

**Review Article** 

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# Çevresel Sürdürülebilirlik ve Türkiye'deki Üniversitelerin Greenmetric Sertifika Sistemindeki Başarısının İncelenmesi

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#### Anahtar Kelimeler

Yeşil Kampüs Sürdürülebilirlik Peyzaj Açık yeşil alan

Öz: Sürdürülebilirlik, doğal kaynakların korunmasında, zarar gören ekosistemin iyileştirilmesinde, enerjinin korunarak verimliliğin sağlanmasında, sosyal ve ekonomik refahın oluşumunda ve ayrıca sosyal katılımın sağlanmasında önemlidir. Sürdürülebilir ve yeşil kampüslerin oluşturulmasında ise üniversitelere yol gösterici olarak birçok kılavuzlar ve raporlar mevcuttur. Bu kılavuzlardan en yaygın kullanılanı 2010 yılında Endonezya University tarafından başlatılan UI GreenMetric'tir. Dünya Üniversite Sıralaması, yeşil kampüs ve çevresel sürdürülebilirlik konusuna dayalı olarak hazırlanan bir sıralama sistemidir. Dünya üniversitelerinin ortak sorunu olan iklim değişikliği ile mücadele etmekte birlik ve beraberlik gerektiği düşünülerek kurulmuş bir sistemdir. Bu çalışmada Türkiye'den Greenmetric sistemine puanlamaya giren üniversiteler incelenmiştir. UI GreenMetric sertifika sisteminde, sürdürülebilir bir kampüs için yapılacak planlama ve tasarımlarda, karbon ayak izi ve iklim değişikliğinin azaltılması, yağmur suyu yönetimi, atık suların geri kazanılması, katı atıkların geri dönüştürülmesi, kampüs açık-yeşil alanların nitelikleri ve miktarları gibi konuların önemli olduğu görülmüştür. Bu konuların dikkate alınması, kampüs peyzajının ekolojik sürecinin iyileştirilmesi ve geri kazanımında etkili olabilir.

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# Environmental Sustainability and Examining the Success of Turkish Universities in Greenmetric Certification System

#### Article Info

Received: 21.05.2024 Accepted: 26.06.2024 DOI: 10.59128/bojans.1487801 **Abstract:** Streets, boulevards, and medians have functioned as bridges that facilitate urban life and connect areas within the city, urban and rural areas. Greenbelts and other urban green areas that protect the city residents against wind, dust, noise, and air pollution, are reinforced with environmentalist approaches. The border of the city of Yozgat with the cities of Ankara, Kayseri, and Sivas and its proximity to each other make its communication continuous

Keywords

Green Campus Sustainability Landscape Open green space in terms of economic and social tourism. The fact that the city of Yozgat is a transit city in the transportation of cities to each other makes the city open to development in terms of economy and tourism. Here, the first way to have a positive effect on the people passing through the city is the planting works carried out on the intercity and city center roads. This study aimed to determine the importance of Lise Street in the urban road landscape and whether the applications were by the plant design principles. In the study, compliance with the urban road planting criteria was scored with the Lawshe technique, with the opinions of eight experts. As a result of the study, the position, aesthetic, and functional use of ornamental plants in the existing green system were determined. In addition, deficiencies were determined in the planting studies and suggestions were made.

#### 1. Introduction

Since the beginning of time, humans have focused on development, change, and consumption to meet the increasing needs of themselves and their environment. With rapid population growth, the inequality in the scales of development, change, and consumption has led to unconscious consumption. This imbalance, which did not seem threatening firstly, has become increasingly evident in recent years due to people's desire for a more comfortable life and the activities of individuals and nations due to their selfish desires. For example, environmental pollution, global warming and climate change, unconscious consumption of water resources, floods, droughts, epidemics, wars, urbanization, migration, and noise pollution have made the world more dangerous. These situations have led to reflection on what should be done to reduce and prevent problems that could affect human life and the continuity of the ecological life cycle (Gülgün et al., 2020; Gülgün and Yazici, 2021; Ankaya et al., 2019). Therefore, the concept of sustainability has gained importance worldwide. Sustainability means ensuring that activities to meet people's needs take into account the needs of future generations without jeopardizing them. This includes environmental, social, and economic dimensions and aims to ensure people use resources to meet their future needs. What is important in sustainability is not only to conserve and regenerate resources to meet current needs but also to conserve and regenerate resources to meet future needs. Sustainability studies strive to balance the environmental, economic, and social dimensions, while also trying to meet the needs of future generations. In this context, universities that work on sustainability try to teach environmental and social sustainability to their students and also try to implement sustainability on their campuses (Yazici and Arslantaş Sağlamer, 2019; Yazici and Temizel, 2020; Gülgün et al., 2014; Gülgün and Yazici, 2016). Sustainability is a type of system that has been created against the threats of diminishing and extinction of the resources used by all living things interacting with each other in the ecosystem in the world today and in the future. Sustainability plays an important role in protecting natural resources, improving the damaged ecosystem, ensuring efficiency by conserving energy, creating social and economic welfare, and ensuring social participation. With the roles it plays, the importance of the concept of sustainability has increased over time and has become a goal of many reports, conferences, agreements, institutions, and organizations targeting sustainability by real and legal persons. Examples include the Brundtland Report (1987), International Sustainability Report (1999), UN Climate Change Conference (2009), UN World Water Development Report (2020), COP26 United Nations Climate Change Conference (2021), ISO International Organization for Standardization, CASBEE Environmental Efficiency Assessment System and LEED Leadership in Energy and Environmental Design. Universities have important roles in sustainability as one of the easiest ways to address the world, where scientific studies that can provide conditions such as the development and implementation of the system, ensuring its continuity and protection, and meeting today's needs can be carried out. Using these advantages, universities have established organizations in countries with sustainable campus goals. Examples include the International Sustainable Campus Network (ISCN), the "Greening Universities Toolkit" prepared by the United Nations Environment Programme (UNEP), and the UI GreenMetric System founded by the University of Indonesia. Universities conduct many research and studies on sustainability. These researches are carried out on issues such as the development of scientific and technological solutions necessary for a sustainable world, the creation of programs that provide education on sustainability, and making campuses sustainable. Universities are involved in many projects targeting sustainability.

For example, they conduct studies and research on energy efficiency, waste management, green buildings, sustainable agriculture, and water management. Moreover, universities are involved in many international networks to share knowledge and experience on sustainability. These networks provide cooperation and information sharing among universities on sustainability.

The UI GreenMetric system, an internationally recognized sustainability-centered system, can be used for planning and design to achieve sustainable campuses. The UI GreenMetric assessment system includes topics such as wastewater management, energy conservation, climate change mitigation, carbon footprint reduction, quality and quantity of campus open-green spaces, and establishing and maintaining the ecological balance of the campus landscape.

Universities are important not only as institutions where education and training take place but also as organizations that are open to development and change and that guide the formation of society. Universities are the institutions that will take the first step as pioneers in environmentally friendly and sustainability issues while adapting to the development and change in the world and its environment. Considering what has happened in our country and the world in the last century, it has become essential to take steps toward sustainability for both present and future generations. In this case, universities are expected not only to respond to the environmental and functional events that are needed but also to produce solutions and projects. For example, with systems such as UI GreenMetric, an international organization that assesses sustainability, universities are trying to keep up with the changing world by conducting social, environmental, economic, and academic studies. With the development of science and technology, universities can produce environmentally friendly technologies and solutions. Furthermore, by researching social and environmental issues, universities meet the needs of society and the environment and leave a more sustainable world for future generations. In addition, universities include sustainability issues in their education programs and provide their students with knowledge and skills about these issues.

Within the scope of this study, the UI GreenMetric criteria, which is an international evaluation system that adopts sustainability methodologically, has been examined and the status of universities in taking protective measures against the changing world and especially the universities in Turkey, which have applied to the UI GreenMetric System and included in the list that definition of "green university" with sustainability goals, have been discussed.

### 2. Sustainability Concept

In the 18th and 19th centuries, the Industrial Revolution led to a level of prosperity that consumed non-renewable energy such as fossil fuels. This changing world order also led to developments in the field of medicine and found solutions to diseases. This led to an increase in population. As the needs of the growing population also increased, people accelerated the development process. However, while the damage caused to nature by the developing and changing world was initially on a local scale, in the last century, with the mobility between countries and continents where transportation is provided, it has started to be seen on a global scale by including polluting elements such as carbon footprint. As a result of globalization, climate change, environmental degradation such as wars, forest fires, floods, flood disasters, earthquakes, and environmental degradation and ecosystem degradation, human-induced destruction of irreversible resources, or the danger of depletion are seen. For this reason, as people have realized that natural resources are limited, they have turned to the concept of sustainability. This concept is an understanding that supports environmentally friendly development and development policies with the

aim of protecting nature for survival, maintaining and increasing the comfort of life, and the continuation of species.

In 1972, at the UN Conference on the Human Environment, the issue of 'environment' was brought to the agenda for the first time. After this conference, the concept of sustainability started to become popular. Sustainability was first defined in the Brundtland Report prepared by the World Commission on Environment and Development in 1987. The report defined sustainability as meeting the needs of the present without destroying or threatening to destroy the resources that future generations may need. According to the report, it is argued that all countries should act together socially, environmentally, economically, and politically to develop sustainability effectively.



Figure 1. Sustainable development goals ("United Nations Turkey", n.d.)

# 3. Sustainability in Campus Perspective

Society's unconscious consumption of natural resources without thinking about the future, using them as if they will never end, has led to an increase in air-water pollution, waste, carbon footprint and the severity of natural disasters. In order to minimize or completely eliminate these factors, the concept of sustainability has started to attract attention in all areas of life. Looking at the applicability of sustainability, it is seen that the most suitable areas are university campuses (Özdal Oktay and Özyılmaz Küçükyağcı, 2015; Özipek, 2018; Tosun, 2022). Universities have a very important role as centers of knowledge transfer and development in different fields and are considered as reference institutions for society. Universities represent the totality of structures where scientific research, education, and training are provided. While the existence of universities has positive impacts on social life, they are also institutions that bring negative consequences. They are places where many negative impacts such as carbon footprint, waste generation, environmental pollution, energy consumption, and natural resource consumption occur. To eliminate or minimize the negative impacts, it is necessary to create an environmentally, economically, and socially sustainable lifestyle in universities. The idea of a sustainable campus has been effective in the active implementation of the idea that it will be easier to implement sustainability in campus campuses since universities are smaller in scale compared to cities and are considered research, technology, and development centers. The planning, design, and implementation of sustainable campuses, taking into account the benefits for ecological, social and economic development and paying attention to aesthetic appearance and functionality, have played a role in defining sustainable campuses. A sustainable campus is a study carried out by universities to make their campuses socially, economically, and environmentally sustainable. This work is aimed at reducing energy and water consumption, improving waste management, taking environmentally friendly measures that protect biodiversity, and promoting social justice and economic stability. Sustainable campus projects can also include educational programs to enable students to better understand the areas encompassing sustainability while fulfilling the environmental and social responsibilities of universities. As an important part of sustainable campus projects, it is also important for universities to embed and implement environmental and sustainability policies.

### 4. UI Greenmetric and University Achievement Scale

Launched in 2010 by the University of Indonesia, the UI GreenMetric World University Rankings is a ranking system based on green campus and environmental sustainability. It is a system established with the idea that unity and solidarity are needed to combat climate change, which is a common problem in world universities. It is thought that by supporting and developing universities, which are accepted as the birthplace of new ideas and innovations, people today and in the future can adapt to the changing world. UI GreenMetric is an international ranking system that assesses universities' environmental sustainability strategies and practices. The UI GreenMetric system aims to encourage international universities to implement sustainable practices, provide relevant services, and promote international cooperation on sustainability. The system is designed to draw attention to the need for university leaders and interested parties to focus more on worldwide issues such as climate change, energy and water conservation, green transportation, and waste recycling. The assessment system is used to identify universities that will play a leading role in addressing these issues. Participation in the system increases attention to sustainability and related economic and social issues. As participation increases, services for sustainable universities are provided. These include consulting, detailed performance assessments, comprehensive audits and events to explore the latest trends in the sustainability ecosystem, and branding to increase the visibility of universities through the UI GreenMetric website and social media.

The system ranks universities based on various factors such as region, country, category, campus environment, location type, campus population, campus area, and age of the university. The UI GreenMetric system evaluates the environmental sustainability efforts of universities and helps to identify leading universities. Participation in the system aims to draw more attention to sustainability. In 2010, the year the UI GreenMetric system was established, only Bilkent University from our country took part in the participation of 95 universities in the world. It ranked 83rd with 3976 points. In 2011, with the participation of 178 universities, Sabanci University ranked 105th and Bilkent University ranked 165th. In 2012, Sabanci University ranked 144th and Bilkent University ranked 209th among 215 university participants.

In 2013, among 301 university participants, Izmir University of Economics ranked 254th for the first time, Sabanci University ranked 260th, Bilkent University ranked 290th and finally Malatya İnönü University ranked 293rd. In 2014, among 361 participants, Zonguldak Bülent Ecevit University ranked 237th, Karabük University ranked 255th, Izmir University of Economics ranked 276th, Sabanci University ranked 278th, Ankara University ranked 314th, Bilkent University ranked 342nd, Malatya İnönü University ranked 345th, Selçuk University ranked 350th and Manisa Celal Bayar University ranked 360th.

In 2015, 11 universities from our country entered the ranking among 407 universities. Zonguldak Bülent Ecevit University ranked 217th, Özyeğin University 260th, Sabancı University 276th, Karabük University 283rd, Selçuk University 303rd, Malatya İnönü University 320th, Kilis 7 Aralık University 341st, Ankara University 345th, İzmir Ekonomi University 359th, Bilkent University 378th and Manisa Celal Bayar 404th. In 2016, among 516 universities, the number of participants from our country increased and 17 universities applied. Boğaziçi University, TOBB Economics and Technology University, Hitit University, Bartın University, Ege University and Düzce University became the new participating universities.

In 2017, 619 participating universities from around the world and 23 universities from Turkey participated in the UI GreenMetric. Among the participating universities from Turkey, Istanbul Technical University ranked 1st in Turkey and 77th in the world with 5860 points, Bülent Ecevit University ranked 2nd in Turkey and 190th in the world with 5061 points, and Ankara University ranked 3rd in Turkey and 194th in the world with 5035 points.

In 2018, 719 universities from around the world and 30 universities from Turkey participated in the evaluation. Istanbul Technical University ranked 1st in Turkey and 67th in the world with 7125 points, Middle East Technical University (METU) ranked 2nd in Turkey and 151st in the world with 5975 points, and Zonguldak Bülent Ecevit University ranked 3rd in Turkey and 193rd in the world with 5600 points.

In 2019, 780 universities from around the world participated in the evaluation. Wageningen University in the Netherlands ranked first with 9075 points and Oxford University in the UK with 9000 points. Istanbul Technical University, which ranked 1st in our country with 7600 points, ranked 54th in the world. Erciyes University with 6550 points, which ranked 2nd in our country and 136th in the world, and Middle East Technical University (METU), which ranked 3rd in our country and 167th in the world with 6300 points.

According to the evaluation conducted in 2020, the Netherlands-Wageningen University ranked first with 9150 points out of 912 university participants. With 8875 points, England - Oxford University continued in second place. Although Istanbul Technical University from our country fell to 71st place in the world ranking, it maintained its first place in Turkey with 7800 points. Middle East Technical University (METU), ranked 2nd in Turkey and 103rd in the world with 7300 points, Erciyes University and Özyeğin University, with equal scores of 7175, ranked 3rd in Turkey and 142nd and 143rd in the world.

In 2021, 71 universities from our country participated among 956 universities. Wageningen University ranked first with 9300 points and Nottingham University ranked second with 8850 points. In our country, Istanbul Technical University ranked 57th in the world with 8150 points and maintained its first place in our country. Özyeğin University ranked 91st in the world with 7850 points and ranked 2nd in our country, and Erciyes University ranked 3rd in our country by ranking 99th in the world with 7775 points. In 2022, a total of 81 universities from different cities of our country participated among the 1050 participating universities. Wageningen University ranked first with 9300 points and Nottingham Trent University ranked second with 9175 points. Istanbul Technical University from Turkey ranked 47th in the world with 8585 points and continued to maintain its position by ranking first in our country. With 8260 points, Erciyes University ranked 86th in the world and second in our country.

In 2023, there are a total of 1183 participating universities from around the world, indicating that the system is useful and preferable. Table 1 shows some of the universities ranked in the evaluation ranking in 2023 and the total scores they received as a result of the category evaluation.

No	Sequencenumber	University	Point
1	46	İstanbul Teknik University	8635
2	63	Yıldız Teknik University	8575
3	69	Kıbrıs Uluslararası University	8575
4	85	Erciyes University	8460
5	89	Özyeğin University	8425
6	96	Ege University	8400
7	98	Yeditepe University	8375
8	123	Orta Doğu Teknik University	8225
9	152	Başkent University	8100
10	153	İzmir Yüksek Teknoloji Enstitüsü	8100
11	156	Malatya İnönü University	8075

Table 1. 2023 UI GreenMetric ranking of universities from Turkey and their category total scores (UI

GreenMetric, 2023).

		category total scores (UI GreenMetric, 2023).	
12	159	Dokuz Eylül University	8075
13	187	Bartın University	7910
14	189	Sakarya University	7900
15	208	Aksaray University	7760
16	231	Tokat Gaziosmanpaşa University	7625
17	247	Afyon Kocatepe University	7545
18	248	Hitit University	7540
19	255	Trakya University	7520
20	257	Kütahya Sağlık Bilimleri University	7510
21	258	Atatürk University	7510
22	262	Hasan Kalyoncu University	7475
23	278	Bilecik Şeyh Edebali University	7400
24	280	Muğla Sıtkı Koçman University	7385
25	287	Kastamonu University	7345
26	291	Firat University	7325
27	311	İstanbul Sabahattin Zaim University	7235
28	312	Hacettepe University	7235
29	314	Düzce University	7210
30	317	Sabancı University	7200
31	319	Mersin University	7195
32	357	Niğde Ömer Halisdemir University	7025
33	364	Ondokuz Mayıs University	6985
34	375	Çukurova University	6930
35	388	Kapadokya University	6870
36	391	Mardin Artuklu University	6860
37	403	Antalya Bilim University	6810
38	438	Bursa Teknik University	6610
39	446	Van Yüzüncü Yıl University	6585
40	458	İstanbul Aydın University	6525
41	460	Kocaeli University	6525
42	463	Gaziantep University	6515
43	473	Osmaniye Korkut Ata University	6485
44	479	Bursa Uludağ University	6475
45	483	Gazi University	6435
46	491	Selçuk University	6400
47	509	lğdır University	6350
48	514	Süleyman Demirel University	6335
49	532	Atılım University	6285

Table 1 (continued) Universities participating from T	urkey in the UI GreenMetric evaluation ranking for 2023 and their
category total s	cores (III GreenMetric 2023)

		category total scores (UI Greenwetric, 2023).	
50	549	Bilkent University	6225
51	557	Kto Karatay University	6200
52	572	Karamanoğlu Mehmetbey University	6125
53	574	Artvin Çoruh University	6110
54	575	Zonguldak Bülent Ecevit University	6110
55	594	İzmir Bakırçay University	6020
56	606	Bayburt University	5990
57	632	Eskişehir Teknik University	5875
58	674	İstanbul Gelişim University	5635
59	676	Uşak University	5625
60	678	Bolu Abant İzzet Baysal University	5605
61	682	Akdeniz University	5585
62	692	İstanbul Medeniyet University	5525
63	717	Ağrı İbrahim Çeçen University	5410
64	731	Bezmialem Vakıf University	5335
65	743	İstanbul Atlas University	5260
66	746	Sivas Cumhuriyet University	5260
67	747	Çağ University	5255
68	768	Manisa Celal Bayar University	5120
69	771	Kadir Has University	5080
70	806	TOBB Ekonomi ve Teknoloji University	4905
71	819	İstanbul Kültür University	4840
72	825	Marmara University	4810
73	829	Ankara University	4785
74	850	Tekirdağ Namık Kemal University	4665
75	852	Gebze Teknik University	4650
76	863	Adıyaman University	4580
77	868	Karadeniz Teknik University	4555
78	872	Karabük University	4545
79	880	Bahçeşehir University	4475
80	885	Anadolu University	4430
81	886	OSTİM Teknik University	4425
82	888	Kırıkkale University	4390
83	902	Batman University	4275
84	904	Erzurum Teknik University	4260

Table 1 (continued) Universities participating from Turkey in the UI GreenMetric evaluation ranking for 2023 and thei	r
category total scores (III GreenMetric 2023)	

	La		
85	933	Gaziantep İslam Bilim ve Teknoloji	4065
		University	
86	940	Kayseri University	4015
87	948	Kıbrıs Bilim University	3980
88	962	Ted University	3885
89	1000	Çankaya University	3575
90	1025	Işık University	3355
91	1035	Dicle University	3300
92	1063	Haliç University	3060
93	1081	Galatasaray University	2925
94	1106	Çankırı Karatekin University	2705
95	1132	Doğuş University	2285
96	1152	İstanbul Gedik University	2030
97	1154	Konya Teknik University	1965
98	1163	Tarsus University	1740

 Table 1 (continued) Universities participating from Turkey in the UI GreenMetric evaluation ranking for 2023 and their category total scores (UI GreenMetric, 2023).

## 5. Conclusion and Discussion

In conclusion, GreenMetric is an index to measure and compare the sustainability performance of universities. GreenMetric is recognized as an important tool for campuses to assess, improve, and promote sustainability performance on a global level. This can bring both environmental and societal benefits. The positive impacts on campuses are as follows:

Sustainability Awareness: GreenMetric provides a guide to understanding and reducing the environmental impact of campuses. This can raise awareness of sustainability issues among students, staff, and visitors.

Opportunity for Comparison and Improvement: The Index provides a tool to compare the sustainability performance of different universities. This can help each university identify its strengths and weaknesses and focus improvement efforts.

International Recognition: As GreenMetric is a benchmark used by many universities around the world, ranking highly on this index can provide prestige for universities internationally.

Reducing Environmental Impact: The index can help campuses set concrete goals to reduce their environmental impact and develop strategies to achieve these aims. This can lead to more efficient use of natural resources and reduced waste.

Student and Staff Engagement: GreenMetric can encourage student and staff engagement in sustainability efforts. This can help the campus community develop a broader culture of sustainability.

### References

Ankaya, F., Gülgün, B. and Yazici, K. (2019). Planing The Bicycle Roads in The Cities Examples In The World and in Turkey. Presented at *the International Symposium for Environmental Science and Engineering Research* 2019, KONYA.

Birleşmiş Milletler Türkiye. (t.y.). Türkiye sürdürülebilir kalkınma amaçları çalışmalarımız. https://turkiye.un.org/tr/sdgs

- Gülgün, B., Yazici, K., and Öztürk, İ. (2020). The Link Between Urban Ecosystem And Trees In Road side Planting. Presented at *The International Symposium for Environmental Science and Engineering Research* (ISESER), Manisa.
- Gülgün Aslan, B. ve Yazici, K. (2016). Yeşil Altyapı Sistemlerinde Mevcut Uygulamalar. Ziraat Mühendisliği Dergisi, Sayı 363.
- Gülgün, B. Güney, M.A., Aktaş, E., and Yazici, K. (2014). Role of the Landscape Architecture in Interdisciplinary Planning of Sustainable Cities. *Journal of Environmental Protection and Ecology*, 15(4), 1877-1880.
- Gülgün, B. ve Yazici, K. (2021). Ulaşım peyzajının işlevsel kullanımının değerlendirilmesi Gebze İzmir otoyolu. *Ege University Ziraat Fakültesi Dergisi*, 58(1), 115–124.
- UI GreenMetric, (2023). Erişim Tarihi: Aralık 6, 2023 <u>https://greenmetric.ui.ac.id/rankings/overall-rankings-2023</u>
- Özdal Oktay, S. ve Özyılmaz Küçükyağcı, P. (2015). Üniversite kampüslerinde sürdürülebilir tasarım sürecinin irdelenmesi. II. Uluslararası Sürdürülebilir Yapılar Sempozyumu Türkiye
- Özdoğan, B. ve Civelekoğlu, G. (2019). Üniversite yerleşkeleri için ulusal çevresel sürdürülebilirlik endeksinin geliştirilmesi. *Mühendislik Bilimleri ve Tasarım Dergisi*, 7(1), 65-80.
- Özipek, B. (2018). Kampüs tasarımında sürdürülebilirlik ilkeleri ve Burdur Mehmet Akif Ersoy Üniversitesi Yerleşkesi Örneği. [Yüksek Lisans Tezi. Mehmet Akif Ersoy Üniversitesi. Fen Bilimleri Enstitüsü] Yöktez.
- Tosun, M. (2022). Üniversite yerleşkeleri için çevresel sürdürülebilirlik dizinlerinin (green metrics) değerlendirilmesi. [Atatürk Üniversitesi Örneği. Yüksek Lisans Tezi, Atatürk Üniversitesi Fen Bilimleri Enstitüsü] Yöktez.
- Yazici, K., (2017). Kentiçi Yol Bitkilendirmelerinin Fonksiyonel- Estetik Açıdan değerlendirilmesi Ve Mevcut Bitkisel Tasarımların İncelenmesi: Tokat Örneği. *Ziraat Mühendisliği*. 364, 30-39.
- Yazici, K. ve Arslantaş Sağlamer, A. (2019). Tokat Kenti -Yeşilırmak Yakın Çevresinde Bulunan Rekreasyonel Alanlarda Kullanıcı Memnuniyetinin Belirlenmesi. *Türk Tarım ve Doğa Bilimleri Dergisi*, 6(4), 766-776.
- Yazici K. and Temizel S. (2020). Use of Lighting Equipment in Terms of Urban Landscape Designs; Example of Yozgat Sports Valley. *ISPEC Journal of Agricultural Sciences*, 4(4), 952–971.