

An Evaluation in the Context of Biophilic Urbanism and Biophilic Design Approach: The Case of Mogan Park in Gölbaşı, Ankara

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Received: 23.02.2026
Accepted: 23.04.2026

Yıldırım Özcan, K.,
(2026). "An evaluation in
the context of biophilic
urbanism and biophilic
design approach: The
case of Mogan Park in
Gölbaşı, Ankara", *Mugla
Journal of Science and
Technology*, 12(1), 130-
143.
[www.doi.org/10.22531/
muglajsci.1895933](http://www.doi.org/10.22531/muglajsci.1895933)

Abstract

Today, the increasing population and urbanization rates worldwide have brought with them many urban and environmental problems. Therefore, while there are various approaches to urban and especially environmental problems in the literature, the concept of biophilia has come to the forefront in recent years. The concept of biophilia is fundamentally associated with love for nature and life. Biophilic urbanism and biophilic design, within this framework, can be linked to design and urbanization that are in harmony with nature and effective in increasing the health and happiness levels of individuals. Accordingly, this study aims to contribute to the conceptual clarification of biophilic urbanism and biophilic design through case-based analysis. In this context, a literature review on the subject was conducted, and face-to-face interviews were held with Ankara Metropolitan Municipality. In addition to all this, a survey was conducted with 100 people randomly selected from within Mogan Park. Subsequently, observations were conducted in Mogan Park and the collected data were analyzed. In conclusion, it can be said that Mogan Park contributes to the health and happiness levels of individuals using the park and that it was designed in accordance with biophilic design criteria.

Keywords: Biophilic urbanism, Biophilic design, Mogan Park

INTRODUCTION

With the advancement of technology, urbanization rates are increasing worldwide due to factors such as population growth and greater access to urban opportunities. This, in turn, contributes to the emergence of a wide variety of environmental and spatial problems. Furthermore, it is becoming increasingly difficult for individuals to cope with these problems, as well as other issues arising within the city. At this point, the biophilic design approach, which benefits both the city and its environment, as well as the people living in it, comes to the forefront. The number of studies on the biophilic design approach in the literature is quite limited. The aim of this study is to evaluate Ankara province and Mogan Park within the context of biophilic urbanism

and biophilic design approaches, and to shed light on future studies in this area.

Basically, the concept of biophilia expresses interest and respect for the natural system [1, 2]. The concept of Biophilia, which means love of life, was first used by Erich Fromm, a social psychologist, in his book *The Heart of Man* in the 1960s [3]. Bio means alive and life; philia means the connection of individuals to nature [2, 4]. The term 'Biophilia', derives from the Greek words 'philia' (love) and 'bios' (life or living things). [5, 6, 7].

The biophilic design approach was introduced by social ecology professor Stephen Kellert as a new framework to address the deficiencies in providing nature experiences in the built environment. The main purpose of this approach is to integrate natural elements into

the built environment to encourage human interaction with nature [8, 9].

Biophilic design differs from other environmental design approaches. While the aforementioned approaches generally focus on reducing the negative environmental impacts of the built environment, biophilic design focuses on increasing people's interaction with nature in the built environment and thus improving their physical and mental health [9, 10].

Encouraging a deeper sense of connection and responsibility to the natural world, connected, integrated and mutually reinforcing architectural solutions and emotional attachment to specific places and environments, focusing on improving people's health and well-being, enabling repeated and sustainable interaction with nature can be listed as the benefits of biophilic design [6, 9].

Improving the relationship with nature can reduce stress levels. For example, the presence of plants and other elements in the workplace increases employee productivity. Therefore, shades like green, brown, and blue, which are frequently found in nature, are effective in creating a feeling of comfort. Similarly, adequate lighting and spacious areas contribute to increasing the overall satisfaction level of employees [11, 12].

According to another study conducted at the University of Texas, using plants indoors was found to be effective in reducing employee stress levels and increasing work performance by approximately 12% [12, 13].

Another study conducted in 1993 with 1200 office workers found that those who could observe nature from their windows exhibited lower levels of dissatisfaction and higher motivation. A 1994 study by the Rocky Mountain Institute found that implementing energy-efficient systems for heating, cooling, and lighting had a positive impact on employee productivity, reduced absenteeism, and improved overall output quality. According to Cramer and Browning [14], a significant increase in productivity of between 6% and 16% was observed with this design change [12, 14].

The environmental impacts of biophilic design include beneficial effects such as biodiversity conservation, reduction of air and water pollution, flood prevention through rainwater runoff control, improvement of microclimate characteristics, reduction of the urban heat island effect, reduction of carbon emissions, and energy savings through green roofs [15, 16, 17, 18, 19, 20, 21].

Furthermore, biophilic design, which is effective in increasing success, motivation, productivity, and efficiency, also reduces urban crime and violence rates, which is effective in reducing economic losses. In addition to these, Biophilic design has psychological, physiological, environmental and economic effects. Biophilic design, which has psychological effects such as reducing stress, eliminating distraction, increasing working capacity and improving the mood, also has physiological effects. And also, biophilic design has different benefits such as improving problem-solving skills in people, increasing creativity, developing a sense and awareness of responsibility, and increasing motivation. Beside these benefits, Biophilic design also has positive effects on reducing crime rates. Another psychological effect of biophilic design is observed in low-income areas, where there is a decrease in mental fatigue and an increase in coping with poverty in individuals. When looking at the physiological effects of biophilic design, according to the findings obtained as a result of the study conducted by medical doctors Park and Mattson [28] conducted a study with 90 patients who underwent appendectomy and found that the plants used in the hospital were a complementary medicine for patients who were in the recovery phase after appendectomy. It was determined that patients with plants in their rooms had more regular blood pressure, requested less painkillers, and were more satisfied with their hospital rooms [6, 21, 22, 23, 24, 25, 26, 27, 28].

The biophilic design include beneficial environmental effects such as protecting biodiversity, reducing air and water pollution, preventing floods by controlling rainwater flow, improving microclimatic features, reducing the urban heat island effect, reducing the amount

of carbon gas, and saving energy with green roofs, etc. In addition, biophilic design, which is effective in increasing success, motivation, productivity and efficiency, also reduces urban crime and violence rates, which is effective in reducing economic damages [15, 16, 17, 18, 19, 20, 21, 22].

According to a consumer research conducted on stores selected from streets with various biophilic designs and elements, it was determined that there were differences in the preferences of customers in less densely vegetated streets and in densely vegetated streets, and that stores located on densely vegetated streets were preferred more, and that consumers who went shopping on these streets spent 25% more money than they planned and wandered around for longer periods of time [21, 29].

Kellert [8], defined two dimensions, six elements, and over 70 design attributes for biophilic design. This framework, which is considered the foundation of biophilic design, offers designers a wide range of options. In addition, Kellert and Calabrese [6] identified three experiences and 24 attributes for biophilic design practice, and this framework was also updated by Kellert [9, 10, 30].

According to Kellert [8], these dimensions are divided into six different topics;

1) Environmental features: It includes what people need to survive. These include; interacting with water, plants, animals, benefiting from the psychological effects of colors, daylight, using natural materials in structures and the environment, and having fire in the environment for needs such as food and heating. At this point, it is important to provide designs that are compatible with the landscape and geological features in the region [2, 31].

2) Natural Shapes and Forms: In addition to unsharpened lines, the use of forms and motifs that generally represent nature in designs such as plant and flower patterns is effective in creating warmer environments for people and making people feel more comfortable in these environments. In addition, from an aesthetic point of view, the use of structural elements such as vaults and

arches in designs is more preferred than sharper shapes and linear designs with sharper lines. In this design approach, the solutions produced by nature to the problems are imitated and transferred to the designs [2, 3].

3) Natural patterns and processes: Individuals remember symmetrical areas more easily and use certain centers and nodal points as reference points to perceive spaces. However, it is not possible to find symmetry in every area in nature. Therefore, it may be necessary to benefit from different patterns and processes within designs that are compatible with nature. In this direction, designs can be made by using symmetry, asymmetry, order, and contrasts. Using different patterns and processes together can also add dynamism, balance, and attractiveness to the design [2, 32].

4) Light and space: In both interior and exterior designs, establishing a balance by paying attention to the occupancy-emptiness ratio and using natural light can be effective in creating feelings of spaciousness and peace in people. At this point, it is important to use more glass products, especially in interior designs, and to allow more daylight to enter the interior. When looking at exterior designs, it is especially important to create courtyard structures and to position the structures in a way that they do not block each other's daylight. In this way, access to green areas in outdoor spaces can be provided more easily [2, 3].

5) Local relations: Designing spaces in line with regional and local characteristics is effective in developing a sense of belonging in individuals. Therefore, designs that are compatible with local and regional identity characteristics should be made by taking into account the geographical, cultural, climatic and ecological characteristics of the place where the space is located. Using local materials in the places where the spaces are located and making designs that are compatible with local and regional identity characteristics also help in developing relationships between people and nature [2, 31].

6) Evolved human-nature relationships: Providing a sense of privacy is as important as a sense of belonging in spatial designs. However, individuals should not lose touch with nature. Today, it is important to create rest areas in stressful daily life. Therefore, individuals' needs for shelter should be taken into consideration. These spatial designs, which are designed to meet individuals' needs for shelter, also bring the concept of mystery to the forefront [2, 3].

Biophilic Design Elements vary at the scales of region, community, district, street, block and building. At the scale of region; river systems and floodplains, coastal systems, regional green area systems and greening of major transportation corridors. At the scale of community; urban streams and coastal areas, urban ecological networks, green schools, urban tree canopy, community forests and orchards, and green public service corridors. Design elements at the neighborhood scale; daylighting and restoration of streams, forest parks, ecology parks, community parks, neighborhood and pocket parks, and greening of gray and brown areas. Design elements at the street scale; green streets, sidewalk gardens, urban trees, low-impact development, vegetated swales and skinny streets, edible landscaping and high degree of permeability. Design elements at the block scale; green courtyards, clustered housing around green areas, and native species yards and spaces. At the scale of building; Green rooftops, sky gardens and green atria, rooftop gardens, green walls and daylit interior spaces are included as design elements [1, 9].

Based on Beatley's study in 2011, Zari presented 30 different features used at different scales in the fields of urban planning, architecture and interior architecture in order to create a physical map and classified them under three main headings. These are; nature in the city, nature activities and the nature of spaces and places [1, 2, 33, 34].

When looking at the issue of nature in the city; ensuring biodiversity, increasing the interaction between individuals and nature and thus creating more livable and healthy urban areas, the existence of open green areas within the city and providing access to them,

creating rural landscapes and natural areas for wildlife in rural areas and also the protection of special natural areas are very important. The creation of urban parks, traffic island planting works, the creation of atriums, green roofs, facade greening and garden applications in buildings, pavement applications (cobblestone), the creation of rural tourism areas intertwined with nature, the creation of zoos and natural habitats can be given as examples of these. In addition, the use of water as an important element in urban planning and architecture as well as landscape designs stands out with its positive effects on people's health both physically and psychologically and on spaces, buildings and areas in terms of aesthetics [2, 34, 35]

Within the scope of nature activities; the establishment of camping, recreation and playgrounds, botanical gardens, gastronomy units with open green areas, the activities of nature-related associations, environmental education, as well as the production of protection projects, as a result of providing access to these areas and units for city dwellers and their participation in nature-related events and activities, the relationship and interaction between humans and nature is increasing [2, 34].

Within the context of the Nature of Spaces and Places: Biophilic design is known to have an impact on improving people's health and well-being. From this perspective, maintaining and ensuring the balance between nature and humanity in a space requires creating different emotions and feelings in individuals, such as mystery, discovery, and curiosity, adding dynamism and appeal to designs. In this context, it is necessary to create biomorphic and bioclimatic structures and spaces, utilize daylight and local materials, and create air corridors and healthy airflow. In addition to all this, it is also important that the colors used in the designs are in harmony with nature [2, 8, 34, 36].

The Biophilic Cities Network defines the indicators of a biophilic city as follows:

1- Green space per capita

- 2- Number of trees and plants planted
- 3- Number of activities in green areas
- 4- Number of events associated with biophilic traits
- 5- Number of trainings on climate change and environmental protection in the Biophilic Cities Network Website. And also, from Türkiye, only İzmir Karşıyaka is in the Biophilic Cities Network. The network was launched in 2013. Biophilic Cities, in general, facilitates a global network of partner cities working collectively to pursue the vision of a natureful city [37].

Also within the subject of Nature of Spaces and Places: It is known that biophilic design has an effect on improving people's health and making them feel good. From this point of view, in order to maintain and ensure the balance of the space with the relationship between nature and humans, creating different emotions as well as feelings such as mystery, discovery and curiosity in individuals adds dynamism and appeal to designs. In this context, it is necessary to create biomorphic and bioclimatic structures and spaces, use daylight and local materials, create air corridors and healthy air flow. In addition to all these, the colors used in the designs should be in harmony with nature [2, 8, 34, 36].

DATA AND EVALUATION OF OBTAINED DATA REGARDING ANKARA, GÖLBAŞI DISTRICT AND MOGAN PARK WITHIN THE CONTEXT OF BIOPHILIC URBANISM

Currently, Ankara has a total of 6,358,924 m² of green space [38]. Tables 1 and 2 show that the total amount of green space within the city decreased between 2015 and 2025, while the total city population continued to increase.

Table 1. Total green space amounts (in square meters) for Ankara districts over the years

Municipalities	2010	2011	2012	2013	2014	2015
Altındağ	551,259	651,497	1,060,266	1,536,778	1,546,185	1,718,911
Çankaya	966,635	982,035	1,221,398	1,221,398	2,296,395	2,296,395
Keçiören	2.422.145	2.422.145	2.677.705	3.580.565	3.611.007	1.784.910

Mamak	3.493.399	3.688.726	4.521.305	4.667.707	4.857.475	5.051.126
Yenimahalle	2.075.265	2.291.873	2.291.873	2.291.873	2.869.892	1.993.369
Sincan	5.503.362	6.005.233	7.664.102	4.405.458	7.819.441	6.004.378
Etimesgut	832.094	1.031.280	1.177.689	1.501.103	1.606.238	1.929.664
Gölbaşı	19.279.123	16.655.518	12.210.000	12.210.000	27.375.025	1.024.000
Pursaklar	351.099	492.108	437.796	437.796	707.22	800.000
Ayaş	278.110	215.500	206.550	20.000	22.000	213.387
Akyurt	622.271	1.339.201	1.457.706	1.518.849	1.639.201	1.653.920
Bala	78.750	78.750	78.750	78.750	78.750	65.926
Çubuk	2.471.222	2.471.222	2.471.222	795.359	414.785	328.038
Kalecik	62.900	232.450	232.450	232.450	229.450	232.450
Kazan	1,179,657	1,266,016	1,266,016	279,751	885,710	459,131
Elmadağ	890,266	5,605,813	11,602,943	11,602,943	648,685	4,902,336
Çamlıdere	.....	.....	.....	.....	238,068	274,297
Kızılcahamam	.....	.....	.....	.....	489,570	492,560
Güdül	.....	.....	.....	.....	535,692	314,000
Evren	.....	.....	.....	.....	.....	4,407,500
Beypazarı	.....	.....	.....	.....	.....	1,310,000
Polatlı	.....	.....	.....	.....	.....	930,933
Şereflikoçhisar	.....	.....	.....	.....	.....	349,437
Nallıhan	.....	.....	.....	.....	.....	891,042
Haymana	.....	.....	.....	.....	.....	11,513
Total	41,057,557	45,429,366	50,577,771	46,380,780	57,163,569	39,439,223

Source: Ankara Metropolitan Municipality Environmental Protection and Control Department, Personal Communication, February 10, 2017.

Table 2. Population of Ankara's districts between 2010-2015

Districts	2010	2011	2012	2013	2014	2015
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Akyurt	26,006	26,780	27,201	28,349	29,403	30,245
Altındağ	365,920	365,915	363,744	359,597	361,259	363,687
Ayaş	13,291	13,166	13,087	12,997	13,018	12,678
Bala	19,426	18,861	17,397	23,138	22,142	21,618
Beypazarı	46,493	47,018	46,738	47,234	47,646	47,582
Çamlıdere	7,297	6,993	6,739	7,181	6,781	6,479
Çankaya	797,109	813,339	832,075	914,501	913,715	922,536
Çubuk	81,747	82,156	82,614	83,449	84,636	86,055
Elmadağ	43,311	44,140	43,856	43,873	43,666	43,776
Etimesgut	386,879	414,739	425,947	469,626	501,351	527,959
Evren	3,343	3,227	3,011	2,995	2,901	2,847
Gölbaşı	95,109	105,006	110,643	115,924	118,346	122,288
Güdül	8,971	8,891	8,656	8,921	8,626	8,392
Haymana	33,886	32,705	31,058	42,566	31,176	28,355
Kalecik	14,517	13,969	13,648	13,678	13,604	13,388
Kazan	39,537	42,090	43,308	45,879	47,224	51,764
Keçiören	817,262	831,229	840,809	848,305	872,025	889,876
Kızılcahamam	25,203	24,966	24,635	26,694	25,767	25,179
Mamak	549,585	558,223	559,597	568,396	587,565	607,878
Nallıhan	30,571	30,351	30,299	29,797	29,289	29,209
Polatlı	117,473	119,510	119,349	117,393	121,101	121,858
Pursaklar	108,211	114,833	119,593	123,857	129,152	133,961
Şereflikoçhisar	35,989	36,071	35,042	34,577	33,946	33,729
Sincan	456,420	468,129	479,454	484,694	497,516	506,950
Yenimahalle	648,160	668,586	687,042	591,462	608,217	632,286
Total	4,771,716	4,890,893	4,965,542	5,045,083	5,150,072	5,270,575

Source: TÜİK, <http://www.tuik.gov.tr/>, (accessed Feb 17, 2017).

Table 3: Population growth of Gölbaşı district of Ankara over the years (person)

2007	73,670
2008	85,499
2009	88,480
2010	95,109
2011	105,006
2012	110,643
2013	115,924
2014	118,346
2015	122,288
2016	123,681
2017	130,363
2018	134,378
2019	138,944
2020	140,649
2021	142,961
2022	150,047
2023	157,605
2024	165,201

Source: TÜİK, <https://biruni.tuik.gov.tr/>, (accessed Jan 01, 2026).

As shown in Tables 4, 5, and 6, the ratio of the municipal population served by the sewage network to the total municipal population, the ratio of the municipal population served by the drinking and utility water network to the total municipal population (%), and the ratio of the municipal population served by waste services to the total municipal population (%) are all above 95% in Ankara.

Table 4: The ratio of the municipal population served by Ankara's sewage network to the total municipal population over the years (%)

2001	96
2002	98
2003	99
2004	98
2006	98
2008	99
2010	100
2012	100
2014	96
2016	96
2018	100

2020	98
2022	98

Source: TÜİK, <https://biruni.tuik.gov.tr/>, (accessed Jan 01, 2026).

Table 5: The ratio of the municipal population served by the drinking and utility water network to the total municipal population in Ankara over the years (%)

2001	98
2002	99
2003	99
2004	100
2006	99
2008	100
2010	98
2012	100
2014	99
2016	100
2018	99
2020	99
2022	99

Source: TÜİK, <https://biruni.tuik.gov.tr/>, (accessed Jan 01, 2026).

Table 6: The ratio of the municipal population served by waste management services to the total municipal population in Ankara over the years (%)

2001	99
2002	100
2003	100
2004	100
2006	99
2008	100
2010	100
2012	100
2014	99
2016	100
2018	100
2020	100
2022	100
2024	100

Source: TÜİK, <https://biruni.tuik.gov.tr/>, (accessed Jan 01, 2026).

As can be seen from Tables 7, 8, and 9, when looking at the general level of happiness in

Ankara, it is understood that the number of happy people is higher, and most people are satisfied with the amount of green spaces belonging to the municipalities. In addition, it can be said that the rate of interest in environmental and nature issues is high in the province.

Table 7. General happiness level in Ankara in 2013 (%)

1. (very happy)	10,64
2. (happy)	45,59
3. (neither happy nor unhappy, in the middle)	33,82
4. (unhappy)	7,42
5. (very unhappy)	2,54

Source: TÜİK, <https://biruni.tuik.gov.tr/>, (accessed Jan 01, 2026).

Table 8: Satisfaction rate of individuals regarding the amount of green spaces owned by municipalities in Ankara in 2013 (%)

1. (very satisfied)	2,26
2. (satisfied)	59,08
3. (neither satisfied nor not satisfied, in the middle)	9,23
4. (not satisfied)	21,82
5. (not satisfied at all)	4,81

Source: TÜİK, <https://biruni.tuik.gov.tr/>, (accessed Jan 01, 2026).

Table 9: The rate of interest of people in environmental and nature issues in Ankara in 2013 (%)

1. (relevant)	52,84
2. (neither relevant nor irrelevant, in the middle)	23,52
3. (irrelevant)	22,49

Source: TÜİK, <https://biruni.tuik.gov.tr/>, (accessed Jan 01, 2026).

METHODOLOGY

Mogan Park in Ankara, selected as the sample area for this study, was evaluated within the framework of biophilic design criteria. Within the scope of this study, data related to the subject were obtained from the relevant

literature, the Ankara Metropolitan Municipality website, and the Turkish Statistical Institute (TÜİK) website. Additionally, other relevant data were obtained through face-to-face interviews in 2017 with the Ankara Metropolitan Municipality Environmental Protection and Control Department. In addition, a survey was conducted in 2019 with 100 people randomly selected from within Mogan Park, which was chosen as the sample area. The decision to limit the survey to 100 people, randomly selected from different locations within the park on different days, was influenced by the fact that some Mogan Park users did not want to answer the survey questions, and this would have extended the study period. The survey was conducted using a multiple-choice question method. Multiple-choice questions were evaluated using a Likert scale (e.g., 1=very satisfied, 2=satisfied, 3=partially satisfied, 4=not satisfied, 5=not satisfied at all). Based on all the data obtained and observations made between 2017 and 2019 in Mogan Park, which was selected as the sample area, evaluations were made within the scope of biophilic urbanism and biophilic design criteria.

SOME LARGE URBAN RECREATION AND PARK AREAS LOCATED IN ANKARA

Based on face-to-face meetings held with the Ankara Metropolitan Municipality Environmental Protection and Control Department in 2017, when considering large open green spaces in Ankara, Altınpark covers an area of 640,000 square meters, with 85% dedicated to green spaces and ponds, and 15% to buildings and squares. Used as a golf club until 1977, the area was transformed into its current form in 1985 with the implementation of a winning project from a competition. Besides being a modern park with its social facilities and activities, Altınpark boasts many firsts in Türkiye, including a science center, an international-standard exhibition and congress center, a kindergarten and summer school, an international-standard Olympic swimming pool, cafes and restaurants, musical and illuminated water shows, play and entertainment areas, lakeside amphitheatres, boats, bumper boats, electric

sightseeing cars, a mini sightseeing train, horses, horse-drawn carriages, and parking areas. The amount of green space in Altınpark is 261,160 square meters, the children's playground is 2,070 square meters, the pond area is 32,700 square meters, the amount of hard surface is 149,362 square meters, the flowerbed area is 9,302 square meters, the shrub area is 46,758 square meters, the soil area is 56,462 square meters, the number of trees is 17,466, and the number of shrubs is 81,050.

Wonderland was awarded first prize in the Urban Beautification Projects category by the Organization of Islamic Capitals and Cities (OICC) in 2000. This project, which began in 1998 and was completed in 2003, was opened to the public of Ankara on October 5, 2003. Designed as a residential area, the site was acquired from the Ministry of Public Works, and the first step of the project was the planting of trees and saplings. Wonderland includes entertainment, relaxation, and picnic areas, as well as spaces for sports activities. Also known as Sincan Yunus Göleti, Wonderland is a large urban park designed to meet the needs of Ankara residents. Four times the size of Gençlik Parkı and twice the size of Altınpark, Wonderland is built on an area of 1,200,000 square meters. The area includes 532,833 square meters of green space, 274,004 square meters of walking paths, 98,301 square meters of pond area, 14,121 square meters of picnic area, 67,623 square meters of building area, 41,000 square meters of parking area, and 9,569 square meters of flower area. Designed within a chain of open, closed, and semi-open spaces, Wonderland features a 2,800 square meter indoor wedding hall with a capacity of 550 people, the 6,500 square meter indoor Nejat Uygur Amphitheater with a capacity of 5,000 people, an indoor sports hall, a youth center, a semi-Olympic indoor swimming pool, a semi-open football field, a basketball court, a volleyball court, a pool and rehabilitation center for people with disabilities, a model airplane and go-kart track, a mini-golf area, a country café, cafes, a restaurant, tea gardens, a nomadic tent, children's playgrounds, and a cultural center. Additionally, the Fairy Tale Island within the area contains models of 178

cartoon figures. Wonderland, built on a barren area, has been planted with 70,000 trees, 500,000 shrubs, and millions of flowers.

The Dikmen Valley Project, another project in Ankara, was awarded first place in the Urban Transformation Project category by the Organization of Islamic Capitals and Cities (OICC) in 2000. Designed as a multi-purpose urban renewal and development project, the Dikmen Valley Project is a significant urban transformation project in terms of both planning and investment scale, as well as resource allocation. By creating a 5-kilometer-long recreation area along with cultural and entertainment areas, a significant valley of Ankara has been transformed into a recreation area on an urban scale. The Valley consists of Stages I, II, III, IV, and V. Stage I began on May 1, 1995, and opened to the public on September 15, 1996. Stage II began on September 27, 2000, and opened to the public on June 11, 2002. Stage III, a recreation and cultural park, began on April 1, 2008, and is nearing completion. Stages IV and V are currently in the project phase.

In the Valley Project, classical expropriation methods were not sufficient; agreements were reached with informal settlement owners who met the necessary conditions under Law No. 2981 on Zoning Amnesty, on the condition that they would receive housing within the project area in exchange for their properties. Housing was delivered to the owners of Phase I in 1994 and to the owners of Phase II in 2003. Phases I and II of Dikmen Valley are built on an area of 387,337 square meters. The first and second phases of Dikmen Valley are built on an area of 387,337 square meters. This includes 259,955 square meters of green space, 87,490 square meters of paved areas, 1,050 square meters of children's playground, 31,394 square meters of pool area, and 7,448 square meters of flowerbeds. Cultural bridges have been created in these phases, including exhibition halls, meeting rooms, and areas for cultural and social activities. The third phase of Dikmen Valley covers an area of 320,000 square meters. This phase includes 200,000 square meters of green space and 120,000 square meters of paved and structural areas, as well as an 800-meter bicycle path. Additionally, the length of the constructed pool

is 1,800 meters. A children's village is also located within the valley. The village occupies an area of 6,800 square meters. This area includes a bird-shaped gazebo, a fairytale house, a play tower, a play ship, a play castle, a children's cafe, and a grass amphitheater with a capacity of 150 people. Also within the valley are a 40-meter-long and 12-meter-high climbing wall, three viewing terraces, three observation terraces, a 120-square-meter table tennis area, sports and fitness fields, cafes, activity squares, and a parking area.

According to data obtained from face-to-face meetings with the Ankara Metropolitan Municipality Environmental Protection and Control Department, Göksu Park was completed and opened to the public on July 5, 2003, in a short period of 100 days. Covering an area of 508,000 square meters, Göksu Park includes 201,213 square meters of green space, 121,158 square meters of walking paths, 141,125 square meters of pond area, 2,281 square meters of children's playground, 13,000 square meters of picnic area, 7,739 square meters of flowerbeds, 5,050 square meters of sports area, and 23,850 square meters of parking area. The neglected reeds around the natural lake were cleared, and 98,700 trees and shrubs were planted on the 201,213 square meters of green space. In terms of biodiversity, cormorants, birds, and ducks can be seen in and around the lake. Additionally, food and beverage outlets can be found around the lake. The park features facilities used for social, cultural, and sporting purposes, including: the Sailing Cascade Island Restaurant, the Hill Restaurant, tea gardens, a 1.6 km long wooden walkway, a 610-meter running track, nine floating piers, a lighthouse offering panoramic views, 700 barbecue and gazebo stalls, 75 fountains, a Mississippi boat for sightseeing on the lake, an amphitheater, a bio-sphere, a miniature castle, a go-kart track, football, basketball, and volleyball courts, a beach volleyball area, and fitness areas. Furthermore, the park houses Turkey's first and the world's fourth largest mountain sledding track, covering an area of 3,350 square meters. And the sleds can reach the speed of 70 km/h.

In addition to all this, the Bayındır Dam, which for a long time met Ankara's drinking water

needs, eventually became insufficient, and the area was transferred from DSİ to the Ankara Metropolitan Municipality. Reconstructed and transformed into a large recreational area, it was named Mavi Göl Park (Blue Lake Park), inspired by the color of the water in the dam, and opened to the public on October 1, 2005. Thus, recreational, leisure, and picnic areas were created on the eastern side of the city. The lake contains approximately 6.5 million cubic meters of water. Mavi Göl Park is structured on an area of 1,788,038 square meters. Within this area, there are 85,000 square meters of green space, 180,000 square meters of paved areas, 1,311,245 square meters of picnic areas, 200,301 square meters of reed beds, and 601,423 square meters of water area. To protect the biodiversity around the lake, the area surrounding Mavi Göl is enclosed with wire mesh fences. In the Blue Lake Park area, over 35,000 seasonal plants, more than 10,000 trees of various species, and over 11,000 shrub seedlings have been planted. The area includes picnic areas, a horse riding arena, children's playgrounds, a marina and piers, vehicle and pedestrian paths, a tea garden, viewing terraces, boat tours, water sports, basketball and football fields, a mini-golf area, barbecues, pergolas, and gazebos.

The Northern Star project, built as part of the Northern Ankara Urban Transformation Project, covers an area of approximately 700,000 square meters. Within this area, there are 400,000 square meters of green space and social facilities including a 5,000-seat amphitheater, restaurants, cafes, buffets, activity and cultural centers, two outdoor fitness areas, a presentation and exhibition hall, a wedding hall, a sports center, a guesthouse, and a reception hall, totaling 70 service buildings. Schools, a mosque, and health centers are also being constructed. In addition, there are two children's playgrounds totaling 2,250 square meters. Furthermore, shopping and commercial centers and five-star hotels will be built in the area. Additionally, the recreation area has a total parking capacity of 817 vehicles; and 76,000 trees, 4,000 saplings, 5,000,000 shrubs, and 46,000 seasonal flowers have been planted in the area. The 270,000 square meter area is

covered with lawns and features 23 pools and artificial ponds of varying sizes.

Another park in Ankara, Gençlik Parkı, is an urban park designed by Prof. Dr. Hemann Jansen in accordance with the wishes of the founders and administrators of the Republic, as outlined in the Ankara Urban Development Plan approved and finalized in 1932. Jansen planned an urban park for a population of 300,000 people in an area of approximately 275,000 square meters. The park is located between Ankara Station, Cumhuriyet Square, and Station-Samanpazarı Street. Gençlik Parkı was planned in an east-west direction opposite the station at that time, and was situated at a point that welcomed newcomers to the city. The plans for Gençlik Parkı, which opened on May 19, 1943, were completed in 1935. Located within Gençlik Parkı, which previously hosted swimming, sailing, and rowing competitions, the new complex now houses the Ankara Metropolitan Municipality Theatre Stage (434 square meters), the Youth Center (2,205 square meters of indoor space), and the Culture Center Building (2,670 square meters of indoor space). Within the park, near the train station entrance, there is an underground parking garage with a capacity of 93 vehicles and a covered area of 2,800 square meters. The park also has two open-air parking areas. One is in front of the cultural center building with a capacity of 80 vehicles, and the other is located behind the Municipal Reception Hall and in front of the amusement park, with a capacity of 309 vehicles. The Municipal Reception Hall within the park is a building with a covered area of 1985 square meters, featuring unique Turkish architecture, where municipal guests are received. The park's paved areas and walkways cover 114,000 square meters, the total building area is 12,000 square meters, the pool area is 42,000 square meters, and the net green area is 107,000 square meters. Finally, the park includes a Children's Play Center. This center includes a large play area and a play area for children with disabilities.

Finally, according to data obtained from face-to-face interviews; Mogan Park is situated around a lake and has been designed without disturbing the wildlife living in the area. Many rare and endangered bird species inhabit the

lake's surroundings. Mogan Park opened to the public on July 2, 2005. Within the park, a 203,650 square meter area designated as a "Nature Park" provides a breeding and nesting ground for endangered birds. A Bird Observatory has been built to observe these birds, and a 1.3 km long wooden walkway has been constructed to provide pedestrian access. Mogan Park is structured on an area of 958,968 square meters and includes 310,247 square meters of green space, 216,425 square meters of paved areas, 3,771 square meters of children's playground, 2,022 square meters of pool area, 99,972 square meters of soil area, 321,000 square meters of reed beds, and approximately 4 km of wooden platform walking paths. Mogan Park also includes; roads, children's playgrounds, piers, picnic areas, a horse riding arena, a baby car and mini car track, a wedding hall, an amphitheater, cafes, viewing terraces, sports fields, a pet shelter and a lighthouse.

SURVEY RESULTS AND FINDINGS

A survey was conducted with 100 randomly selected individuals in Mogan Park, located in the Gölbaşı district of Ankara. The data obtained from this study, as seen in Figures 1, 2, 3, 4, 5, 6, and 7, indicates that the majority of individuals are satisfied with the functions and features of Mogan Park, the number and quality of facilities, the amount of green space, the protection of biodiversity and natural resources, and the cleanliness and security services. Also, Figures 8, 9, and 10 show that Mogan Park significantly contributes to the happiness, stress reduction, and health of the individuals.

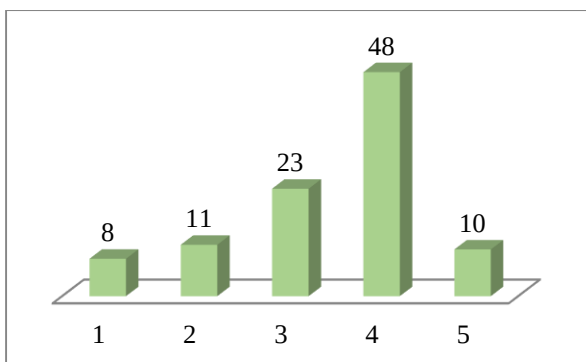


Figure 1. Satisfaction level with the functions and features in Mogan Park (%)

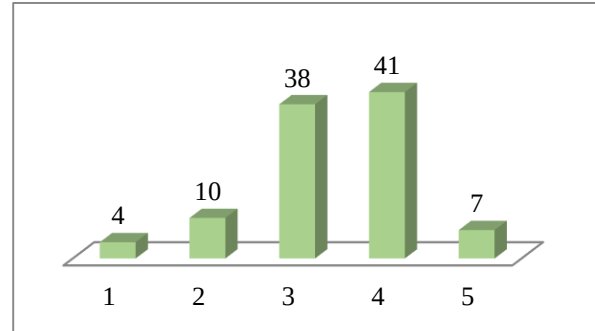


Figure 2. Satisfaction level regarding the number and quality of facilities in Mogan Park (%)

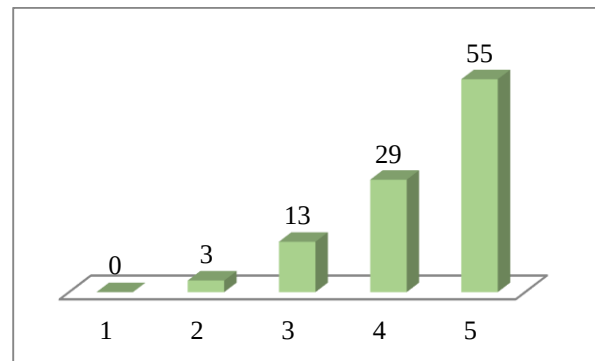


Figure 3. Satisfaction rate regarding the amount of green space in Mogan Park (%)

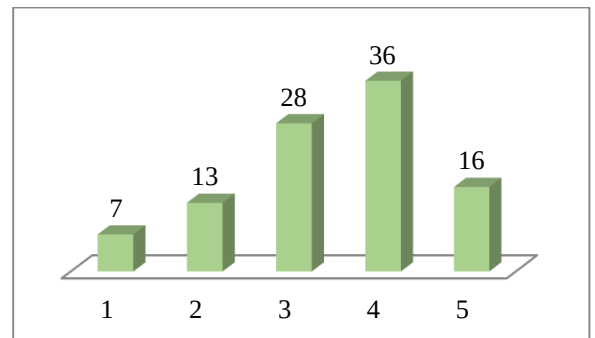


Figure 4. Satisfaction level regarding the conservation of biodiversity in Mogan Park (%)

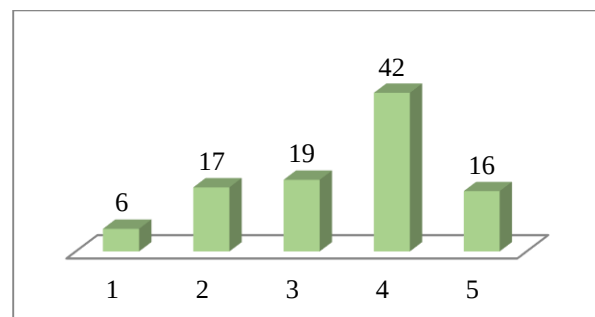


Figure 5. Satisfaction level regarding the protection of natural resources in Mogan Park (%)

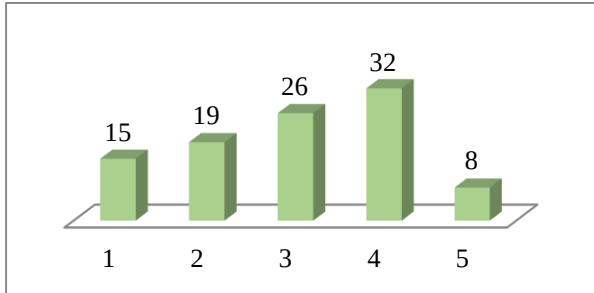


Figure 6. Satisfaction rate with cleaning services at Mogan Park (%)

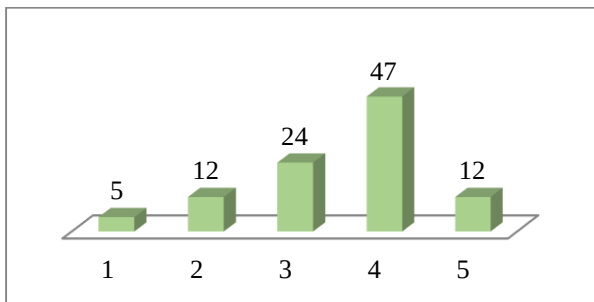


Figure 7. Satisfaction level with security services in Mogan Park (%)

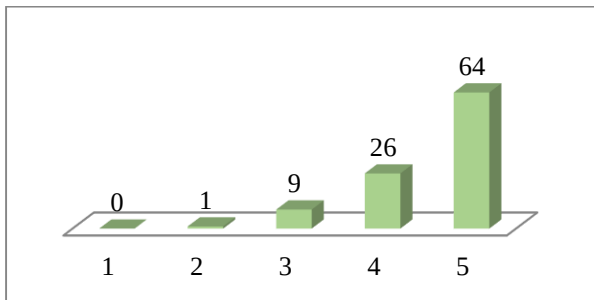


Figure 8. Mogan Park's contribution to people's happiness (%)

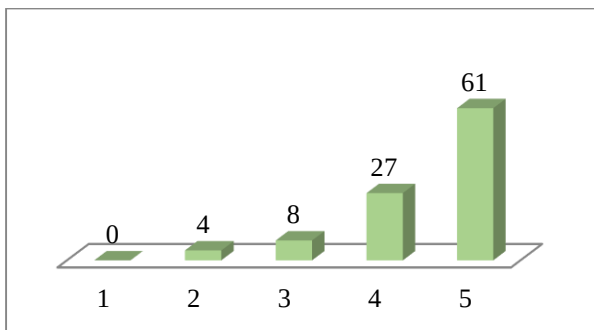


Figure 9. Mogan Park's contribution to reducing people's stress levels (%)

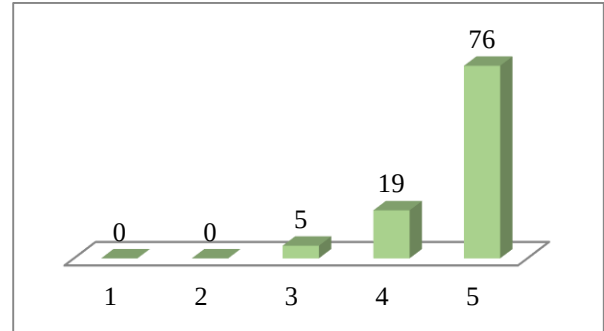


Figure 10. Mogan Park's contribution to people's health (%)

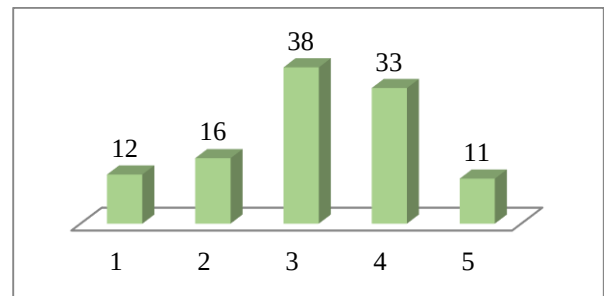


Figure 11. Participation rate of individuals in education, events and/or activities related to nature and the environment (%)

CONCLUSION

In the context of biophilic urbanism and biophilic design concepts, increasing the amount of green space can be effective in improving people's relationship with nature and their life satisfaction. At this point, based on the analyses of data obtained from research, face-to-face interviews, and surveys conducted with 100 randomly selected Mogan Park users as a sample, it is seen that the amount of green space in Ankara creates satisfaction among individuals, and Mogan Park significantly contributes to their happiness, health, and stress reduction levels.

The study concluded that increasing training, events, and activities within the framework of biophilic urbanism and biophilic design concepts can contribute to reducing urban and environmental problems and increasing people's capacity to cope with these problems.

This study has limitations due to the lack of available data regarding biophilic urbanism and biophilic design criteria found in the literature. However, as it is one of the rare

studies conducted in Ankara on biophilic urbanism and biophilic design approaches, it is expected to shed light on future research.

Ethics Approval and Consent to Participate: Ethical approval was not required.

Competing Interests: The authors declare no competing interests.

Funding: This research received no external funding.

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