observational platforms, direct interaction, and even active participation.

### **3.4. Principles of Biophilic Design**

Leakas (2008) states that the main framework of this design idea is rhythm of the global environment. Starting point of the biophilic design and also ecological interior design is understanding the possible origin of the human needs. During the time, the needs of humans are changing. However, the general knowledge should be related with the analyzing the habitats and culture.

*“Evidence of the emotional and psychological benefits of nature is really impressive that research shows its ability to reduce stress, to aid recovery from illness, to enhance cognitive skills and academic performance, and to aid in moderating the effects of ADHD, autism and other childhood illnesses. Recent research suggests even that we are more generous in the presence of nature; all these values are in addition to the immense economic value of the ecological services provided by natural systems.”*

Biophilic concepts extend beyond the walls of buildings and can include site planning, community and land use planning issues as well. According to bad urban renewal examples, *society is shifting back to wanting a balance between urban living and natural surroundings. The biophilic cities are leaders in this respect and showing all of us what it takes to promote urban sustainability.* Humanity have nature and nature solve all problems in own way. If people become conscious about these subjects, our interiors, buildings and our public spaces would be more substantive and sustainable. Nature embody the city, shaping the relation between city and air, earth, water and other living organisms. Cities should become the most environmentally-friendly model for inhabiting our earth. It is more important than ever to re-conceptualize existing cities and their systems of infrastructure, to be compact, mixed-use and polycentric cities. Concept of biophilic city is all related with that ideas. Humanity should start the changing from micro to macro spaces. Designers start to change our interiors over the years in terms of being natural and biophilic. We should concern about our urban zones because we share these areas. Term of ‘biophilic city’ is not just explain the city that has bio-diversity or protecting green areas. At the same time, terms of biophilic city is the city that adaptable with nature and natural systems, inspired by naturalist approaches and also the city that repair the values which are lost during the process of urbanization.

Ryn (2007) states that biophilic design is also related with sustainable design because of providing more natural lighting, fresh air and natural materials. Base of the biophilic design idea, the main important thing is re-connect the built environment with nature which are provide with daylight, air, plants and green spaces. This design idea, in all design periods, generally used in working spaces, healthcare environments and in early-age spaces such as work offices, hospitals, kindergartens and schools. There are lots of significant points for designing with biophilic idea such as increasing the productivity in workers, improvement in learning rates in students and also reducing the stress and energy both people and structures. As mentioned in Almusaed (2011) the concept of biophilic design is absolutely related with sustainable building and sustainable materials. It considers bio-ecologically harmless materials and the using of

the renewable natural energy resources and huge increase of quality in planning and using with the idea of comfortable living.

Related with these information Kellert (2005) states that biophilic design includes two main elements which are organic design and vernacular design which is place based design. In organic design way concern about using of shapes, forms and materials in buildings and landscapes in relation of directly or indirectly. This design way effect the use of natural lighting, water, ventilations and also materials. In biophilic design water and ventilation are most important things because of nature. The aim of biophilic design is creation of nature in interior spaces. Vernacular design refers to buildings or interior spaces that design in connection of culture, history and ecology with geographical aspects.

### **3.5. Pros & Cons of Biophilic Design**

Biophilic design promotes the idea that direct access to nature can offer stress prevention, mental relaxation and productivity increase. Natural daylight is the most important thing in this design. Biophilic design is not related with a design concept aiming to improve the appearance of our interiors. The most important point is the our psychological health. Currently, lots of interior architects and designers aim to connect between nature and buildings. For that reason, they want to solve some problems about urban areas and connection between public and habitat areas. Several contemporary buildings have green features like living walls and other elements. Applying the meaning of biophilia, designs include the idea of that re-connection of the built environment with nature throughout the specific ideology of biophilic strategies. Almusaed (2011) states that the connection with nature create positive responses in terms of human performances and emotional states. For bioclimatic developments, the main important thing is human comfort. For providing the human comfort, firstly concept should interact the human health and spiritual well-being. The base of the mental comfort of humans is using natural resources accurately such as sun, water and air.

Derr and Lance (2012) state that there are some spaces and interiors which are need to be much greener. The base of the thinking of biophilic design is to provide healthy and well-being spaces for humans. For the thinking of combining nature and interiors, designs should involve greener and connective spaces. For that reason, one of the most important spaces are children's environments such as schools, kindergartens and playing areas in urban or interior spaces. There are some important points for childhood development that affect their lifes, which are sensory richness, colors, smells and visual sensations. A growing body is connected with nature because of early connections.

*“Biophilic design has often been regarded as a luxury for employers who want the best possible workplace for their employees, or who want to showcase their efforts to be more environmentally responsible. In reality, improving employee well-being through biophilia can impact productivity costs and the bottom line. In fact, productivity costs today are 112 times greater than energy costs in the workplace.”* (Biophilia and Workspace Design, 2012) As mentioned in Heerwagen (1998), biophilic design has effective facility is one that positive impacts in working performances, well-being and health. Ecological or green interior design improve working performances because it affects of human psychology. A place where designed biophilic design ideology has effective settings such as big sky, green and natural comfort. It relates the natural elements such as large trees and plants, water features, daylight and multiple view corridors. Performance is related with three main factors which are ability, motivation and opportunity. Office designs should have positively effect the ability by providing comfortable ambient conditions. Generally the main important problem is discomforting in office design. Biophilic design prevent these discomfortable affects with natural elements because humans feel safe in nature.



## CHAPTER 4

### BIOPHILIA IN BUILT ENVIRONMENT

#### 4.1. Greenery and Buildings

Kellert (2005) argues that *“the practice of biophilic design involves the application of varying design strategies, what we refer as experiences and attributes. The choice of which design applications to employ inevitably varies depending on a project’s circumstances and constraints including particular building and landscape uses, project size, varying economic, logistical and regulatory factors, as well as cultural and ecological conditions. People tend to prefer landscapes with spreading trees, an open understory, the presence of water, forested edges, and other features characteristic of a savannah-type setting important in human evolution.”*

In terms of rapidly increasing population, urban planners and architect worked on to protect nature and wildlife and designing landscaped gardens and nature reserves. They also offer their residential zones community gardens as well as install greener roofs and living walls. In addition of these implementations, city provide the vertical

vegetable farms. These greenery concepts provide the human health and well-being. Biophilic concepts extend beyond the walls of buildings and can include site planning, community and land use planning issues as well.

Affects and importance of greenery in buildings pointed out by Söğüt & Şenol (2004): *“Based on World Bank statistics the 73% of population Turkey lives in cities. This high ratio has negatively effected life quality with degraded urban fabric; unbalanced structural elements and green areas.*

*The green roof and façade determined to be effective in enhancing quality of life. In these zones cities heat island effects can be lowered, and decreased relative moisture can be increased. By eliminating cold and hot winds effect the differences between urban living spaces and rural areas can be decreased for the favor of living quality. The green roof and façade also have significant benefits in capturing dust and suspended particulate matter. By holding a certain amount of rain water runoff can be avoided. Studies revealed traffic noise in cities are reduced with the soil and plant cover on green roofs. Along with increasing air quality, these areas provide support eliminating greenhouse gases by increasing oxygen amount, capturing dust and suspended particulate matter.”*

In Turkey, climate change effects some important matters nowadays. Some studies have revealed that there is effect of large block of heat on urban areas in the western regions of Turkey. According to these effects, cities like İstanbul and İzmir have developed extensive stimulations for installation of green features, such as green rooftops and green walls. (Fig.10-Fig.11)



*Figure 10. Green rooftop of Zorlu Center / İstanbul*



*Figure 11. Green walls of Point Bornova Shopping Mall / İzmir*

The last years we have seen local authorities aimed to create an environment-friendly urban setting through a planned landscape development in urban areas involving the use of “naturalistic” styles. Professional interest in ‘naturalistic’ landscapes has certainly been very strong in Turkey. There was collected and analysed information about the different components of the landscape “public parks” and “recreation areas” often mentioned factors to make the city livable, pleasant and attractive for its citizens. In our country, there are lots of recreation areas where people spend their time such as Aşık Veysel Recreation Area and Konak square in İzmir. (Fig.12&13)



*Figure 12. Aşık Veysel Recreation Area in İzmir*



*Figure 13. Konak Square in İzmir*

#### **4.2. Greenery on the Ground Level: AGORA Shopping Mall - İzmir**

A 90,000 square meter rectangle mall forms the heart of the project and is complemented by a series of shared green spaces, including parking areas. The word ‘Agora’ is ancient Greek, originally used for 'open place of assembly'. Later the Agora

defined the open-air, often covered by canopies, marketplace of a city where merchants had their shops and where craftsmen made and sold their wares. According to this concept, the complex has different atrium and public spaces with greenery in front of the mall which are needed to improve the lifestyles of urban people and there should be a special focus on the consideration of environmental impact of human activities. (Fig.14&15)



*Figure 14. Building surrounding of Agora Shopping Mall / İzmir*

Designers favor a lighter, natural color palette and more natural light for these common spaces in their mall renovations. This is a clear indication that green spaces can increase the physical and psychological wellbeing of visitors and workers of the mall. In another research conducted in İzmir showed that the more time people spend outdoors in urban green spaces, the less they are affected by stress.





*Figure 15. Atrium of AGORA Shopping Mall / İzmir*

Different benefits have been acknowledged in connection to the promotion of greenery and biophilia in buildings. These drivers of the green building movement range from downright ecological remunerations to financial benefits. Moreover, prior studies concerning the benefits associated with green buildings have distinguished what is described as direct and indirect benefits and risk related gains (Lorenz & Lützkendorf, 2008). Naturally, the initial reason behind the green building revolution concerns the environmental or ecological issues which have been recognized the past decades. As a result, environmental benefits such as enhanced and protected ecosystems and biodiversity, improved air and water quality, reduced waste and the conservation of natural resources function as fundamentals for going green (USGBC, 2009). Nevertheless, in particular the financial benefits associated with green buildings have increasingly gained attention and been extensively researched and documented.

#### **4.2.1. Ecological Interaction**

At Agora Shopping Mall, designers installed lots of banana trees in the public courts. Designers were able to custom build these trees with unique branches and seating areas around the ornamental pool that were accented with shades of green and blue to add additional naturalism to the area. The theme of naturalism is carried throughout the

shopping mall, with containers planted with small trees, perennial flowers and ivies to add the right amount of organic feel to the fairly contemporary design. Plants are also known to optimize noise levels of interiors which is important for large shopping malls that can become quite noisy when area is busy. Public spaces of Agora can avoid customers complaining about noise by adding more foliage into the design.

#### **4.2.2. Sociological Interaction**

Agora Shopping Mall was designed by MATU Architecture with İzmir's natural landscape in mind, which includes several different colored and textured grasses, flowers and native banana trees. It truly is a design that reflects the community and location. Through decorating and designing public spaces of mall with plants and flowers, shoppers are much happier about their shopping experience as well as the scenery. To offset economic downturns, businesses are constantly thinking of ways to improve their customer base. The addition of greenery in Agora after the smoking prohibition in interior in Turkey, makes shopping center more appealing to potential customers. Plants portray a certain level of quality of the business that leads customers to want to spend more money.

Plants and trees in court area of mall are valued tool that can have a profound effect on a mall's ability to deliver an exceptional customer experience. As we have generally analyzed about at biophilic elements in interior space, plants tap into humanity's innate need to be close to nature. Commercial environments profit by nature's inherent powers to put people at ease by design interiors, exteriors or public spaces with lush greenery. Many studies have shown that the presence of plant life indoors can improve human well-being and increased human energy level. The power of plants in the commercial industry is not limited to the stores themselves. Especiall in Agora shopping mall, from directing line of walking to providing shoppers with a relaxing place to rest between shopping visits, plants can be used in a lots of ways in shopping centers.

### 4.3. Greenery on the Facades: Balconies in İzmir

Even though the amount of green spaces has increased after the studies carried out by İzmir Metropolitan Municipality and Regional Directorate of Forestry, the development has reflected on the fields outside the city center mainly on the forests surrounding İzmir. Increasing the urban built areas against the green areas negatively affects the quality of life. According to the development plan law No. 3194, the active green area ratio, which is determined as 10 square meters per person, is seen as a difficult target to reach in our country conditions. Based on the knowledge given by the İzmir municipality, it is determined that the amount of green space per capita is 12.68 square meters in 2015 in İzmir. (Fig.16)



*Figure 16. Center of İzmir / İzmir*

Heath (2015) mentions that “according to the UN by 2050 nearly 70% of the world’s population will be living in urban areas, there will be more cities and more megacities. As our contact with rural landscapes decreases our alienation from greenery and living elements will increase unless we green the urban environment and the spaces we live in. Scientists have demonstrated that our health and wellbeing is improved by access to nature, making us more resilient to the day-to-day stresses and pollutants of the urban environment. It is therefore no surprise that architects



*considering the future city are incorporating biophilic elements in their building designs.”*

To protect and improve the built and natural environment, İzmir local boroughs promote the addition of green on balconies and gardens. For example, Bornova Municipality and Karşıyaka Municipality organize 'Beautiful Balcony - Beautiful Garden Contest' in order to raise awareness about environmental awareness, to provide living environment in the city by increasing green texture and to create high quality urban spaces. (Fig. 17) These competitions affect people in terms of environmental sensitivity. Thanks to these competitions, environmental awareness is increasing, and cities are encouraged to create more livable and green spaces. (Fig. 18)



*Figure 17. Beautiful Balcony - Beautiful Garden Contest - Karşıyaka/ İzmir*



*Figure 18. Beautiful Balcony in İzmir - Anonymous/ İzmir*

#### **4.3.1. Ecological Interaction**

The planning of compact urban areas has become an emerging issue in many growing urban environments. Compact urban structures are supposed to make the transportation and public services more efficient as well as improving quality of life (Daniels, 2001).

It has been determined that covering the building surfaces in urban areas with green can reduce cooling costs by 84%. If you were to go back in time, before any city or agricultural land was developed, what you would find is an ecosystem that is very diverse, containing many different plants and animal species. Modern cities and croplands have severely reduced this biological variety. Green walls can be viewed as mini ecosystems; the incorporation of such a variety of plant species supports many beneficial organisms such as butterflies, bees, ladybugs, and humming birds (Green over Grey 2009).

### **4.3.2. Sociological Interaction**

In addition to ecological interiors and biophilic designs, currently we see living walls and green balconies on exterior walls. The increase of living walls in the built environment provide a healthy environment and improve habitable spaces in our interiors. Green areas and architecture related with nature encourage people to think positive and provide to our mental health. Urban green spaces appear in very different shapes, and therefore different types might be of different importance in the process of promoting social cohesion. For instance, front gardens are often understood as a means to enhance the possibilities of encountering between residents and the public (Gehl, 2006).

Although the space is rather limited, generally balconies in İzmir allow residents to allow for residents to do some gardening because of their dimensions. Residents use their balconies largely in the same way as the front gardens. On the other hand, local people use green elements frequently, regardless of their balcony size. This can be

related both to İzmir's climate and to the needs of people for contact with green elements. (Fig. 19)



*Figure 19. Beautiful Balcony in İzmir - Anonymous/ İzmir*

#### **4.4. Greenery on the Roofs: Turkcell AR-GE Building - İstanbul**

The technology center complex of a private telecommunication company is located in Gebze TÜBİTAK Research Center Technology Free Zone. The building, designed and built by Erginoğlu - Çalışlar Architecture, is single storey at the entrance side to four-storey at the working areas in the direction of land slope. (Fig.20)

The land area that was covered is regained by greening the roof and using the roof as a natural recreation area. The vertical circulation area is designed in the middle of the



building to ensure maximum use of the natural light. Turkcell AR-GE building has a remarkable feature in terms of example of faces of biophilia in architecture in Turkey with its interesting shape, most importantly sloping and flat green roofs. Designers of the building states that the 17 m height limit defined by the development plan law was taken to the part where the land is the lowest and the eastern / scenery area was utilized in the most optimal way. In this fiction, the high side forms the office spaces, and the parts facing the ground take the light from the large space created from the roof. The roof light line continues on the side façades with windows that open in triangles in two directions. Thus, office spaces are controlled by natural light in four directions. Extensive (rare) greening has been used in the terrace area of a total of 2500 square meters of the building, which is designed to be able to walk on the roof and even grass skiing. (Fig.21)



*Figure 20. Offices of Turkcell AR-GE Building / İstanbul*



*Figure 21. Green roof of Turkcell AR-GE Building / İstanbul*

The building is a perfect blend of Marmara region's rich architectural splendor and technological innovations, incorporating traditional concepts into modern and contemporary architecture. The building was designed as a knowledge and technology production center where 500 people work 24 hours when needed.

#### **4.4.1. Ecological Interaction**

The building design was conceived to have minimum disturbance to the surrounding ecological environment. This has preserved the majority of the existing flora and fauna and natural organisms around the building. Extensive erosion and sedimentation control measures to prevent topsoil erosion have also been taken at the site during construction. Indoor air quality is continuously monitored and a minimum fresh air is pumped into the conditioned spaces at all times. Some points are highly crucial for understanding the importance of the project that using biophilic elements which are;

- Roof garden covering 60% of building area
- Large green open spaces
- Maximum day lighting

#### ■ Operable windows and lighting controls for better day lighting and views

Among the many benefits of green rooftops, the various benefits associated with environment issues such as coping with climate change, energy saving and reduction of the urban heat island, can be listed as the most important. Green roofs have a significant role in reducing stormwater on the streets or conserving and improving biodiversity. The decreasing amount of urban greenery, the increasing building mass and the subsequent urban heat island can be mitigated by green roofs.

Conventional roof surfaces heat up as they absorb the sunlight. Radiation that is absorbed in the day is given back to the atmosphere at night. In the green roofs, these harmful effects almost cease to exist. As in this building, the green roof creates a cold space, so it reduces the energy usage considerably. Green roofs play an important role in the formation of the energy balance, as they delay temperature increase in the building and its immediate vicinity. In this example, the green roof creates a cool space, so it reduces cooling load considerably.

#### **4.4.2. Sociological Interaction**

Increasing the number of nature friendly areas in the urban scale increases the quality of life of the city people as well as raise morale power. The green roof removes the cold effect created by irregular, cramped urban environments completely covered with structural elements. It contributes to urban aesthetics. Depending on the purpose of usage, this effect does not stay in the beneficial psychological field, but it also provides positive contributions to society. Green roofs play an important role also in the increase of building value. In a study conducted, it is stated that the value of the area where a good tree cover is grown can increase by 6-15%. It is seen as an achievement that the use of green roof applications in the world scale as a living space.

According to human spaces report, employees working in offices with both internal and external green spaces along with plenty of natural light reported higher levels of well-being, in comparison to those working in environments without these natural

features. Their study reported levels of well-being and productivity that were 13% and 8% higher, respectively, for those EMEA office workers in environments containing natural elements. However, despite the benefits that natural light and space can provide, it was found that 30% of workers do not work in environments that provide this sense of light and space. Findings such as this should urge organisations and designers to consider how existing and future workspaces can be built or modified to provide light and space and in turn increase levels of well-being and productivity within the workforce.





## CHAPTER 5

### CASE STUDIES

#### 5.1. Introduction

Greenery in our built environment contribute to the sustainable development of urban areas, and increase the quality of urban life. It is necessary to predict the physical, physiological and social structure of the needs of the users and to shape the built environment according to these needs in order to make life more physically and psychologically comfortable and create environments more suitable for human needs. The main factors that come from human demands and that act on their psychological and social needs are sociability, calmness, personality and the internal enrichment of the individual.

Biophilia is an effective way to maintain the psychological and social needs of the individual. In the context of social factors that are important in architecture and interior design, positioning of seating, fountains, plants, outdoor furniture, etc. directly affect the gathering or dispersal of people.

For this purpose, it is investigated whether the green areas of different cities are sufficient in terms of architecture and urban design in Turkey. This research involves surveying the use of green space and the need for green areas by people in different cities in Turkey and evaluating existing green spaces according to user needs.

The quality aspect of green spaces is as big as their spatial importance. The value of green spaces is increasing due to the positive effects on human body and spirit as well as on microclimate, air conditioning, dust filtering and noise reduction.

Buildings require air, water, energy and space for their occupants. These are provided by systems in place like the ventilation system, the water supply system and the

electricity supply system. The materials which are used in the construction of the building also produce environmental impact like carbon footprint, pollution through wastes and slurry, and the consumption of water and power. Buildings are one of the major sources of pollution that cause air pollution and are responsible for climate change. For that reason, greenery and natural systems should be implemented in urban projects more and more over the years.

Urban environment quality becomes worsen every year. There is a fact that the urban air temperature is gradually rising in all cities and some effective measures are needed to lessen it. Planting of vegetation is one of the main strategies to mitigate the urban heat island effect. Large urban parks, green walls and green roofs can extend the positive effects to the surrounding built environment.

## **5.2. The questionnaire**

Most of the general population is not directly aware of all the above, yet the public can feel the effects of such subjects on their everyday lives. That kind of public awareness is a topic that the present work aims to explore.

The aim of this research is to investigate whether the green roof, green wall and common green areas at the provincial borders level in Turkey are adequate in terms of space and qualitatively. This research includes surveying the use of green space and the need for green space by some people in Turkey and evaluating existing green spaces according to user needs.

This work analyzed two case studies with direct observations and with help of the questionnaire which was distributed to people in the case study areas.

The objective of questionnaire was;

- To analyse interaction between local people and nature in the context of architecture
- To assess the statistical analysis of how greenery in built environment affects local people

The questionnaire was divided in 3 parts;

- Personal preferences of participants
- Use of greenery in their life and how
- How they react to greenery in their built environment

In the first part, the most important demographic and social variables, gender, age and educational status, were tried to be determined in order to reveal the subjective structure of the individuals related to the current visitors using the green areas. These questions are used as independent variable to arrive at the results by identifying the individual characteristics and social situations of those using the built environment. The purpose and the gender question were asked to measure behavioral differences. The age range of the participants was asked in order to avoid linking the tendency to use biophilic elements in the living area with the age range. Question on living condition were asked to participants who use biophilic elements were to explain the living conditions of the province of İzmir according to their urban living environments, and to determine the current state of possession and the ownership status of the houses they live in.

The second part of the questions was about how much they considered and used the biophilic elements in the participants' living spaces. The various data presented by participants using biophilic elements; how they integrate living elements into their lives, the distinctions of advantages and disadvantages of plants, and the frequency of use of natural areas.

The third section consists of closed-ended questions. The priority is to determine whether the participants want to have a green area in the city they live in. This section is to learn the main purpose how people determine their living spaces and the architectural structure of the cities they live in in terms of biophilia. It has been determined how participants, who use biophilic elements, can interpret architecture differently in terms of urban development. The most important question in this section is whether or not olive groves and lush areas around the city are accepted as green areas. It has been determined how conscious they are in the context of integrating biophilia and architecture. Responses to green elements in participants' living areas or in public areas were measured.

### **5.3. Case Study 1: Konak Square in İzmir**

İzmir is the third largest city in Turkey in terms of population and urbanization rate. In addition, as an ancient city, it has preserved its existence from the ancient times without losing its significance. The level that the city has reached over time is, first and foremost, due to its superior location and favorable natural environment factors.

The most prominent feature of İzmir's geographical location is the formation of a coastal city. This quality is one of the main factors determining the economic, social and cultural structure of the city throughout history. However, waters, pollution, coastal fissures, roads running parallel to the shore that transported heavy vehicle traffic have accelerated this break, as wars, economic and social developments have changed trade routes and the city has begun to break its ties with the sea. The first plan of İzmir was prepared by Luigi Storari in 1854. The first urban regulatory proposal concerning Konak Square was brought by the municipality established in 1868. In 1909, the municipality proposed that barracks of the area to be replaced by a "national garden", a theater, a library and a club building. In 1913, the outer garden wall of the barracks was removed, and this area was organized as a park with Government Square.

In Le Corbusier's reports and drawings presented in 1948, the suggestion of building with multi-storey blocks in the green brought to Konak Square and its surroundings influences all subsequent plans. Le Corbusier considers the Kemeralti bazaar to be a "depressed area" and suggests that several monuments should be cleaned outside the building. (Fig.22) This plan was not applied to the square. (Egemimarlık, 2004)



*Figure 22. Plan of Konak, Le Corbusier / İzmir*

The design work of the current layout of Konak Square and its surroundings began in April 2002, and its implementation took place in 2003. The existing protection plan, the half-way pedestrian road between the coast and the Variant, the pedestrian platform on the road, was used as the basic data in this study. (Fig.23) The principles that determine the structure of the space planning are;

- Renovation of the historical memory, emphasis on the traces of the old Konak Square,
- An area of approximately 20 hectares, without any building on it, is arranged as an open space suitable for contemporary interpretations and uses,(Fig.24)
- Creating a series of sustainable and flexible spaces that can respond to different programs over time,

Using spatial, social, cultural and natural factors on different functional areas, the provision of spatial organization is adopted as the basic principle of planning. (Gürsel, 2005)



*Figure 23. Plan of Konak Square / İzmir*

The space between the motorway and the sea was treated as a wide green space, with vehicle arrangements along the coastal route and parallel bicycle path. The hill, which is located on the southern tip of the coast, where the half-way point sits, was arranged as a gradual green navigational amphibia on the sea side. In the design of this area, the green spaces that help to get the spaces to each other, the depth and the space are perceived, as well as grouped leaf-turning tree groups and tree sequences which form the path-length physical limitation and shadow were planned. Green spaces were defined as a part of space organization and random arrangements were avoided. (Egemimarlık, 2004)



Figure 24. Plan of Konak Square / İzmir

### 5.3.1. Observation

The irregular urbanization that took place during the era of the Industrial Revolution resulted in the disappearance of green tissue in the cities of the period. Due to the factories built and the lack of aesthetic works, air pollution and visual pollution have started in İzmir. This has affected the lower classes living in poverty and misery generating a negative psychology. Before the industrialization, greener residential districts were created to unite the village and urban life so that the working class, accustomed to village life, could adapt to city life. Later, it was aimed to strengthen the relationship between the courtyard and the nature of the residents, which is designed in the block systems produced. The general aim in the block urban systems was to collect the houses and to leave the nature untouched by damaging the land at

least. People must be directly intertwined with nature; it is known that even knowing that nature can be used only by seeing nature, such as watching flowers in a park beside trees or looking at trees from a window, or even when such areas are available soon and when desired, they provide various psychological benefits to humans. The idea that being nested with nature helps relieve the psychologically and reduces the stress of city life has emerged with the beginning of urbanization.

The cities, which are at the center of environmental degradation due to their large population and concentrated human activities, are also the regions most affected by these deteriorations. "Sustainable settlements and liveable cities" have become one of the priority issues to be reached on the world agenda with the embodying of these threats concentrated on human settlements and cultures. Green areas, which are one of the most important indicators of people living in cities, such as urban people, have been the areas most affected by rapid urbanization and industrialization activities, especially in developing countries like Turkey. Green spaces are one of the main elements of the city, shaping the cities, as well as integrating other areas of use or balancing the physical texture of the city with its distinctive features and having important functions for the cities. It also allows the city to meet with nature, allows active and passive recreational activities, and creates more liveable cities.

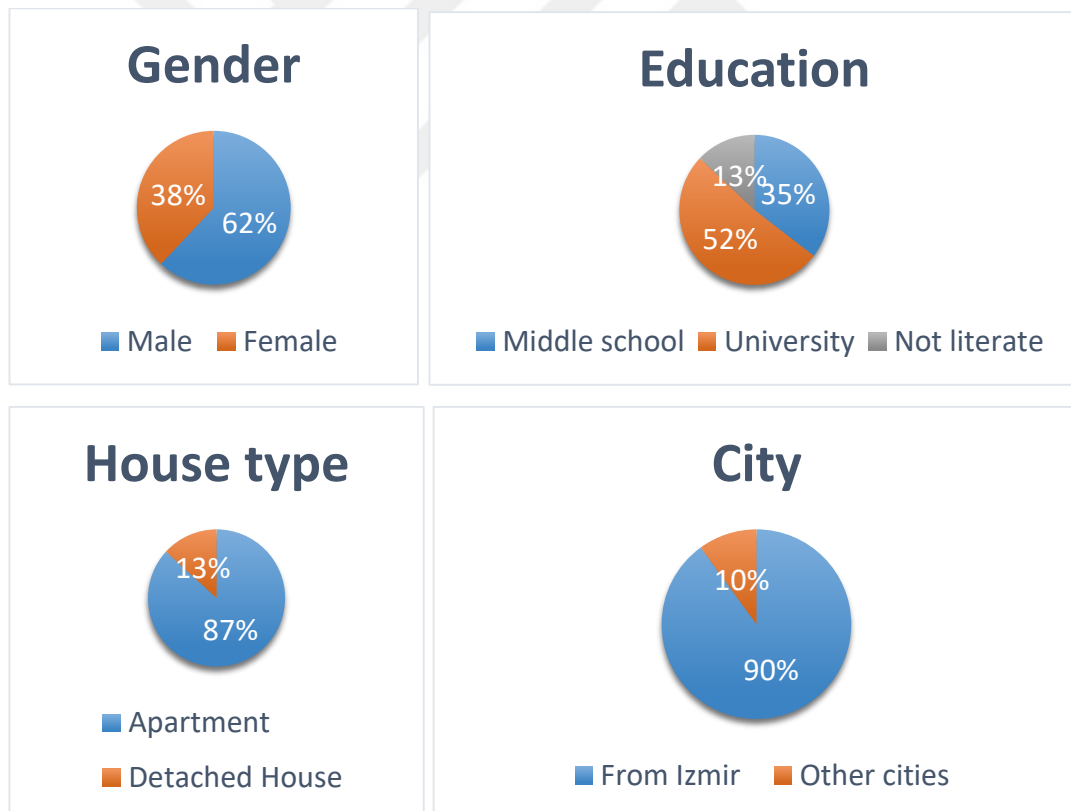
### **5.3.2. Questionnaire**

This questionnaire was filled by approximately 115 people in Konak Square. (Appendix.1) The main purpose is to measure the importance of the open-green spaces, with the example of Konak, which is considered as the center of İzmir, and which has served the local people in recent years. The individual characteristics to be determined for existing visitors using the central square in Konak province; sex, age, educational status, and type of household are the most important demographic and social variables that reveal the subjective structure of the individual. 62% of the park users participating in the survey are male, and 38% of them are women. When all survey results are considered; the difference in social and economic structure directly affects

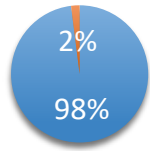


the forms of usage of biophilic elements and sensitivity to green space. It can be said that the level of education and the questions of the region they live in differ from those of people living in a residential unit with a high level of education and a majority of the working people with a social structure and a rural social structure with a low education level.

In terms of the questionnaire, 35% of the users are middle school graduates, 52% are university graduates and 13% are not literate. A high rate of 38% constitutes high school graduates. The results show that the dwellings of Konak Square users can be grouped as 86.8% apartments and 13.2% individual houses respectively. If the findings related to the individual characteristics which are tried to be explained with the outlines so far are to be evaluated with a very general approach: It is possible to say that the level of education is moderate and the population of Anatolia has a mass of visitors consisting of the majority of young, middle, old and partly middle aged men.

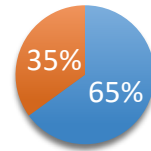


### Love of animals



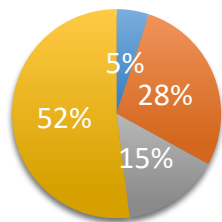
■ Yes ■ No

### Plants in their homes



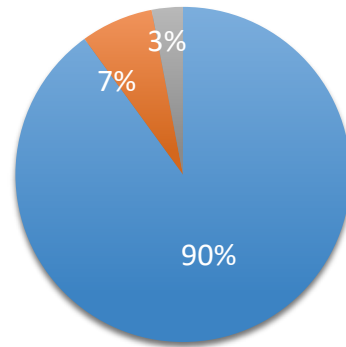
■ Yes ■ No

### How often do you go to green areas?



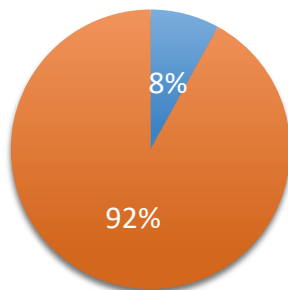
■ Don't ■ Sometimes  
■ Frequently ■ Everyday

### Attention for greenery



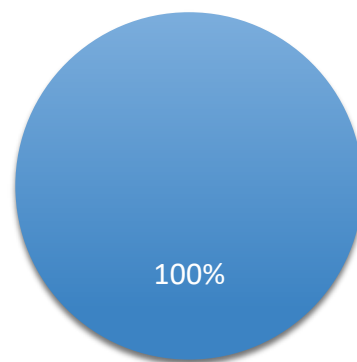
■ Yes ■ Sometimes ■ No

### Enough Green Area



■ Yes ■ No

### Contribution



■ Yes

Questions about the type of house they live in and the area they live in were asked to the participants. According to the urban living environments of the users of the Konak square, this data for explaining working and living environments in İzmir and out of İzmir mainly covers the determination of the current municipality situation and accordingly the findings about the region where the users live and the ownership status of the houses they live in. 90% of the users of the square are lived in İzmir while 10% are from outside İzmir province.

When the data on the adequacy of the existing green areas defining the "quality of use" according to the users are taken into consideration, it is seen that the negative results of the outcomes are largely suppressed. When it is evaluated by the people using the built environment that there are enough green areas in the cities and regions they live in, it is found that green areas are not enough by a high rate of 92%. When the question of how they feel in the green areas is asked to the participants, the answers are quite positive. 83% of the participants pointed that they felt peaceful in green areas. 100% of participants stated that green areas are an important contribution to creating urban identity and image to city / places and that green areas have added wealth to cities and buildings in terms of plant diversity and natural landscape values.

There are some different questions goals to examine how they react greenery around their built environment. The half of results show us participants everytime go to green areas. Almost all participants pay attention to the greenery of buildings / interiors. Again, almost all think that there is not enough green area in their cities. 100% of participants have same opinion that green areas have an important role in creating the identity of the city and the image of city sights.

The last question of the questionnaire was prepared as an open-ended question. Purpose of asking the open-ended question is to determine what the individual ideas of the intended people and what differences can be made in order to produce more liveable spaces. 80% of the people think that the urban transformation projects reduce the existing green area ratio and the municipalities should support the increase of the green space at the urban scale.

#### 5.4. Case Study 2: Campus of Cumhuriyet University in Sivas

There are studies carried out in order to create Cumhuriyet University's students who enjoy their time, feel happy, peaceful and safe, live in the nature, live for 24 hours, establish a qualified campus and settlement areas worthy of the cultural identity of Cumhuriyet University, which is established 45 years ago. In the World where human-caused environmental problems are increasing day by day, becoming a university student has a great responsibility. While Cumhuriyet University is working on the production of science and technology necessary for a sustainable future, on the other hand, it has also consciously assumed the responsibility to become a model for high quality, sustainable and environmentally friendly campus. University aimed that, it is necessary to prepare the projects and apply them correctly in order to the studies on conservation of existing ecological systems, the simultaneous reclamation of sites damaged both ecologically and physically. (Fig.25)



*Figure 25. Campus of Cumhuriyet University –Taken by: Şenol Biçer / Sivas*

Deakin (2016) states that research has proven that our attention capacity (essential for our cognitive functioning) is restored when we come into contact with nature. Studies have demonstrated that biophilic educational spaces have the ability to improve performance and the well-being of both staff members and students. Due to urbanisation, the amount of green space within educational settings is increasingly reducing. It is therefore important that as architects and interior designers, we learn how to best utilise biophilic design principles in order to reintroduce nature to our educational buildings and spaces.

Heath (2015) pointed that there are some key recommendations about biophilic design.

1- Increase views onto nature:

Optimise views onto nature by enlarging windows and ensuring they are placed at appropriate heights for both students and staff. Ensuring greenery is in the periphery vision of occupants has been proved to reduce heart rate and stress levels and boost productivity. Such views can also strengthen a human connection with nature and serve as a protective environment, particularly for children.

2- Increase natural light:

Make use of windows, skylights and reflective surfaces in order to optimise exposure of natural daylight. This creates an energising environment, helping to increase student's concentration, learning speed and performance levels.

3- Indoor plants and living walls:

Greenery not only creates visual interest within a working environment but also can improve air quality and oxygen levels, boosting the concentration levels of staff and students. Indoor greenery also acts as an effective sound absorber, helping to control acoustics within a classroom.

#### 4- Natural elements and references to nature:

Incorporate natural elements like wooden furniture, as well as making use of existing features like exposed timber flooring and brickwork. These features stimulate the senses, which help to energise both staff and students and reduce stress levels. In addition to tactile natural elements, 2D imagery can be incorporated to aid psychological recuperation.

#### 5- Recuperative spaces:

Create “safe” zones within the building for students and staff to retreat to. By including features such as low lighting, muted colours and tones, soft furniture and pleasant views we can aid relaxation and concentration. Restorative spaces that are primarily used for time away from studies can enhance productivity.

Such principles have been applied in CU campus.

#### **5.4.1. Observation**

Cumhuriyet University, founded in Sivas, the second largest city in terms of surface area of Turkey, was founded on 11000 acres of land. Today, there are 15 faculties, 4 institutes, 1 state conservatory, 6 colleges, 14 vocational schools and 54,986 students.

Open-green spaces in campuses have many aesthetic and functional effects on students. Herbal and structural materials used in university campus open-green areas provide physical and aesthetic value to the city with features such as form, size, texture, color and line. Green areas alleviate the hard tissues of monotonous geometric structures or building masses of campuses, softens sharp lines, and gives them vitality. According to observation, there is an important point that these areas establish an organic relationship between human beings and the environment, providing a balance between structure and space. Greenery controls and organizes the microclimate of the campus. For example, cleans the air, increases the amount of oxygen, keeps dust or dirt in the air, and provides air circulation. It provides opportunities for students to meet their active and passive recreational needs such as entertainment, recreation,



sight, sport events. It helps individuals to socialize by influencing the relationship between students and academics in a positive manner. It plays an important role in informing and raising awareness of the concepts of nature and environment. (Fig. 26)



*Figure 26. Campus of Cumhuriyet University- Taken by: Şenol Biçer / Sivas*

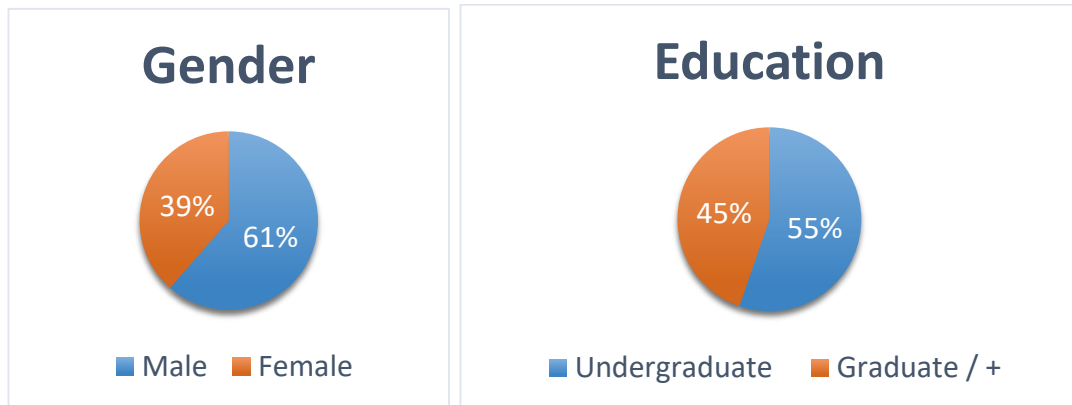
It has been observed that a large part of the campus has a lot of natural surroundings and plant materials instead of being covered with structural or hard materials (concrete, asphalt, key stone). The campus offers a variety of recreational activities due to its large open-green area outside the campus, buildings and facilities. There are many recreational functions such as sports fields such as football, basketball, volleyball, tennis courts, mini golf, amphitheater, sitting places, ornamental pool, and cafés in the open green area in the south part of the campus. A large part of the campus has been planted in various arrangements.

### 5.4.2. Questionnaire

The findings of some of the social, economic and demographic characteristics of C.U students and academicians participating in the research and their attitudes towards green areas were presented by the method of percentage analysis. (Questionnaire-Appendix.1)

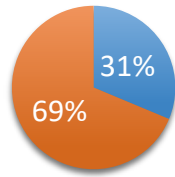
60.5% of the respondents were male and 39.5% were female. 50% of the survey participants are between the ages of 18-25, 42.1% are between the ages of 26-35, 7.9% are above the age of 41. In addition, 68.7% of the respondents were from Sivas and 31.3% were from other cities. Participants in the study receive 55.3% undergraduate education in terms of education status and 44.7% have graduate education level.

86.8% of the participants in the survey live in apartment houses while 13.2% live in detached houses. While 54.8% of the survey participants stated that they had used the green areas sufficiently on campus and that the green areas were adequate, 45.2% stated that they were not sufficient. 100% of respondents thought that the green areas were important contributions to creating urban identity and city image. Participants in the study indicated that 'green areas are rich in vegetation diversity and natural landscape' 89.7% of the respondents say yes, and 10.3% say no.



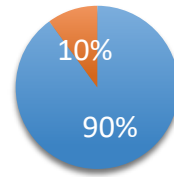


### City



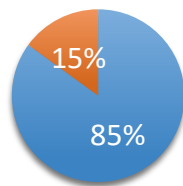
■ From Sivas ■ Other cities

### House type



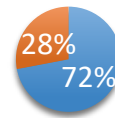
■ Apartment ■ Detached House

### Love of animals



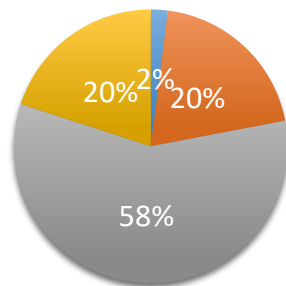
■ Yes ■ No

### Plants in their homes



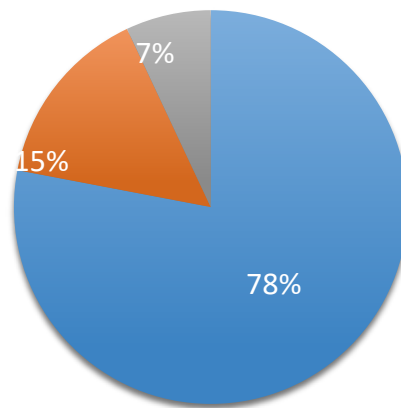
■ Yes ■ No

### How often do you go to green areas?

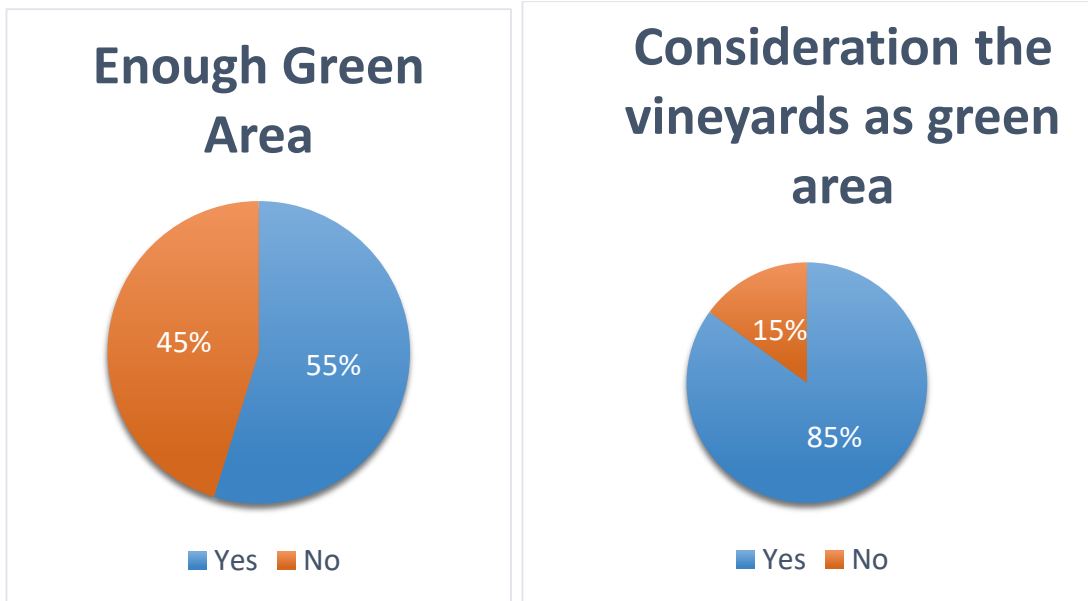


■ Don't ■ Sometimes  
■ Frequently ■ Evertime

### Attention for greenery



■ Yes ■ Sometimes ■ No



According to the results of the last open-ended question, users of built environment and greenery in their campus thought that people living in and around the places that are able to respond to all the needs of the people, who are in harmony with their well-being and nature, organized in accordance with their activities and psychological health in terms of ergonomics will be very efficient.

The 'green campus' concept has not yet been fully established in Anatolian cities. It is extremely important to identify the areas of different social, cultural, economic, psychological characteristics and activities. And also, all of these characteristics should be provided in terms of optimum comfort.

## CHAPTER 6

### HUMAN INTERACTION

#### 6.1. Views on biophilia by designers

In the direction of planning decisions, the design process in which the most appropriate spatial composition is revealed by shaping the fields, develops in the continuation of the planning process. Therefore, planning and design are successive physical planning processes. In today's increasingly evolving and changing world, every day more and more environmental problems arise that will affect the architecture. This increases the importance of interdisciplinary cooperation to solve problems through multi-faceted approaches. This cooperation has been applied in environmental planning and design projects in recent years and it is seen that the projects have proved successful results mostly prepared teams of different disciplines.

Designers and the community agree that natural resources are being used wildly in the world, especially in the industrialization of the world, rapid population growth and parallel urbanization. Only elements that complained of being declared air pollution persisted until the pollution of the flowing waters, the seas and the agricultural lands. For years, natural resources such as soil, water and air have been perceived as cheap and allocated resources of industrial production. We can think and accept the idea of green architecture as a reaction to the rapid depletion of nature in this sense, as a form of opposition. Again, the term "sustainable", which is used to describe almost every concept in recent times, is indeed a sign of how the difficult situation is.

In this study, questioning the approaches of specialists from different professions to the planning / design process, identifying common points and differences, and developing proposals that can be considered in interdisciplinary studies. For this

purpose, 2 specialist designers were interviewed. Twelve questions were asked to architects to analyze their attitudes about biophilia. Within the scope of this research, questionnaire with Deniz Aslan and interview with Erbil Coşkuner were conducted.

### ***6.1.1. Deniz Aslan***

In 1986, he graduated from Istanbul Technical University, Faculty of Architecture as an architect. In 1989, he graduated from Yildiz University Institute of Science Landscape Planning program and received his title of high architectural - landscape architect. In 2000, I.T.U. Graduated from the Institute of Science building information doctorate program and became a doctor. The designer has participated in many national and international projects in the field of architecture and landscape architecture, won awards in many competitions, and his designs have been published in many national and international journals. The designer is awarded the 2002 national architecture award in two categories with his work on abs plaster block and works on industrial project and space.

First question was asked in order to question the importance and use rate of the designer to the green spaces.

- “What is the role of green / natural elements in your designs? What kind of applications do you use? Why are these elements important?”
- *In my opinion, the internal and external relationship is very important. For this reason, the primary source of daylight and the green elements fed by this source may have a significant place in the architecture, depending on the context of the building. Primarily in our projects green materials, especially in terraces, is still used actively. The green elements are nature-related relationships, they are dynamic structures, they change according to the seasons and therefore have positive effects on human biorhythm, their usage on structural surfaces is decrease of surface heat, decrease of CO2 emissions, sun filtering etc. It is possible to talk about its ecological contributions.*

Second question was asked to inquire whether there is any difficulty in integrating the green elements into the designs.

- “What is the most challenging aspect of using green elements in your designs?”
- *The maintenance of the green elements is therefore related to the creation of the right living environments, the creation of a sustainable return as possible, the proper infrastructural techniques and technology, and, most importantly, the establishment of a hydrological return to water removal and reuse of this water.*

Third question was asked in order to determine what the reactions of Turkish architects as biophilic. It is desirable to learn how to encourage the use of green elements and create an impact on designers.

- “What are the reactions of Turkish architects especially to your discussions and / or encouragements about biophilic design / Green designs?”
- *In general, the reactions I get are always positive and always curious, but everybody is in search of ready knowledge and the number of people who pursue their own experience is very small.*

Fourth question was asked as an experienced architect, how new architects on the market could propose to the use of green elements in their designs.

- What would you suggest to young architects (new market designers) about biophilic design?
- *The use of nature as a resource is something that architects are already familiar with, but I think it is quite pleasant to be a part of the genus of the dynamic and living forms of nature, as living matter participates in architectural space. For this reason, in my opinion it is valuable to think more about designing with nature.*

Fifth question was asked the request phase of the projects using green elements. It has been questioned how much the customers are dominating the green staff, they decide to offer it as a request or as an incentive decision.

- Do your customers have requests for green staff? Or is this just your promotion?
- *It depends on the quality and content of the project.*

Sixth question was asked for analyzing the level of consciousness of the extent to which the green areas they want in their habitats.

- If your customers want to apply these green elements, how feasible is it for you?
- *As I mentioned before, applicability can be a part of engineering and technology, or even a part of know-how.*

Seventh question was asked to find out to convincing customers to use green spaces in their living spaces.

- How difficult / easy is it to convince your customers that you are more initiative than your customers?
- *Generally speaking, convincing the employer is about accounting for the budget to be spent and the positive contribution to the project. Apart from that, visual evaluations are dominate the decision stage.*

Eighth question was asked why customers preferred green elements despite their cost. This question is important to understand that biophilic design is perceived as a serious understanding or as a trend.

- Why do you think customers prefer this despite the high cost of implementation of the green staff?
- *Same answer with seventh question.*

Ninth question was asked to investigate the main reason why designers use biophilic elements.

- When applying green elements, is basic anxiety aesthetic reasons or is it ecological and environmental such as cooling, noise prevention, insulation, protection against light, creating soft ground?
- *Of course, thinking and designing on a structured natural environment is and a universal system, and every kind of ecological value is the main axis of the subject.*

Tenth question was asked the extent to which disciplinary communication is being applied when integrating green spaces into architecture.

- Are your designs consulting with experts in the field when applying green spaces?
- *Sometimes when my specialty is not enough, yes.*

Eleventh question was asked to understand how much the designer is adhere to the 'natural' concept.

- Have you applied 'artificial' green spaces in your projects?
- *All green areas which produced by human hands are artificial if you are making this work on architectural walls and roofs.*

Twelfth question was asked in order to question the proportion of positive reactions of users to green spaces.

- How much positive responses did you get to the green areas you were applying, if that would evaluate the response of users or visitors? If you were to give a percentage, how much would it be?
- *Generally, the returns are very positive and I can say that this rate is over 80%.*

### **6.1.2. Erbil Coşkuner**

An interview was made with Erbil Coşkuner, the architect of the Agora shopping center, about green spaces, which have become a new trend in the design world as well as an important necessity. In the interview, the use of green spaces in Turkey and the usage rates of green elements in Turkish modern architecture were discussed. From the modernization process on the general situation of the architectural field in Turkey, it was discussed how the 'green' concept was integrated into architecture.

Summarizing Erbil Coşkuner's ideas about greenery, he pointed that sustainability has become a necessity, not an election. Design and sustainability principles must be combined to address the effects of climate change, and architectural education must evolve. It is envisaged that in the coming years, green building criteria will be included in the standards and that everyone who has or does not care about sustainability will have to know this. The architectural field as in the world, technological developments in Turkey are increasing. But simultaneously with these technological developments, damage to nature has increased and climate change has become a current issue. The destruction created is above the nature's self-renewal capacity. Unconscious consumption has caused us to recognize our limit on resources. Finally, and most importantly, human health is at risk.

### **6.1.3. Dürrin Süer / Metin Kılıç**

In the context of biophilia, and biophilic potential there are lots of successful projects in İzmir. An interview was made with Dürrin Süer and Metin Kılıç, two of the architects of Asma Bahçeler in İzmir (see Fig.29), about biophilia and how nature interact with architecture. The architects stated that they did not start with the cladding ideology for existing structure. They go through the idea of how we can integrate into the existing nature. It is important that the ventilation, illumination and view of the building are perceived from the interior. They emphasized that their basic tendency is the continuity and fluidity of the inner-outer association. They are trying to use the data of nature to consume the current energy.



First of all, users need to live with nature. They are trying to create a more sustainable system, not destroy it. Stressing the cities have become more disconnected from the nature, the architects are now emphasizing that they are concentrating only on the green roof, and that they can integrate nature into the spaces without using any green elements, such as in the Japanese philosophy. Architects stated that the most important point of their designs is to integrate nature with minimum intervention. *“The materials used must be recyclable. For example, in a project, we designed structure to be elevated with the help of piles, not directly to the earth. We used the rest of the stones from the excavated area later, when covering the buildings. And we placed structures to the current flora without cutting any trees. All materials removed from the defective area to place the construction are used in structure or around the building itself. Protecting nature is always the designer's decision.”*

For example, Paley Park, located in New York, is a mobile garden built between high buildings. The psychological state of the people who go to the greenery from concrete also changes. On the urban scale this is also a change effort. There is a difference in ideology between defining a green space and putting green elements in an area that is a surplus of the landscape.

#### **6.1.4. And Akman**

He continues his academic and architectural works on building biology and ecology for more than 25 years. He carried out his education in Mimar Sinan University, New York University and Institut für Baubiologie + Ökologie. After realizing worldwide his ecological architecture projects and building applications in the Office of Lichtblick Architecture for 17 years, he returned to Turkey in 2007 and become a founding partner of **eds-a architecture** where he continues his international architecture project class on modern earthen architecture in Selçuk University. At the same time, he is one of the consulting specialists to the UN project: ‘Promoting Energy Efficiency in Buildings in Turkey’. He is doing various trainings and workshops on

ecological materials and construction methodologies and participates as guest speaker in several conferences in this field.

He pointed that first of all, we need not to be in need of green and sustainable concepts. Architecture should create these by itself. These concepts are brought into the capital order. Such concepts are actually a perception management. First of all, environmental awareness must be spread out on the base. We are seeing only a few examples in the world as well as not sacrificing conventions with natural building materials and less energy-consuming materials and designed structures. Today, there are two important points that cause of sickness, the first is nutrition, the second is closed environments. Therefore, indoor environments should be made as harmless as possible. Akman stated that social population density needs to be considered in urban planning. All these dynamics must be investigated during the project phase so that healthier and more qualified structures and areas can be designed for people. He pointed that architects need to investigate social relationships.

According to a survey of Germany, 40,000-50,000 inhabitants are a very suitable scale for quality living. Germany owes its development to this developed town model. It will be very difficult to implement this in Turkey. Because it is rich in culture and very diverse. There are too many passes from the villagers to the cities and they are triggering the emergence of urban transformation projects. According to Akman architects do not know what kind of social behavior people live there. Therefore, you can not predict according to whom that the project will be made. If the scale of the project is smaller, we can provide more convenient control. In this regard, we must start with the smallest units to change the perception.

And Akman stated that YBE (Building Biology & Ecology Institute Turkey), studies the effects of built environment on the health of human and nature. YBE creates content, share information, trains, organize seminars, conferences and gives consultancy in order to enable the spread of unbiased information, increase expertise and applied work on the field of building biology and ecology. YBE's interest extends

from sustainable housing, innovative building materials, environmental health, medicine and sociology until biotechnology.

YBE aims at reaching holistic solutions by means of establishing relationships among these diverse domains, in line with its focus. YBE is at the same time, an information-sharing platform that spreads sectorial news, evaluates developments on the international building biology agenda.

He described that we are trying to make presentations and workshops especially at universities about these studies. Increasing the perception is our main trend at this stage. As we increase the samples and see that the success rate is high, people will get interested and want to learn. Unfortunately, things are happening in Turkey like this. Talking is not enough to reach people. It is more influential to people to see built examples with them. We are very happy for each project we have designed because the returns are very positive.

## **6.2. Views on biophilia by the public**

The green areas that remain unbuilt in the cities are gradually decreasing. In order to counteract to this unavoidable reduction, the design and implementation of environmentally friendly green structures is essential. It has been determined that both public and building-related disciplines should be sensitive in order to preserve green areas in cities. The existing green spaces in the city are not enough for the needs of the users in terms of their aesthetic and functional features. In this regard, the general reaction of the public believes that municipalities can be a significant actor in increasing the green area ratio. Most of the researchers believe that the green areas lost over time in urban areas can be recovered by greening the roofs or walls of buildings. Outdoor spaces and green natural surroundings examined in terms of recreation and health are places where people like to take back their batteries after they have been stressed.

Surveys show that people who visit green areas regularly could have a higher quality of life. Roof gardens and green facades provide green spaces where asphalt and concrete views are dominant. In such cases, there is a relatively balance between built environment and nature.

According to the surveys conducted in Izmir, the city has some determinations and recommendations of the people to provide a modern and green city view to the city and to meet the open-green area needs of present and future people. First of all, the vernacular and application development plans made by the municipality should be planned and designed rationally, aesthetically and functionally according to the conditions of the day taking into consideration the ecological, social, economic and cultural features of the city. When implementing city development plans, sociological and human health oriented considerations should always be kept on the front line, rather than political aims and tendency to create land rents. When designing public housing areas within municipal boundaries, it is obligatory to make an environmental regulation to cover the green area that will be destroyed. In the process of planning and implementation of the green area, the social texture of the urban person (such as age, sex, occupation, culture level), green space needs, tendencies and expectations should be taken into consideration.

Another survey and questionnaire which is done in campus of Cumhuriyet University shows that instead of creating new green areas that need to be built in the short walks of Sivas city, existing and potential green areas need to be re-planned and designed as aesthetic, functional, well-equipped recreation facilities. Particularly, there is a great benefit in converting existing *mesire* areas into urban parks. Local administration and university administration should also take an active role in informing and raising awareness of the local public about green space and garden arrangements.

Based on these outcomes, we can see that the university administration has taken new decisions about environmental regulations. It is possible to say that in recent years the faculties and the existing private companies on campus have followed these decisions. Academicians and students are trying to improve campus areas both environmentally and psychologically by working synchronously within the context of environmental

regulation. (Fig. 27) We can say that in the new buildings that are going to be built on the existing campus area, they are creating green spaces where people can spend time around buildings in an effort to restore the green areas they destroyed. This campus located in the Anatolian region is capable of being a paradigm for other universities in Turkey to work on a biophilic agenda.



*Figure 27. Campus of Cumhuriyet University – A professor planting the garden of faculty - Taken by: Şenol Biçer / Sivas*

## CHAPTER 7

### DISCUSSION

Based on the observed applications, the author believes that there are two type of biophilia; basic and advanced.

**Basic** is greenery with a rather decorative function – e.g. flower pots on a balcony.

**Advanced** is when greenery in incorporated in the built environment in an effective manner – e.g. green roof.

In Turkey, we see examples of both types, especially many with a ‘vernacular’ character that reflects an instinctive, grass-roots biophilia.

Two important examples will be examined in İzmir city according to these two categories which are Folkart Narlıdere (Fig. 28) and Asma Bahçeler (Fig. 29).

If design doesn’t focus on aspects of the natural world that contribute to human well-being in the age-old blending with the natural world it is not biophilic. When we analyze the Folkart Narlıdere example, there are some potentially biophilic features such as sea view, green elements etc. In the Folkart Narlıdere Project, the topography of the area in which the land is located, the existing structural patterns, the urban features such as transportation and density, and the sociological structure of the area were analyzed. The structural filters created by the involvement of accountants in the account of the future user are designed in the light of this interpretation as the distinguishing feature of the project. The natural texture, which is concentrated both vertically and horizontally over the usual dimensions, has been predominantly the main material of the filters and has been transformed into an integral part of the structures in this context.

On the other hand, at the beginning of the project, the designer selected to use olive trees on the facades. The main building is behind a large scale steel lattice holding many small olive trees. According to Salingeros there are many factors that contribute to human wellbeing is biophilia, our attraction to the geometry of biological structures. This very broadly includes enjoying environments that are either natural, or that mimic nature in an essential geometrical manner, but not just as a superficial copy or decoration. Biophilia also includes our positive interaction with other persons, which is necessary for us to live life fully. In the light of these positions, Folkart Narlıdere can be interpreted as a pretentious approach to biophilia. The concept appears to be just adding some green elements and use them as a selling advantage. If green elements want to serve a genuine biophilic idea, they should serve functions like shading or cooling, not just symbolic decoration.



*Figure 28. Folkart Narlıdere Residence. Architect: Emre Arolat. İzmir.*



Another interesting example is Asma Bahçeler in İzmir. An upmarket apartment complex of over 100 apartments on a green slope of Narlıdere, not too far from the previous example. It demonstrates the use of biophilia as a property selling advantage as in Folkart Narlıdere. Departing from the green tower paradigms, the multi-storey building has a stepped up layout following the natural slope in an area with more trees than building. The green roof of one storey is the garden of the next above. Asma Bahçeler can be considered as a successful project in terms of adaptation to the land and offers a life close to nature for all its inhabitants. The project has characteristics that do not disturb the texture of the mountain and the city as other constructions do. This is very important for İzmir, which is developed frequently on rugged land.



*Figure 29. Asma Bahçeler Residence. Architects: Tanyer İnşaat. İzmir.*



## CHAPTER 8

### CONCLUSION

This thesis focuses on the use of vegetation in the built environment (architecture) in Turkey. The work considers three types of greenery, which are green landscape, green roofs and living walls as manifestations of biophilia in the Turkish urban context, representing an interaction between people and nature. Starting from various examples, the study explores the main social facts about biophilia and how people react to green elements.

There are three main stages in the study of ‘biophilia’ and how it is encountered in Turkey. Firstly, Turkish old and vernacular architectural examples are explored, focusing on how ‘biophilia’ was embedded in Ottoman architecture, in which researchers show that nature was a major parameter.

After investigating the past, the study focused on various contemporary examples with green features in Turkey. In addition, the study examines certain social aspects in relation of biophilia, mainly the public interaction with green buildings and green elements. The work included field studies on the interaction of the public with green building features, then questionnaires and interviews explored the views of some designers on the underlying reasons that instigate the application of biophilic elements in Turkey. The output of the multiple investigation was an interesting insight on how and why biophilia concepts are applied in the built environment, and also on the social response to the engagement with biophilia.

In most cultures, both present and past, one can observe behaviors and habits reflecting a fondness for nature. For example, tomb paintings from ancient Egypt, as well as remains found in the ruins of Pompeii, substantiate that people brought plants into their

houses and gardens more than 2,000 years ago. A tendency to add elements of Nature seems to be a universal human feature. Such behavior is, presumably, a manifestation of the biophilic quality of the human mind.

While the need for natural resources increases with industrialization and population growth, pressure on environment rises together with urbanization. Many parts of Turkey offer opportunities for sustainable development throughout physical planning decisions, improvements in infrastructure, mobilization and guidance of citizens. Within such frame, local administrations are supported legally and institutionally and the sustainable city concept is materialized with projects and programs. For example, there are some projects and organisations whose main aim is protecting the natural areas in İzmir. An additional approach is to promote public opinion against all activities that have a negative effect on the ecological balance.

In order for a project to be truly biophilic, it should include elements consciously inspired by the concept of 'biophilia'. While a project in a design concept phase, designing on ideology means to be honest both in terms of designer and prospective user. Seeing nature as a decorative component is a disrespect for both the user and the structure. If we consider any construction as a dead mass, independent of its systems, the main purpose in a pseudo-biophilic design is to revive a dead system. The basis of life is nature. Almost all our needs are satisfied by nature. The point most emphasized in the biophilic concept is that we can feel as a part of nature. In that design concept, all our senses are able to be stimulated by nature. The key idea is to be able to feel Nature, as opposed to just putting her into our service. Thorncrown Chapel (Fig. 30) is an example of integration with many elements of nature. The chapel consists of glazed walls and is completely surrounded by the forest. Transparency offers a direct contact with the natural environment around the chapel. The shrub trees appear to our perception as being indoors. Another similar example is Tadao Ando's "Church of the Light" (Fig. 31). Instead of seeing the natural elements directly, we can feel elements belonging to nature. As can be understood from these two examples, the main tendency is to incorporate elements of nature into our interior living space.



*Figure 30. Thorncrowne Chapel.  
E. Fay Jones - 1980*



*Figure 31. Church of Light.  
Tadao Ando - 1989.*

The participants in the surveys conducted for this study have a positive opinion on the green areas in the general context of cities. Likewise, 100% of respondents in the survey thought that green areas were a significant contributor to city identity and city image. This shows that people living in Turkey have a positive understanding of green areas. Again, the participants stated that the concrete structures due to the increasing population in the city had a negative effect on the green areas with more than 90%. The forest areas have positive effects on the soul and body health of the people and these green areas have positive effects on urban appearance and quality of urban life. People believe that problems arising from new construction in and around the city cause green areas to disappear.

According to the results of the survey, the benefits provided by the green areas are well known by the people in the cities of İzmir and Sivas, enabling them to have reasonable demands on these areas. This will help to raise the level of awareness on the essential functions of green spaces in the city and to create more appropriate policies to be formulated through the participatory approach. By protecting the existing green areas in Turkey, the amount of green space per capita can be increased and green areas can be organized for the benefit of citizens. These spaces also have an educative role on

society and an ecological meaning for the city. The ability of green spaces to create environments for all kinds of cultural activities will allow sharing of various information and communication with different cultures and will have an impact on community education.

In relation to the initial research questions, there are some answers. Firstly, biophilic concept is applied in Turkish architecture from past to now in many ways. According to scholars, nature was an important constituent in Ottoman architecture. Many architectural examples include elements of nature such as natural light, natural landscapes, water supply, etc. are revealing an innate biophilia. The architectural past supplemented by a number of contemporary examples with green elements, indicate that Turkey has a strong potential to accomplish a balance between nature and built environment.

The majority of people feel relaxed and happy in a biophilic setting, and they want to see more green elements in their built environment. According to the results of the surveys, the benefits provided by the green areas are well known to the people. The addition of a variety of plants and natural setups in the cities of İzmir and Sivas -and similarly to other urban centres- will satisfy people's demands. This will also help to increase awareness of the importance of green spaces and to create more concise policies formulated through a participatory approach.

Some designers are motivated by biophilia or sustainability. In practice many architects understand that green spaces are more user-friendly. Developers also realize that buildings with biophilic elements are more marketable.

In Izmir, there are signs that biophilic ideas have been put into practice. The local authority follows the desires of the people to provide a modern and green city and meet the outdoor green area needs of present and future generations.

In Sivas, the university administration has set new environmental guidelines. Academicians and students are trying to improve both, campus environment and their physical condition by working together within those guidelines.

It is important to realize that biophilia in the spatial design field is more than just a new way to make people more satisfied by applying an innovative technical tool. The successful application of biophilia in architecture fundamentally depends on adopting a new consciousness toward nature, recognizing how much our physical and mental wellbeing continues to rely on the quality of our connections to the natural world around us of which we still remain a part.



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## APPENDICES

### 1. QUESTIONNAIRE FOR PUBLIC

#### MODERN TÜRK MİMARISİNDE BİYOFİLİK ELEMANLAR

Bu anket formu yüksek lisans tezi kapsamında, modern Türkiye de ki biyofilik (bitkiler, yaşayan organizmalar, doğal elemanlar vb.) elemanların insanlar üzerindeki etkilerini araştırmak için duygu ve düşüncelerinizi belirlemek üzere hazırlanmıştır. Elde edilecek bilgiler tamamen bilimsel amaçlı kullanılacak olup, ankette isim belirtme gerekliliği bulunmamaktadır. Ankette yer alan sorulara içtenlikle yanıt vermeniz, araştırmanın bilimsel geçerliliği ve güvenilirliği açısından büyük önem taşımaktadır. Zaman ayırarak çalışmamıza katıldığınız için teşekkür ederiz.

1- Cinsiyetiniz?

- Erkek  Kadın

2- Yaş aralığınız?

- 18-25  26-35  36-45  45+

3- Eğitim durumunuz?

- İlkokul Mezunu  
 Ortaokul Mezunu/Devam Ediyor  
 Lise mezunu/Devam Ediyor  
 Ön Lisans/Lisans Mezunu/Devam Ediyor  
 Yüksek Lisans Mezunu/Devam Ediyor/ +

4- Ne tür bir evde yaşıyorsunuz?

- Apartman dairesi  
 Müstakil ev  
 Yazlık  
 Köy evi

5- Hayvanları seviyor musunuz?

- Hayır  Biraz  Çok

6- Evinizde hayvan besliyor musunuz?

- Hayır  Evet



7- Cevabınız evet ise; ne besliyorsunuz ve kaç tane?

8- Evinizde bitki var mıdır?

- Yok  Birkaç tane var  Çok var

9- Cevabınız evet ise; iç mekanda mı? Bahçenizde mi? Her iki alanda mı?

10- Bitkilerinizle kim ilgileniyor?

- Kendim ilgileniyorum.  
 Ailem ilgileniyor.  
 Profesyonel yardım alıyorum.  
 İlgilenilmiyor.

11- 3 bitki ismi yazabilir misiniz?

12- Bitkilerin şehre sağladıkları avantajlar ile ilgili olarak ne düşünüyorsunuz? (2 tanesini seçiniz)

- Güzelleştiriyor.  
 Temiz hava sağlıyor.  
 Serinlik yaratıyor.  
 Gölge sağlıyor.  
 Güzel koku sağlıyor.  
 Meyve veriyor.

13- Bitkilerin dezavantajları ile ilgili olarak ne düşünüyorsunuz? (2 tanesini seçiniz)

- Dağınıklık yaratıyor.  
 Fazla bakım istiyor.  
 Fazla yer kaplıyor.  
 Hayvanları/böcekleri kendine çekiyor.  
 Alerjiye sebep oluyor.

14- Birçok insan bitkilerin binaları güzelleştirdiğini düşünüyor. Katılıyor musunuz?

- Hayır  Biraz  Evet

15- Parklara/mesire alanlarına/kırsal yerlere/doğaya ne sıklıkla gidersiniz?

- Gitmem.  
 Bazen giderim.  
 Sıklıkla giderim.  
 Sürekli giderim.

16- İzmir'in hangi bölgesinde oturuyorsunuz?

17- Komşularınızın yeteri kadar bitkilere/yeşil alana sahip olduğunu düşünüyor musunuz?

- Yeterli  Yetersiz  Bilmiyorum

18- Binaların/kamusal alanların/iç mekânların yeşillendirilmesi sizin dikkatinizi çekiyor mu?

- Evet  Bazen  Hayır

19- Cevabınız evet ise; yeşillendirilmiş alanlarda nasıl hissediyorsunuz? (2 tanesini seçiniz)

- Huzurlu.  
 Karmaşık.  
 Mutlu.  
 Sağlıklı.  
 Huzursuz.

20- Yaşadığınız şehrin yeterli yeşil alana sahip olduğunu düşünüyor musunuz?

- Evet  Hayır  Bilmiyorum

21- Yeşil alanların kent kimliği oluşturmada ve kente/mekanlara imaj kazandırmada önemli katkısı vardır.

- Evet  Hayır

22- Yeşil alanlar bitki çeşitliliği ve doğal peyzaj değerleri bakımından kente ve binalara zenginlik katıyor.

Evet  Hayır

23- Şehrimizdeki kentsel gelişim mevcut yeşil alanların azalmasına sebep oluyor.

Evet  Hayır

24- Kentimizde yeşil alanların geliştirilmesi ve korunması ile ilgili mimari ve fonksiyonel planlar yetersizdir.

Evet  Hayır

25- Kent içerisinde bulunan yeşil alanları kent nüfusu için yetersiz düzeydedir.

Evet  Hayır

26- Kent çevresindeki zeytinlik ve bağlık alanları yeşil alan olarak kabul ediyorum.

Evet  Hayır

27- Kent gelişiminin yaşadığımız binalardaki yeşil alanları azalttığını düşünüyorum.

Evet  Hayır

28- Binaların daha çok yeşil alan barındırması gerektiğini düşünüyorum.

Evet  Hayır

29- Şehrimizde hem sosyal alanlarımızın hem binalarımızın daha çok yeşillendirilmeye başladığını düşünüyorum.

Evet  Hayır

30- Yaşam alanlarımızın daha yeşil hale getirilmesi için neler yapılabilir? (Lütfen düşüncelerinizi paylaşınız.)

## 2. QUESTIONNAIRE FOR DESIGNER

### ÇAĞDAŞ TÜRK MİMARİSİNDE BİYOFİLİNİN YERLERİ

Biyofilik tasarım, 1984 yılında biyolog E.O. Wilson tarafından önerilen 'biyofili' kelimesinin bir yansımasıdır. Hipotez, insanların yaşam alanlarının doğa ile temasa geçilmesi gerektiğinin altını çizmektedir. Biyofili kelimesi hem flora hem faunayı ilgilendiren 'hayat sevgisi' anlamına gelir. Tez, Türkiye'de canlı organizmalar ile yapılı çevre (mimari) arasındaki ilişkiyi ele alıyor. Bu sorular biyofili konusundaki tutumunuzu analiz etmek için hazırlanmıştır.

1. Yeşil/Doğal elemanların tasarımlarınızda ki rolü nedir? Ne tür uygulamalar kullanıyorsunuz? Bu elemanlar neden önemli?
2. Tasarımlarınızda yeşil elemanları kullanmanın en zorlu tarafı nedir?
3. Biyofilik tasarım/Yeşil tasarımlar ile ilgili konuşmalarınız ve/veya teşviklerinizde özellikle Türk mimarların tepkileri neler oluyor?
4. Genç mimarlara ( piyasaya yeni atılan tasarımcılara ) biyofilik tasarım hakkında ne önerileriniz olabilir?
5. Müşterileriniz yeşil elemanlar ile ilgili isteklerde bulunuyorlar mı? Yoksa bu sadece sizin teşviğiniz ile mi oluyor?
6. Eğer müşterileriniz bu yeşil elemanları uygulamanızı istiyorlarsa, bu sizin için ne kadar uygulanabilir oluyor?
7. Eğer müşterilerinizden çok sizin inisiyatifiniz ise müşterilerinizi ikna etmek ne kadar zor/kolay?
8. Yeşil elemanların uygulama maliyetinin yüksek olmasına rağmen müşterilerin bunu neden tercih ettiğini düşünüyorsunuz?
9. Yeşil elemanları uygularken temel kaygınız estetik sebepler mi yoksa ekolojik ve çevresel olması mı örneğin serinletme, gürültü önleme, yalıtım, ışığa karşı koruma, soft zemin oluşturma vs ?
10. Tasarımlarınıza yeşil alanlar uygularken bununla ilgili alanında uzmanlaşmış kişilere danışıyor musunuz?
11. Projelerinizde 'yapay' yeşil alanlar uyguladınız mı?
12. Uyguladığınız yeşil alanlara, o yapının kullanıcılarının veya ziyaretçilerinin tepkisini değerlendirecek olursak ne kadar pozitif geri dönüşler aldınız? Bir yüzde verecek olsanız bu % kaç olurdu?

Nergiz Amirova, Master student at Izmir University of Economics - Architecture  
Department, n\_amirova@yahoo.com