

EDITOR

Prof. Dr. Murat DAL

**LANDSCAPE
ARCHITECTURE**

Researches and Evaluations in the Field of

**December
2024**

İmtiyaz Sahibi / Yaşar Hız
Yayına Hazırlayan / Gece Kitaplığı
Birinci Basım / Aralık 2024 - Ankara
ISBN / 978-625-7268-98-1

© copyright

2024, Bu kitabın tüm yayın hakları Gece Kitaplığı'na aittir.
Kaynak gösterilmeden alıntı yapılamaz, izin almadan hiçbir
yolla çoğaltılamaz.

Gece Kitaplığı

Kızılay Mah. Fevzi Çakmak 1. Sokak
Ümit Apt No: 22/A Çankaya/ANKARA
0312 384 80 40
www.gecekitapligi.com / gecekitapligi@gmail.com

Baskı & Cilt

Bizim Büro
Sertifika No: 42488

RESEARCHES AND EVALUATIONS
IN THE FIELD OF
LANDSCAPE ARCHITECTURE

EDITOR
Prof. Dr. Murat DAL

CONTENTS

CHAPTER 1

ECONOMIC FUNCTIONS AND BENEFITS OF URBAN GREEN BELTS

Elif BAYRAMOĞLU, Mahmut M. BAYRAMOĞLU 7

CHAPTER 2

EVALUATION OF HOUSING ENVIRONMENTAL DESIGNS WITHIN THE SCOPE OF DISASTER-SENSITIVE OPEN GREEN SPACE PLANNING

Elif BAYRAMOĞLU, Nida KURAK 21



CHAPTER 1

ECONOMIC FUNCTIONS AND BENEFITS OF URBAN GREEN BELTS

*Elif BAYRAMOĞLU¹,
Mahmut M. BAYRAMOĞLU²*

1 Prof. Dr, Karadeniz Technical University, Faculty of Forestry, Department of Landscape Architecture, Trabzon / Turkey, elifsol_@hotmail.com, 0000-0002-6757-7766

2 Assoc. Prof. Dr., Karadeniz Technical University, Faculty of Forestry, Department of Forest Engineering, Trabzon / Turkey, mahmudtr@gmail.com, 0000-0002-0870-5094

1.INTRODUCTION

Urban open spaces(Figure 1) are lands that create physical boundaries and enable the continuation of both the natural structure and landscape features of cities. Green spaces are generally intended for different land uses within the urban fabric. They are public or private property areas planned for multiple purposes (Düzenli et al., 2018). The urban open and green space system has emerged as a result of the systematic spatial planning of open and green spaces in the city and its immediate surroundings. The urban open and green space system consists of upper scales, such as regional and national (Önder & Öztürk Kurtaslan, 2009; Toksoy & Bayramoğlu, 2020). Many different types of open and green space systems can be mentioned. These appear in forms such as green belt, green wedge, green network, green heart. Today, in order to prevent the uncontrolled expansion of cities, the immediate vicinity of the city is surrounded by greenery. These areas are called green belts. These areas are areas that the people of the city can reach and benefit from in a short distance.



Figure 1. Urban Open Green Space (Url-1;Url-2)

It was developed by Mc Harg. Mc Harg is one of the best practitioners of the ecological approach to planning in the development of the spatial framework of open spaces. It is a method for determining priorities based on natural processes for development. It is of great importance in terms of landscape planning as well as in terms of green belt, which is an open space planning tool (Çulcuoğlu, 1997). Green belts are boundary elements in cities. They can be defined as large and permanent open spaces surrounding

residential areas. Green belt systems have many purposes. In urban and regional scales, especially the limits of the uncontrolled development and expansion of the city. It prevents the merging of two neighboring settlements, protects the character of the city, evaluates open spaces outside the city in line with recreational needs, protects agricultural areas and ensures that existing open spaces are protected from deterioration (Korgavuş & Ersoy, 2015).

Green belts are natural boundaries. They are large open spaces surrounding a region or city whose development is desired to be limited. They can be defined as a part of the urban fabric. Green belts protect rural areas around cities. They provide a transition from the city to the countryside. Green Belt applications protect rural areas around cities. At the same time, they protect people from various noise and visual pollution. They allow them to embrace nature and meet different recreational needs. In cities located in arid and semi-arid areas, they play a vital role in preventing the effects of wind erosion (Çelik, 2005; Dirik & Ata, 2005).

Urban green belts not only provide aesthetic and environmental benefits, but also contribute greatly to cities economically (Toksoy et al., 2010). Benefits such as increased real estate values, decreased health expenditures, increased tourism revenues and energy savings emphasize the importance and value of these areas. Therefore, increasing green belts in urban planning is a critical step for a sustainable and economically healthy future. The creation and protection of open green areas such as green belts, natural areas and parks in cities create significant economic effects. They have various economic functions and benefits, especially helping to reduce the negative effects of urbanization and improving the quality of urban life.

1.1.Function-Benefits of Green Belts in Urban Areas

The first green belt study was carried out by Elizabeth I in 1580. The purpose of the green belt during this period was stated to be economic reasons. It was stated as ensuring the abundance of cheap food and reducing the effect of infectious and lethal disease epidemics. The first green belt city was planned by Ledoux in the 17th century as the City of Chaux in France. In the plan, trees replaced the traditional city walls. (Çulcuoğlu, 1997). Towards the end of the 20th century, the rapid development and construction of the city of London began. Therefore, the need for green areas increased, and the necessity of protecting the aesthetics of recreational open areas emerged. Thus, two types of protective ideas emerged. The first of these is the protection of expressways and green grids in other European cities (well-known in the United States, in and around the city). The second is the establishment of Garden Cities by Ebenezer Howard and his followers as attractive rural areas around cities (Çelik, 2005).

Over time, the need for green areas increased in terms of recreation and aesthetics. However, two kinds of ideas have emerged. The first of these ideas was the protection of green grids created in and around cities in Europe and the United States. The second is Ebenezer Howard's idea. Ebenezer Howard formed the basis of today's green belt concept. It is the idea of creating rural areas that will be made attractive around the city. Later, the "Garden City" model emerged. The concept of "Garden City" has emerged. It analyzes the advantages and disadvantages of urban areas and rural areas on people. In this context, it is an approach that combines the advantages of self-sufficient, rural and urban life. Over time, the need for green areas in terms of recreation and aesthetics has increased. However, two kinds of ideas have emerged. The concept of "Garden City" analyzes the advantages and disadvantages of urban areas and rural areas on people. In this context, it is an approach that combines the advantages of self-sufficient, rural and urban life (Howard, 1965; Çelik, 2005).

- **Green Belt Model of the City of London:** The Green Belt Model of the City of London is an important example in the field of urban planning and environmental protection. This model is a strategy that provides for the creation of a wide green area corridor around London (Figure 2). This area, known as the green belt, is a region that surrounds the city, generally consisting of agricultural lands, parks, forests and open spaces. The green belt, which has continued its existence and effectiveness for the City of London since the 1930s, is an important open space use policy (Elson, 1986).



Figure 2. London Greenbelt Recreation Areas (URL-3)

The green belt covers the areas surrounding the city center in London, outside the residential areas. In this way, it protects the landscape. It prevents the uncontrolled spread of urbanization in areas outside London. In these areas, agricultural activities can be carried out, natural habitats are protected and biodiversity is maintained. It offers areas where city people can spend time in touch with nature. It also includes recreational areas such as cycle paths, walking tracks and picnic areas. It is an important urban

model in terms of environmental protection, sustainable development and increasing the quality of life. It protects both natural areas and recreational areas that people can access. In this way, it makes a great contribution to sustainability.

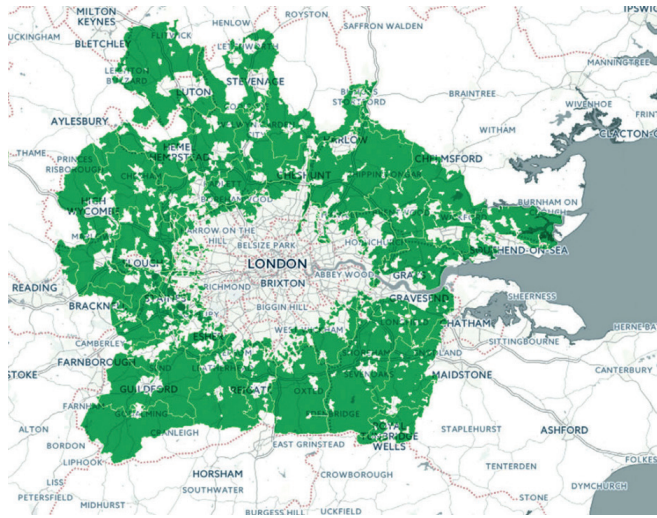


Figure 3. London Greenbelt Model (URL-3)

- **Raymond Unwin green belt model:** 1929 Open Space System Plan, the 1929 plan made by Raymond Unwin on "Open Spaces" explains the concept of green belt and open space standards. The important aspect of the plan is to meet the needs of an open space belt and recreation around London. It is also the suggestion of green wedges inserted into the city. Unwin's proposal is not an agricultural belt. It is a green belt model that will eliminate the lack of open spaces near the city of London and parks with playgrounds (Korgavuş & Ersoy, 2015). Raymond Unwin's green belt model advocates the development of cities in harmony with nature. This model aims to protect the natural areas surrounding the city, support agriculture, build aesthetic and sustainable city structures and increase the opportunities for people to live in harmony with nature. Unwin's contributions laid the foundations of environmental and human-oriented approaches in modern city planning. (Turner, 1991).

- **Abercrombie green belt model(Figure 2):** Developed by British urban planner Patrick Abercrombie. It aims to create natural green belts around urban areas and expresses an urban planning approach. This model aims to control the spread of cities and protect the natural environment. The main idea of Abercrombie's green belt model is to prevent the intertwining

of these areas by placing green belts of a certain width around cities. This model aims to protect both natural areas and ensure the healthy growth of cities. In the early 1940s, Abercrombie began to design the green belt he thought of for London. The purpose of the green belt he proposed was to prevent the expansion of London, to protect the agricultural reserve, and to suggest the development of areas where recreational activities would take place (Çulcuoğlu, 1991; Çelik, 2005; Uysal, 2014).

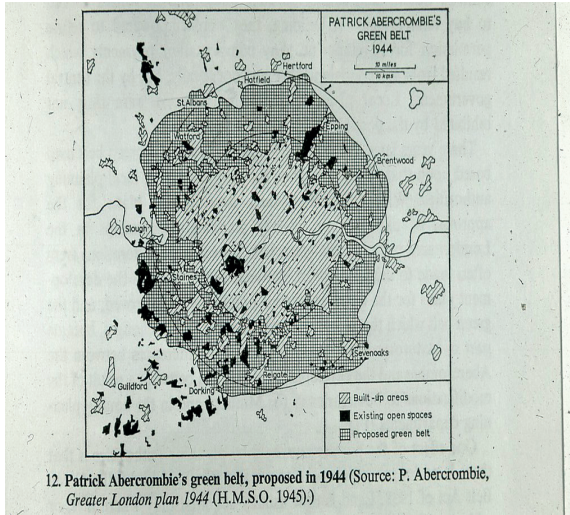


Figure 4. Abercrombie Green Belt Model (Abercrombie, 1944).

In urban areas, green belts refer to natural green areas around a city or residential area. They usually include elements such as natural landscape, recreational areas, agricultural lands and forests. These green areas ensure the sustainability of the urban environment, protect the ecological balance, and have important functions and functions to increase the quality of life. There are many different areas of use in the green belt. Therefore, integrity and integration are indispensable approaches. Green belt applications do not only limit urban development, protect rural areas around cities. But also have ecological, economic and social functions in the city.

The economic functions of green belts include; agricultural areas, animal husbandry areas, areas providing wood raw material production and commercial recreational areas. Green belts have many benefits for the city in terms of their ecological functions. In terms of biodiversity; urban green belts support ecosystem diversity as a habitat for different plant and animal species. These areas help preserve biodiversity in the city. Providing Habitat; These areas protect natural habitats within the city and provide passage

corridors for animals. In terms of Water Management and Surface Water; green belts reduce the risk of flooding by increasing rainwater absorption and help feed underground water resources. Carbon Storage; Vegetation absorbs carbon dioxide released into the atmosphere and stores carbon, thus reducing the carbon footprint of cities (Tzoulas et al., 2007; Forman, 2008; Bayramoğlu & Toksoy, 2010).

Green belts have a recreational effect in terms of social and recreation. Urban green belts encourage outdoor activities such as walking, running, and cycling. These areas support physical health and enable social interactions). In terms of psychology, natural green areas reduce the stress of city life and provide psychological recovery for individuals (Ulrich, 1984). Studies on the stress-reducing effects of urban green areas show that these areas are an important source of psychological health. In terms of social, green areas strengthen social ties between people and bring communities together (Kaplan, 2001).

Green belts create an urban agricultural environment. It contributes to food security for city dwellers by providing areas for organic farming and local food production. By providing Local Food Production, agricultural activities carried out in green areas within the city encourage fresh and healthy food production (Lohrberg et al., 2016). It creates a connectivity effect with greenways. Urban green belts can help people prefer sustainable transportation methods by creating bicycle paths, walking trails and green corridors (Handy, 2005). Green belts within the city contribute to various transportation networks as "green corridors" that divide the city with natural roads. They provide climate adaptation. Urban green areas create resistance to extreme weather conditions. Especially in hot climates, these areas prevent cities from warming and contribute to the fight against climate change (Gill et al., 2007).

1.2.Economic Benefits of Green Belts

Urban green belts protect the natural areas around cities and limit urban sprawl. They are open spaces created to provide environmental balance. Urban green belts provide cities with natural areas and ecosystem services. They are designed to limit the expansion of cities and provide environmental balance. These belts protect the city from environmental damage, support biodiversity and create ecological corridors. They contribute to the sustainability of wildlife. These green belts not only provide environmental benefits, but also offer a number of economic functions and benefits that positively affect the economy of cities. It is stated that urban green areas, especially with the growth of cities, function as recreational areas and natural protection zones. These belts also strengthen social ties by improving the quality of life of people (Heynen et al., 2006).

Increases Land Value: Urban green areas can increase the value of the surrounding land. Housing located near green areas can usually be sold at higher prices. This is because green areas offer aesthetic and environmental factors that increase the quality of life. For example, a study has shown that housing near city parks sells for higher prices (Wolf, 2003). Urban green belts increase the value of surrounding real estate. The value of residential and commercial areas increases in settlements close to green areas. Green belts directly contribute to the real estate market in these areas because they increase the quality of life. It is stated that real estate values near green areas can be 10% to 25% higher than in areas far from green areas. This presents an economic opportunity, especially due to the dense population growth and limited land use in urban areas.

Provides Energy Savings: Green belts reduce energy consumption by balancing temperatures in cities. Especially in the summer months, green areas cool the surrounding buildings. This reduces the energy requirement for cooling the buildings. Studies show that urban green areas reduce energy costs by reducing the heat island effect in cities. In urban areas, large concrete and asphalt surfaces can absorb sunlight and increase ambient temperatures. This creates the "urban heat island" effect in cities. Green belts reduce this effect with trees and plants, making cities cooler. Trees and other green areas reduce the temperatures around them through water evaporation and shading. This allows buildings to be cooled with less energy (Levinson et al., 2009). Green areas provide natural insulation to the buildings around them. Trees and other plants block the air flow around the buildings, reducing heat loss or heat gain. This makes the interior temperatures of the buildings more stable. Thus, the dependence on heating and cooling systems is reduced (Lee & Maheswaren, 2011). It reduces ambient temperatures through water evaporation. This reduces summer temperatures, especially in cities, reducing cooling needs in buildings. In addition, green areas absorb rainwater, preventing flooding and improving water management in urban infrastructure. Green areas absorb rainwater and infiltrate it underground, reducing ambient temperatures through water evaporation. This natural cooling mechanism reduces the use of artificial cooling systems. Urban green applications such as green roofs and vertical gardens improve the insulation of building exteriors.



Figure 5. Green Roof Garden (URL-4, URL-5)

Provides Tourism and Recreational Activities: Urban green areas constitute an important resource for tourism and recreational activities. Green belts can become centers of attraction for tourists coming to the city and stimulate the local economy. Xie and Batty (2004) stated that green areas contribute to the hotel, restaurant and transportation sectors by increasing the number of tourists coming to the city. This is an important economic factor that increases the number of tourists coming to the city. Green belts attract the attention of tourists. Especially since they contain elements such as natural landscapes, walking paths, ponds and parks. These areas become a center of attraction for tourists and increase tourism revenues. Urban green areas present natural and cultural heritage together. They can encourage sustainable tourism types such as ecotourism.

According to Rappaport (2007), parks and green areas in cities constitute centers of attraction for tourists. Urban green areas attract the attention of tourists who want to be in touch with nature. This increases the demand for accommodation, food and beverage and various tourist services. They provide space for recreational activities for city dwellers. Activities such as walking, running, cycling, picnicking and interacting with nature help people adopt a healthier lifestyle. They also contribute to the local economy. These activities generate income for cafes, restaurants and other commercial businesses in the area. Urban parks and green areas enrich the social life of local people and also contribute to the local economy. Green belts support commercial activities in the area by providing venues for social events and cultural activities.



Figure 6. Urban Parks and Green Areas (URL-6, URL-7)

In terms of Social Capital and Social Well-being: Green areas strengthen social ties and increase social capital. People engage in social activities in green areas. It increases social interaction and strengthens social harmony. This can lead to increased security levels and thus lower crime rates. This process increases the general well-being of the society and its economic benefits are seen in the long term. It is emphasized that green areas encourage social interaction. It strengthens social ties and creates more trust in the society (Liu et al., 2017).

In terms of Reducing Water Management and Infrastructure Costs: Green areas absorb rainwater, reducing flooding and pressure on water resources. This reduces infrastructure costs and improves water management in cities. The role of green areas in natural water management provides cities with long-term economic savings. Green areas help to naturally store and filter water, thus reducing the expenditures for cities' water management infrastructures (Schuch et al., 2010). It reduces surface water runoff, allows water to recirculate naturally and thus reduces water management costs of cities. It has been shown that it plays an important role in filtering water in urban areas and that these processes improve water quality. In addition, it can reduce water treatment costs. In addition, green belts help to increase the quality of water by capturing pollutants before they reach waterways.

In terms of reducing health expenditures: The physical and psychological benefits provided by green areas can directly affect health expenditures. Spending time in green areas regularly reduces people's stress levels. Improves physical health and prevents health problems in the long term.

It has been emphasized that urban green areas increase people's physical activity levels. It saves on health expenditures (Hunter et al., 2019). It can be said that such green areas make a great contribution to the economy by reducing health expenditures. It provides space for urban residents to do physical activities. Outdoor activities such as walking, running, and cycling encourage people to adopt a healthier lifestyle. Such activities help prevent obesity and other lifestyle diseases. Obesity can lead to serious health problems such as heart disease, diabetes, and high blood pressure, which increases health expenditures. It has been stated that the accessibility of green areas enables individuals to do more physical activity. It has been stated that this situation reduces health expenditures related to obesity. Increasing access to physical activity has also increased the demand for health services. Therefore, it can reduce health expenditures. Green areas make it easier for individuals to cope with stress, reducing treatment needs and related expenditures. The effect of green areas on improving air quality is quite high. It has been emphasized that this situation can reduce expenditures in the treatment of respiratory diseases. Green belts can relieve the pressure on health expenditures by reducing air pollution (Lee & Maheswaran, 2011; Nowak et al., 2014).

RESULTS

Urban green belts are important elements that enable cities to develop in a more sustainable, livable and healthy way. The protection and expansion of these areas are of critical importance for both nature and human health.

Urban green belts increase energy efficiency with various mechanisms such as natural cooling, water evaporation, shading and natural insulation. These green areas reduce the need for heating and cooling in cities, reduce energy consumption and thus energy costs. These mechanisms play an important role in the sustainability of cities, contribute to the goals of increasing urban energy efficiency.

The economic functions and benefits of green areas in cities provide important tools for achieving sustainable development goals. Therefore, the protection and development of green belts have a critical place in urban planning. Urban green belts reduce health expenditures by improving people's physical and mental health. These areas have a positive effect on health with factors such as more physical activity, cleaner air, reduced stress and social interaction. Therefore, the increase in urban green areas can significantly reduce the demand for health services and health expenditures.

REFERENCES

- Abercrombie, P. (1944). *Greater London Plan*. HM Stationery Office.
- Bayramoğlu, M. M., & Toksoy, D. (2010). Ormanlarda Karbon Birikimi ve Ekonomisi, *Orman Mühendisliği Dergisi*, vol.47, pp.16-20.
- Çelik, A. (2005). *Yeşil kuşak kavramı ve İstanbul kenti yeşil kuşak sistemi için öneriler* (Doctoral dissertation, Fen Bilimleri Enstitüsü).
- Çulcuoğlu, G. K. (1997). *Ankara Kent yeşil kuşak çalışmalarının yabancı ülke örnekleri açısından irdelenmesi ve yeşil kuşak Sistemi İçin öneriler* (Doctoral dissertation, Ankara Üniversitesi (Turkey)).
- Dirik, H., & Ata, C. (2005). Kent Ormancılığının Kapsamı, Yararları, Planlanması Ve Teknik Esasları. *Journal Of The Faculty Of Forestry Istanbul University*, 55(1), 1-14.
- Düzenli, T., Alpak, E. M., & Eren, T. E. (2018). Open Space in the Context of Spatial Organization. *International Journal of Eurasia Social Sciences*, 9(32), 1188-1201.
- Elson, M. (1986). *Green Belts*, William Heinemann Ltd., London,
- Forman, R. T. T. (2008). *Urban Regions: Ecology and Planning Beyond the City*. Cambridge University Press.
- Gill, S. E., Handley, J. F., Ennos, A. R., & Pauleit, S. (2007). Adapting cities for climate change: the role of the green infrastructure. *Built environment*, 33(1), 115-133.
- Handy, S. (2005). Smart growth and the transportation-land use connection: What does the research tell us? *International regional science review*, 28(2), 146-167.
- Handy, S. (2005). *Smart Growth and the Transportation–Land Use Connection*. Transportation Research Board.
- Heynen, N., Perkins, H. A., & Roy, P. (2006). The political ecology of uneven urban green space: The impact of political economy on race and ethnicity in producing environmental inequality in Milwaukee. *Urban Affairs Review*, 42(1), 3-25.
- Howard, E., (1965). “Garden Cities of Tomorrow”, Faber and Faber, London.
- Hunter, R. F., Cleland, C., Cleary, A., Droomers, M., Wheeler, B. W., Sinnott, D., ... & Braubach, M. (2019). Environmental, health, wellbeing, social and equity effects of urban green space interventions: A meta-narrative evidence synthesis. *Environment international*, 130, 104923.
- Kaplan, R. (2001). *The Nature of the View from Home: Psychological and Aesthetic Influences*. *Environment and Behavior*, 33(4), 507-534.
- Korgavuş, B. & Ersoy, M. (2015). Tasarımda sınırlayıcı unsur olarak yeşil kuşak-

lar. 9. Uluslararası Sinan Sempozyumu 21-22 Nisan 2015 Edirne / Türkiye

Lee, A. C., Maheswaran, R. (2011). The health benefits of urban green spaces: a review of the evidence. *Journal of public health*, 33(2), 212-222.

Levinson, R., Akbari, H., Pomerantz, M., & Gupta, S. (2009). Solar access of residential rooftops in four California cities. *Solar Energy*, 83(12), 2120-2135.

Liu, H., Li, F., Li, J., & Zhang, Y. (2017). The relationships between urban parks, residents' physical activity, and mental health benefits: A case study from Beijing, China. *Journal of environmental management*, 190, 223-230.

Lohrberg, F., Lička, L., Scazzosi, L., Timpe, A., & Verlag, J. (Eds.). (2016). Urban agriculture europe (Vol. 38). Berlin: Jovis.

Nowak, D. J., Hirabayashi, S., Bodine, A., & Greenfield, E. (2014). Tree and forest effects on air quality and human health in the United States. *Environmental pollution*, 193, 119-129.

Önder, S., & Kurtaslan, B. Ö. (2009). Kent Planlamaya Ekolojik Yaklaşımlar ve Konya Kenti Yeşil Kuşak Örneği. *Selcuk Journal of Agriculture and Food Sciences*, 23(47), 56-62.

Rappaport, J. (2007). *Outdoor Amenities and Residential Property Values: A Review of the Literature*. Journal of Real Estate Literature.

Schuch, G., Serrao-Neumann, S., Morgan, E., & Choy, D. L. (2017). Water in the city: Green open spaces, land use planning and flood management—An Australian case study. *Land use policy*, 63, 539-550.

Toksoy, D. & Bayramoğlu, M. M. (2020). Tarımsal Ormancılık (Agroforestry). Trabzon: Serander 2020, Pp.200.

Toksoy, D., Bayramoğlu, M., & Hacisalihoğlu, S. (2010). Usage and the economic potential of the medicinal plants in Eastern Black Sea Region of Turkey. *Journal of Environmental Biology*, 31(5), 623-628.

Turner, M. (1991). Reading Minds.

Tzoulas, K., Korpela, K., Venn, S., Yli-Pelkonen, V., Kaźmierczak, A., Niemela, J., & James, P. (2007). Promoting ecosystem and human health in urban areas using Green Infrastructure: A literature review. *Landscape and urban planning*, 81(3), 167-178.

Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science*, 224(4647), 420-421.

URL-1. <https://pin.it/60AQkgIPH>,

URL-2. <https://pin.it/25ZqjlluV>,

URL-3. <https://londongreenbeltcouncil.org.uk/information/>

URL-4. <https://tr.pinterest.com/pin/540432024043791958/>

URL-5. <https://tr.pinterest.com/pin/375769162671618045/>

URL-6. <https://tr.pinterest.com/pin/1266706140304018/>

URL-7. <https://tr.pinterest.com/pin/10133167901187442/>

Uysal, M. (2014). Yeşil dokunun yapma çevre ile bütünleşmesi. İstanbul Teknik Üniversitesi Fen Bilimleri Enstitüsü, Peyzaj Mimarlığı Anabilim Dalı

Wolf, K. L. (2003). Ergonomics of the city: Green infrastructure and social benefits. In *Engineering Green: Proceedings of the 11th National Urban Forest Conference*. Washington DC: American Forests (Vol. 115).

Xie, Y., & Batty, M. (2004). Integrated Urban Evolutionary Modeling*. In *GeoDynamics* (pp. 297-318). CRC Press.



CHAPTER 2

EVALUATION OF HOUSING ENVIRONMENTAL DESIGNS WITHIN THE SCOPE OF DISASTER-SENSITIVE OPEN GREEN SPACE PLANNING

Elif BAYRAMOĞLU¹, Nida KURAK²

1 Prof. Dr, Karadeniz Technical University, Faculty of Forestry, Department of Landscape Architecture, Trabzon / Turkey, elifsol_@hotmail.com, 0000-0002-6757-7766

2 Res.Asst., Karadeniz Technical University, Faculty of Forestry, Department of Landscape Architecture. ORCID: 0000-0001-9825-1913

Rapid urbanization has begun to create pressure in cities due to environmental, social and economic problems. Negative results increase the pressure on both the natural environment and services (Figueiredo et al., 2018). People encounter disasters almost everywhere on earth. The world is a dynamic planet. Therefore, changes occur in the world over a long period of time or all at once. Sometimes it is the result of natural processes, sometimes human intervention, and sometimes the interaction of the two. These results can make it difficult for the living beings it hosts to survive (Akdur, 2000). Turkey is one of the countries where natural or human-induced disasters occur most frequently and where loss of life and property is high. When the findings on this subject are evaluated; one of the most important reasons for the high disaster damage is the lack of planning in urban areas (Tercan, 2018).

Natural disasters are not preventable natural events. Establishing the relationship between disaster and planning is important in the context of minimizing the damage that may occur after the disaster. In this context, measures should be taken to reduce the risk of every disaster. The primary goal should be to produce planning and design decisions in this direction (Kırçın et al., 2017). Because disaster can be used not only for natural events but also for all kinds of events caused by humans and technology (Sarıçam, 2019).

Disasters cause material and moral damage to people and human-made works. They are natural, technological and anthropogenic events that affect societies by stopping or interrupting daily life and human activities (Meral et al., 2021; Özşahin, 2013). Disaster types are geological disasters, biological disasters, social disasters, technological disasters and climatic disasters (Çelik, 2023). However, disasters experienced especially in recent years are natural disasters. Floods, landslides, droughts, fires, hot or cold weather fluctuations and earthquakes are among the natural disasters. Natural disaster risks are increasing day by day due to climate change. Especially due to the increase in impermeable areas of many cities, they are exposed to higher risks and damages (Kim and Kim, 2017).

When evaluated in this context, it is important to use urban open green areas in disaster management to meet people's gathering, sheltering, transportation and storage needs. This approach has been provided especially recently by creating wide open spaces in urban open areas. It has gained importance in possible disaster management in cities both in short-term emergencies and in long-term periods. Such approaches also increase urban resilience.

Evaluation of urban open green areas as disaster areas

Urban open green areas are one of the important basic elements of

the urban fabric. They are defined as open spaces or empty areas outside of architectural structures and transportation areas. They are perceived as areas where there is no construction for any purpose on the outdoor area and there is a suitable potential for any recreational use (Özbilen, 1991; Düzenli and Alpak, 2017; Alpak and Düzenli, 2018). The concept of open space is one of the important basic elements of the urban fabric. They are defined as open spaces or empty areas outside of architectural structures and transportation areas. In other words, they are areas where there is no construction for any purpose on the outdoor area and there is a suitable potential for any recreational use (Önder, 2012).

Green areas have functions such as recreation, ecological, aesthetic, social, environmental protection, nature protection, reducing the greenhouse effect, energy saving, land organization, providing clean air, cooling the air, filtering the air, increasing the relative air humidity and absorbing noise (Ersoy, 2015). In addition, the purposes and goals of using open green areas are multifaceted. For example, creating attractive, sustainable, accessible and well-managed green areas, providing social, environmental, economic and health benefits, providing a high-quality and accessible green area network for people to enjoy, and making a positive contribution to the quality and diversity of the local environment, people's health and well-being (Çelik, 2023).

When urban open green areas are evaluated in disaster management, planning criteria should be taken into consideration. When planning urban open and green areas, attention should be paid to their optimum distance from residential areas, being easily accessible, monitored, continuous and sufficiently large. In addition to the functions they undertake in emergency situations, the recreation and sports needs of the city should be met at sufficient levels, and opportunities to benefit from microclimate features should be developed. They should also have functions such as ensuring the continuity of alternative walking and cycling tracks (Atalay, 2008). Open and green areas used for recreation before the earthquake were sufficient; however, they should be suitable in terms of security, meeting emergency needs and accessibility in the event of a possible earthquake.

Disaster management of urban open green areas

The concept of disaster management is the organization, planning and implementation of disaster preparation, prevention, intervention, disaster recovery and post-disaster recovery and development. Disasters occur in many ways. Man-made disasters are caused by human errors and include industrial explosions or structural failures. Natural disasters are caused by physical events. Regardless of their form, disasters affect people. For this purpose, disaster management aims to prevent disasters and reduce their

damage. The work to be done before, during and after the disaster should be planned and directed (Ergünay, 2009; Baklacı, 2023).

Open green areas take on different functions after a disaster than the functions they were used before the disaster (Atalay, 2008). They constitute one of the basic building blocks of cities. In addition to their ecological, social, recreational and land use planning functions, they are also important areas for the post-disaster period. They are rescue spaces with their use as gathering, air access, storage and distribution of rescue materials, temporary tents or housing areas for shelter. They are areas where urgent needs, especially security, are met. They are places where interventions can be made, urban services are shifted, in other words, life starts again (Kırçın et al., 2017).

Disaster Management completes the technical arrangements that need to be made before, during and after disasters in order to prevent disasters and reduce damages. It determines administrative and legal studies and puts them into practice. There are two basic approaches in disaster management. These are “traditional disaster management”, which only includes disaster response actions, and “modern disaster management” approaches, which cover all processes before, during and after the disaster.

The Traditional Disaster Management Model; When explained terminologically, it includes the measures to be taken before and after the disaster in order to reduce the loss caused by disaster events. It is expressed as a system that envisages integrated application.

Modern Disaster Management; It is an approach with the stages of “preparation, prevention, mitigation, urgent and rapid intervention, improvement and development”. It provides clarification and improvement of disaster management processes with a systematic and orderly approach. Today, it aims to be prepared for, reduce, prevent and intervene against all kinds of dangers and disasters (Baklacı, 2023).

1.1. Evaluation of the immediate surroundings of the residence as a disaster area

Residential areas are the areas that people can most easily reach in times of disaster within open green areas. Housing is designed for people to continue their existence due to not feeling safe outdoors. The housing environment meets the physical and psychological needs of having a safe environment, living in a healthy environment, protecting privacy (Ustaoglu, 2020). Housing has continuously developed throughout the historical process, up to new forms created with man-made materials. Due to the natural environment, technical and social differences, housing of different sizes, forms and types can be seen. The fact that people have different

needs and environmental conditions has revealed the need for new housing designs. First of all, meeting user expectations, being compatible with the environment and climate conditions, being suitable for design and being sensitive to nature are the expectations from housing designs (Düzünli et al., 2018; Çetin Murat, 2022).

In this context, this subject was covered in the single housing designs of 2nd year students in the Karadeniz Technical University (KTÜ) Landscape Architecture Department in their Environmental Design Project II courses. Within the scope of the project course, the use of open green space against natural disasters, which has been on the agenda recently in single housing environmental designs, was addressed as the immediate vicinity of the house. Within the scope of the project course, the concepts and scenarios of 4 students were evaluated. Within the scope of the course, the students determined outdoor use activities in line with the basic needs of the housing users. Then, each student created their scenarios by customizing their activities in line with their own concept and notion.

1. Disaster-sensitive student housing and immediate surrounding design

The student developed a concept in accordance with the concept of **IKIGAI** in his project. The user of the house lived in Japan for years and now migrated to Turkey and is a family prepared for earthquakes due to natural disasters. For this reason, he wanted to design gathering areas positioned in the garden of the house for a possible disaster. These gathering areas were designed to be away from the house but semi-enclosed and to meet the needs of the users of the house for a certain period of time. Since the country was unprepared for the disasters in recent years, it was aimed to be prepared before the disaster. A space was created that was used during the disaster in order to make predictions and reduce the damages and was designed as a children's playground before the disaster. This approach, which can also be considered as disaster management, has shown that open and green areas play very important roles in disasters.

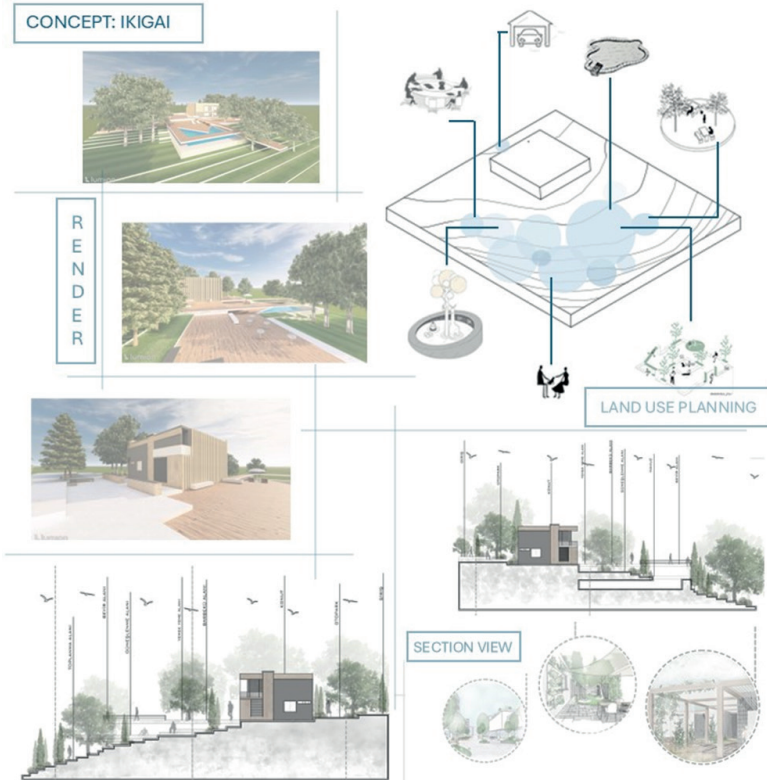


Figure 1. Concept of IKIGAI

2. Disaster-sensitive student housing and immediate surrounding design

The student has done a study with the concept of **AQUATIC LIFE** in his project. In his scenario, he first associated the activity areas around the house with water due to the city's high rainfall. He created sets on the land aiming to reduce the flow of water to prevent flood disasters. With these terrace sets, he took precautions against disasters and provided a variety of activities in terms of design. It was aimed to collect rainwater with water channels in the vicinity of the house. The accumulated water was used to fill the pool and water the garden plants. In addition, a sloped fruit and vegetable growing area was created to prevent the flow of water in possible rains. The owner of the house aims to raise awareness against natural disasters such as floods and erosion by receiving special education support.

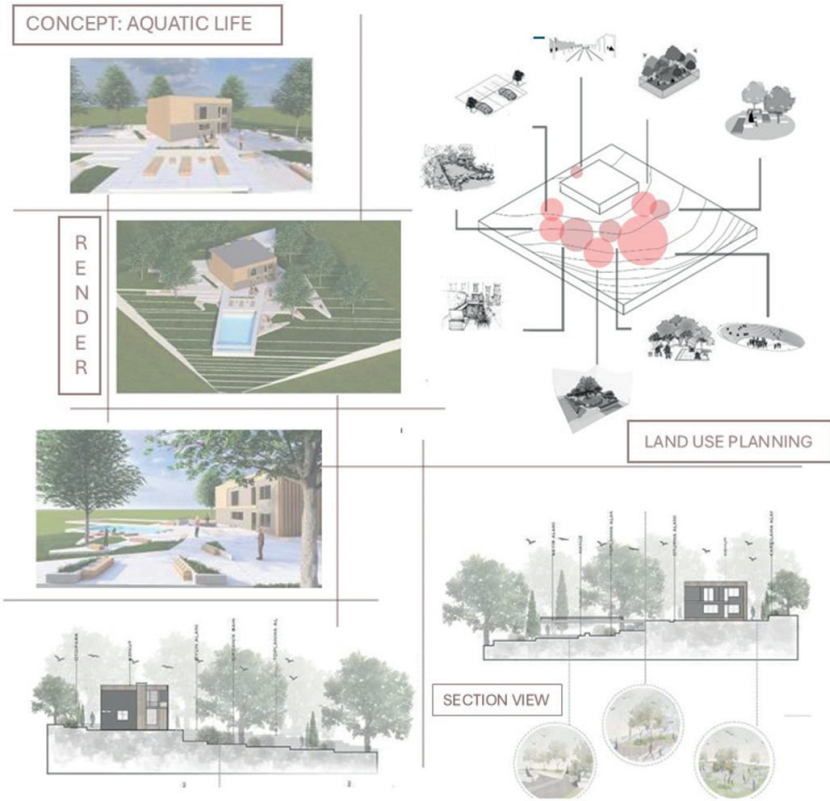


Figure 2. Concept of AQUATIC LIFE

3. Disaster-sensitive student housing and immediate surrounding design

In the student project, he suggested the use of open spaces in the vicinity of the house against natural disasters with the concept of salvation. Especially in times of earthquake risk, wooden shelters were created by moving away from the built housing environment and the family provided salvation places together. In this way, they will provide safe shelter environments in times of crisis. With the open seating steps created for the neighbors in the vicinity of the house, the opportunity to use the outdoor space in times of earthquakes was provided.

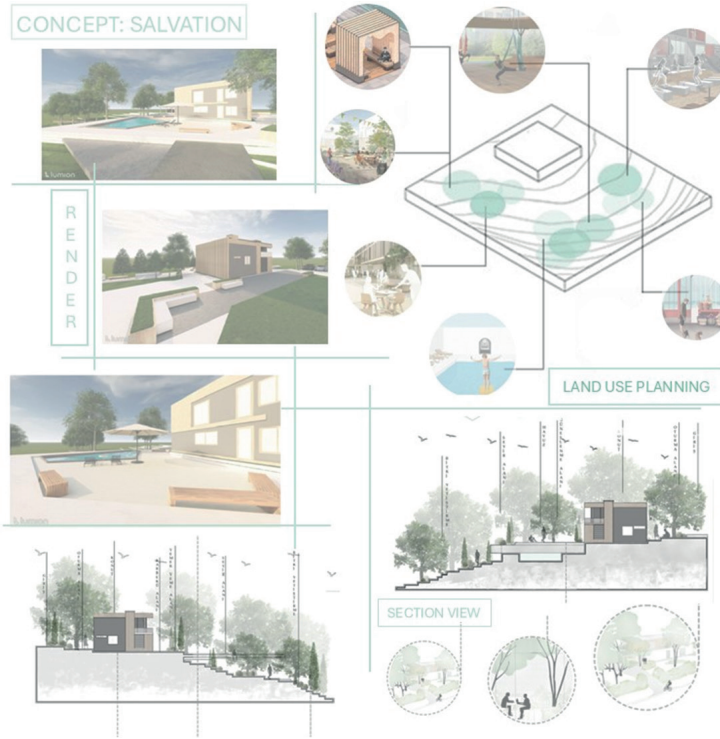


Figure 3. Concept of SALVATION

4. Disaster-sensitive student housing and immediate surrounding design

The student evaluated the concept of **POSEIDON** in his project. In his scenario, the user of the house is a firefighter, so he is very sensitive and knowledgeable about earthquakes, fires and floods. In order to convey the precautions to be taken during and after the disaster to his family and close circle, he created a practice area in the garden of the house. This area is semi-open and includes sensitive approaches especially to the precautions to be taken against earthquakes. For this purpose, seminars and educational activities are organized in this place at certain times of the year. Separate spaces are created for the young children of the family for the seminars. Both play elements and educational areas are created in these areas. The family, who emphasizes outdoor use, has a hobby garden for growing fruits and vegetables and raises pets to help in disasters. Pet shelters have been provided for this purpose. Since the wife of the house is a psychologist, spaces have been provided where she can do post-disaster therapy.

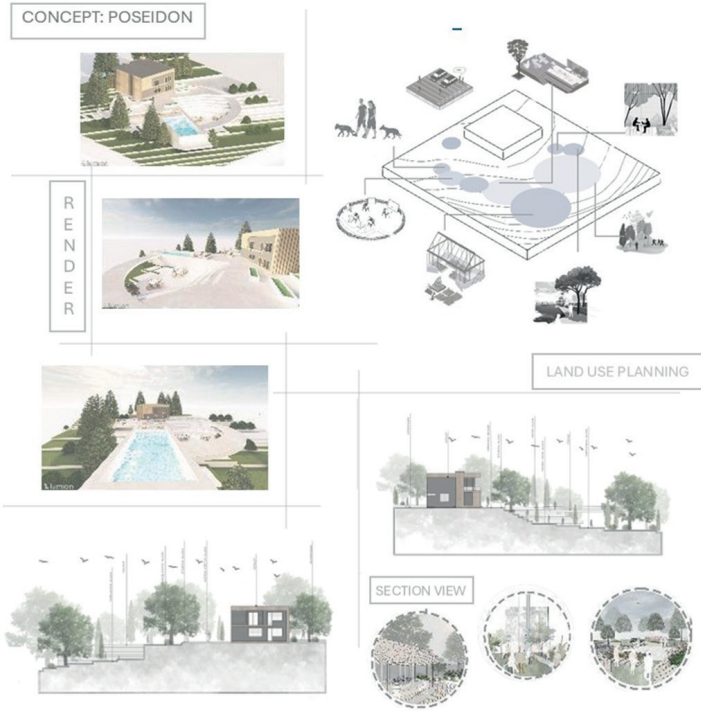


Figure 4. Concept of POSEIDON

RESULTS

The changes experienced in the world are sometimes the result of natural processes, sometimes human intervention, and sometimes the interaction of the two. These results can complicate or destroy the struggle for life of the living beings it hosts. This situation is called a disaster. It disrupts the normal life order of the society, causing loss of life and property. It is an ecological event that exceeds the capacity to respond and adapt, creating a need for assistance (Sarıçam, 2019).

Natural disaster risks are increasing more and more each passing day. Especially due to the increase in the impermeable areas of many cities, they are exposed to higher risks and damages. In Turkey, it is very important to minimize human and physical losses in disasters, to be prepared for disasters, to intervene correctly during disasters and to recover after disasters. However, disaster and emergency management has not been solved even today in our country and the public has not been made aware. The chaos that occurs after disasters and emergencies is tried to be resolved with national resources. However, this situation has not been a correct application because it is temporary solutions.

We know that it is not possible to prevent natural disasters. However, it is in our hands to take precautions at local scales. We can solve this situation by starting from our immediate surroundings as a precaution. Open green areas have positive effects in terms of preventing disasters and implementing precautions. The Spatial Plans Regulation published in 2014 addresses the planning of disasters. In the 2nd paragraph of Article 22, it is mentioned that topography, geological-geotechnical, hydrogeological structure features, land use, protected areas, infrastructure and natural and physical data can be evaluated together for analyses (Çelik, 2023).

Today, creating safer cities with planning studies carried out considering disaster risks should be one of the important criteria of urban planning. Open green areas, which provide ecological, economic and social benefits to the city, should be considered for functions such as gathering, sheltering, evacuation and provision of health services after a disaster. In addition to the many functions of open green areas, they also take on different functions after and before a disaster. Open-green areas are the first gathering areas where urgent needs, especially security, are met after a disaster. In other words, they are places where life begins again. Because people feel in danger during natural disasters, they instinctively want to use open spaces. The inadequacy of open-green areas negatively affects the quality of life in the city and is also disturbing in terms of natural disaster risks (Özcan et al., 2013; Kırçın et al., 2017; Sarıçam, 2019). Planned and need-oriented design-oriented urban open-green area arrangements of open green areas should be among the targets.

The immediate surroundings of a single house are the most intensively used areas by people as open green areas. They are the first areas used after a disaster. For this reason, residential immediate surroundings should be planned against disasters. It is very important for residential users to use it as a post-disaster gathering place and as an emergency response area for people in the area.

References

- Tercan, B. (2018). Türkiye’de afet politikaları ve kentsel dönüşüm. *Abant Kültürel Araştırmalar Dergisi*, 3(5), 63-74.
- Çetin Murat, L. (2022). Küresel İklim Değişiminde Doğal Afetler ve Konut Tasarımı İlişkileri. Aksaray Üniversitesi Fen Bilimleri Enstitüsü. Yüksek Lisans Tezi
- Akdur, R. (2000). Afetler ve Afetlerde Sağlık Hizmetleri, Türkiye Sorunlarına Çözüm Konferansı-3, 21. Yüzyılda Türkiye.
- Kırçın, P.N., Çabuk, S.N., Aksoy, K., Çabuk, A. (2017). Ülkemizde Yeşil Alanların Afet Sonrası Toplanma Alanı Olarak Kullanılma Olanaklarının Artırılması Üzerine Bir Araştırma, 4. Uluslararası deprem Mühendisliği ve Sismoloji Konferansı 11-13 Ekim 2017, Anadolu Üniversitesi, Eskişehir
- Özcan, N.S., Erdin, H.E., Zengin, H. (2013). Kentlerde Açık ve Yeşil Alan Sistemlerinin Afet Yönetimi Bağlamında Kullanılabilirliğinin Değerlendirilmesinde Coğrafi Bilgi Sistemleri (CBS): İzmir örneği, TMMOB Coğrafi Bilgi Sistemleri Kongresi 11-13 Kasım 2013, Ankara
- Atalay, H. (2008). Deprem Durumunda Kentsel Açık ve Yeşil Alanların Kullanımı – Küçükçekmece Cennet Mahallesi Örneği, Yüksek Lisans Tezi, İstanbul
- Önder, S. (2012). Kentsel Açık-Yeşil Alanların Kent Yaşamındaki Yeri ve Önemi, Kentsel Peyzaj Alanlarının Oluşumu ve Bakım Esasları Semineri, Konya
- Düzenli, T., Alpak, E. M., & Yılmaz, S. (2018). Kentsel Dönüşüme Alternatif Bir Yöntem: Yeşil Çatı Tasarımı. *International Journal Of Social Humanities Sciences Research*, 5(20), 745-752.
- Ustaoğlu, S. S., (2020). Güvenli Yapı Tasarımında Risk Odaklı Bütünleşik Model Önerisi, Yüksek Lisans Tezi, Yıldız Teknik Üniversitesi Fen Bilimleri Enstitüsü, İstanbul.
- Alpak, E. M., & Düzenli, T. (2018). Kentsel tasarımda esneklik ve adaptasyon: kentsel meydan senaryoları üretimi. *International Journal of Social and Humanities Sciences Research (JSHSR)*, 5(16), 16-22.
- Kırçın, P. N., Çabuk, S. N., Aksoy, K., & Çabuk, A. (2017). Ülkemizde Yeşil Alanların Afet Sonrası Toplanma Alanı Olarak Kullanılma Olanaklarının Artırılması Üzerine Bir Araştırma. 4. Uluslararası Deprem Mühendisliği ve Sismoloji Konferansı 11-13 Ekim 2017.
- Figueiredo, L., Honiden, T. & Schumann, A. (2018). Indicators for Resilient Cities. OECD Regional Development Working Papers, 66 p.
- Sarıçam, S. (2019). Kentsel Açık-Yeşil Alanların Afet Sonrası İşlevleri. *GSI Journals Serie B: Advancements in Business and Economics*, 2(1), 1-15.

- Özbilen, A., (1991). Kent içi Açık Alanlar ve Dağılımı, Tarihi Eserler ve Gelişen Yeni Yapılaşma, K.T.Ü. Orman Fakültesi, Genel Yayın No:155, F.Y.N: 17, Trabzon, 1991.
- Düzenli, T., & Alpak, E. M. (2017). Yaşlıların Kentsel Açık Mekân Kullanımlarının İncelenmesi: Trabzon Kenti Örneği. *Yaşlı Sorunları Araştırma Dergisi*, 10(2), 1-8.
- Kim, S. Y. & Kim, B. H. S. (2017). The Effect of Urban Green Infrastructure on Disaster Mitigation in Korea. *Sustainability*, 9(1026), 1-12.
- Çelik, K.D., (2023). Akıllı yönetim bağlamında kentsel açık ve yeşil alanların afet sonrası kullanım potansiyellerinin tespitine yönelik bir model önerisi: Amasya örneği. Karadeniz Teknik Üniversitesi / Fen Bilimleri Enstitüsü / Peyzaj Mimarlığı Ana Bilim Dalı, Trabzon.
- Baklacı, E. (2023). Afete Duyarlı Planlama Yaklaşımı ve Yer Bilimsel Verilerin Mekânsal Plana Entegrasyonu: Bursa İl Merkezi İncelemesi. Eskişehir Teknik Üniversitesi Lisansüstü Eğitim Enstitüsü.
- Ergünay, O. (2009). Afet Yönetimi: Genel İlkeler, Tanımlar, Kavramlar.
- Ustaoglu, S. S., (2020). Güvenli Yapı Tasarımında Risk Odaklı Bütünleşik Model Önerisi, Yüksek Lisans Tezi, Yıldız Teknik Üniversitesi Fen Bilimleri Enstitüsü, İstanbul.
- Kırçın, P.N., Çabuk, S.N., Aksoy, K., Çabuk, A. (2017). Ülkemizde Yeşil Alanların Afet Sonrası Toplanma Alanı Olarak Kullanılma Olanaklarının Artırılması Üzerine Bir Araştırma, 4. Uluslararası deprem Mühendisliği ve Sismoloji Konferansı 11-13 Ekim 2017, Anadolu Üniversitesi, Eskişehir.