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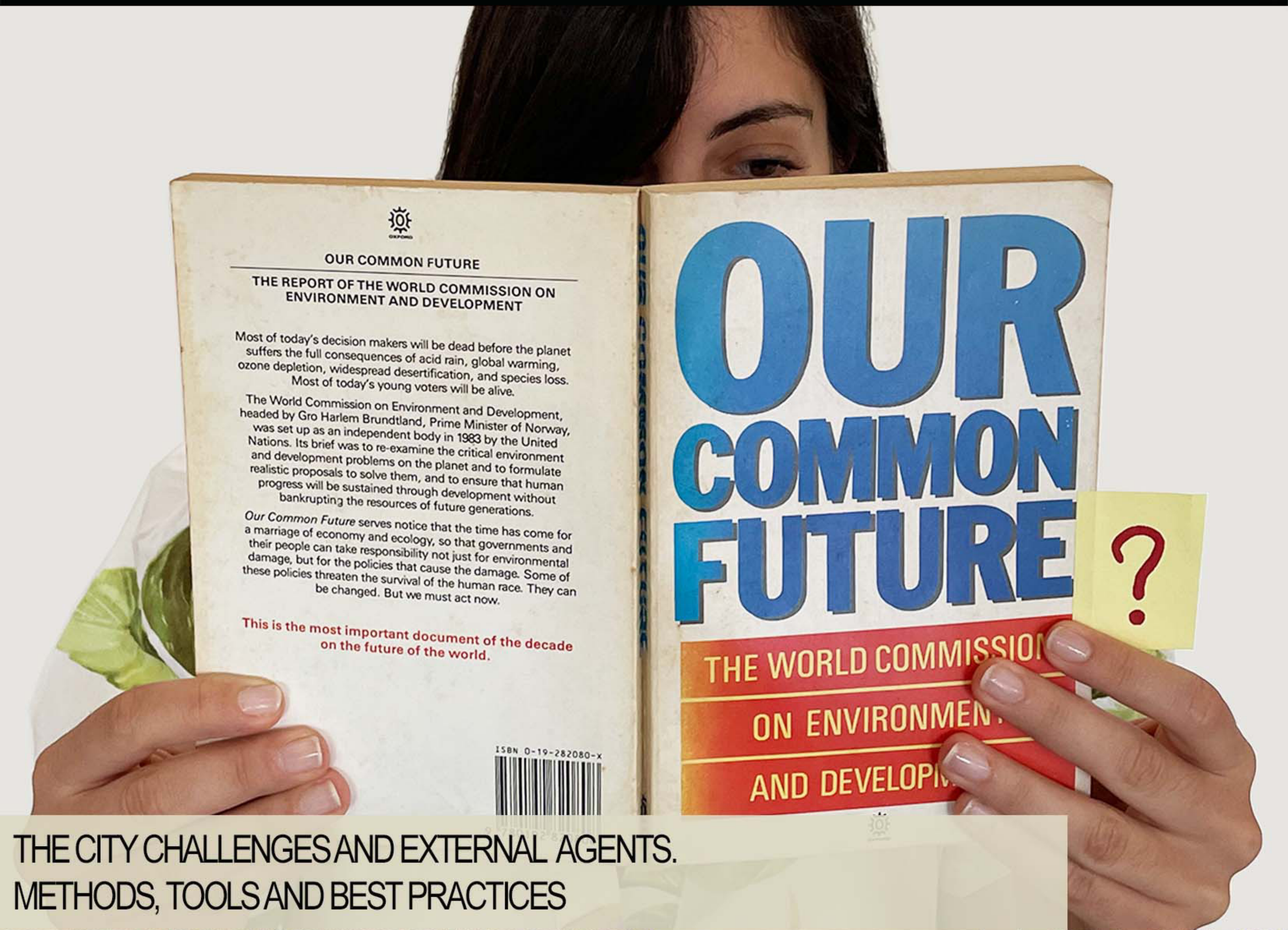

THE CITY CHALLENGES AND EXTERNAL AGENTS. METHODS, TOOLS AND BEST PRACTICES




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Laboratory of Land Use Mobility and Environment
DICEA - Department of Civil, Architectural and Environmental Engineering
University of Naples "Federico II"
Piazzale Tecchio, 80
80125 Naples
web: www.tema.unina.it
e-mail: redazione.tema@unina.it

The cover image shows a copy of the 1987 UN report "Our Common Future – The report of the world Commission on Environment and Developments". The picture has been taken in TeMA Lab in July 2023. On the bottom, there is a collage made up of four pictures of recent climate disasters (Source: Google images)

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Evaluation of sustainability of university campuses

The evaluation of Bursa Uludag University Görükle Campus according to UI GreenMetric World University Ranking

Gamze Altun [a]*, Murat Zencirkıran [b]

[a] Department of Landscape Architecture, Bursa Uludag University, Bursa, Turkey
e-mail: gamzealtun@uludag.edu.tr
ORCID: https://orcid.org/0000-0002-0686-6193
* Corresponding author

[b] Department of Landscape Architecture, Bursa Uludag University, Bursa, Turkey
e-mail: mzencirkiran@uludag.edu.tr
ORCID: https://orcid.org/0000-0003-0051-8937

Abstract
In this study, a total of six categories belonging to the International GreenMetric (UI GreenMetric) index by applying observational and physical analyses to Bursa Uludag University (BUU) Görükle Campus; structure and infrastructure (15%), energy and climate change (21%), waste (18%), water (10%), transportation (18%) and education (18%) and 51 evaluation criteria that define these categories. As a result of the evaluation, the university's estimated UI GreenMetric score for 2021 was calculated. As a result of the calculations, the estimated total success of BUU Görükle Campus was determined as 5,775. The highest success rate was obtained from the Education and Research (ED) (97.22%) category, while the lowest success rate was obtained from the Energy and Climate Change (EC) (39.29%) category.

Keywords
Sustainability; Green Campus; UI GreenMetric University Ranking.

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1. Introduction

One of the main concerns of generations living in the 21st century is called sustainable development. The pursuit of sustainable development has become a priority for both public and private organizations that aim to promote social, environmental and economic development without compromising the well-being of future generations. Reducing social inequalities and improving conditions, mitigating and adapting to climate change, and protecting cultural and natural heritage are some of the critical challenges organizations must focus on when creating wealth for communities that can thrive over time (Franco, 2022). Today, governments, research centers and local communities play a key role in promoting sustainability, which leads to increased commitment and work to identify the most impactful and harmful factors on the environment while disseminating education for sustainable development. The use of sustainability indicators has become a common methodology as a tool for reporting on the state of the economy or the state of the environment, clarifying goals and setting priorities, evaluating policy performance and monitoring progress towards sustainable development (Spadora et al., 2022). For this, attitudes and policies in social, economic and environmental fields need to be implemented not only in people's daily lives but also by institutions (Faga Iglecias Lemos et al., 2018).

Universities have been conceptualized as 'small cities' in their pursuit of sustainability due to their size and the impact of campus activities on the environment and society (Alshuwaikhat & Abubakar, 2008; Lauder et al., 2015). Planning and designing a new campus that responds to needs such as accommodation, work, rest and transportation is almost no different from planning and designing a city (Düzenli et al., 2017). For this reason, a university campus, besides being a natural part of the city ecosystem that plays a role in environmental sustainability, has the responsibility of directing the society to a sustainable future for a sustainable world (Abdurrahman, 2003; Hakim & Endangsih, 2021; Altun & Zencirkıran, 2021).

The importance of the role of universities in the development of sustainable development, which plays a key role in the development of society and the ecosystem, has been widely accepted. For this reason, ensuring campus sustainability has become a global concern for universities (Ak, 2022). The world's leading universities are taking steps to combat climate change by reducing their carbon footprints and thus managing their sustainability. Today, universities all over the world want to set an example with their environmentalist approaches and sustainable activities as well as their academic achievements. At this point, many systems have emerged that evaluate universities through sustainability approaches (Altun & Zencirkıran, 2021). The most widely accepted among these is the UI GreenMetric World University Ranking System, created by the University of Indonesia in 2010 and considered the first step towards a global ranking of the sustainable behaviour of universities (Grindsted, 2011). As a result of ranking the system campuses according to their sustainable approaches, online survey results are provided about the current conditions and policies regarding the green campus. The purpose of the system; is by drawing the attention of university leaders and stakeholders to combating global climate change, saving energy and water, recycling and green transportation, it is ensured that more importance is given to these issues in universities. As a result, it is expected that the importance given to behavioral change and environmental sustainability in universities will increase, along with solutions to economic and social problems related to sustainability. Identifying leading universities in this regard will guide other universities (Anonymous, 2022a).

In line with the sustainability goals, it is important to fully understand the current situation of the campus and to make the feasibility to plan the next step. To promote sustainable campus development, issues arising during development should be analyzed and possible approaches and action plans explored accordingly (Tan et al., 2014). This study, it is aimed to shed light on the progress of green campus development to understand the current situation of all initiatives to run a campus that covers sustainability in all its aspects and the upgrade of the campus to a green campus. In this direction, BUU Görükle Campus was evaluated according to the GreenMetric and the findings were interpreted with a critical perspective.

2. Material and Method

2.1 Research area

The main material of the study consists of BUU Görükle Campus and UI GreenMetric World Universities Ranking Guide and UI GreenMetric Measurement System criteria and indicators in the guide.

BUU Görükle Campus is located in the Marmara Region of Turkey, in the west of Bursa province. Located in an urban area, the campus lies between 40°13'26" latitude and 28°52'14" longitude and is 18 km from the city centre (Fig.1). The area of the campus is 14.26 km². In the 2021-2022 academic year, the total population of BUU Görükle Campus is 55065 (51,196 students, 2,074 academic and 1,795 administrative staff) (Altun, 2022).

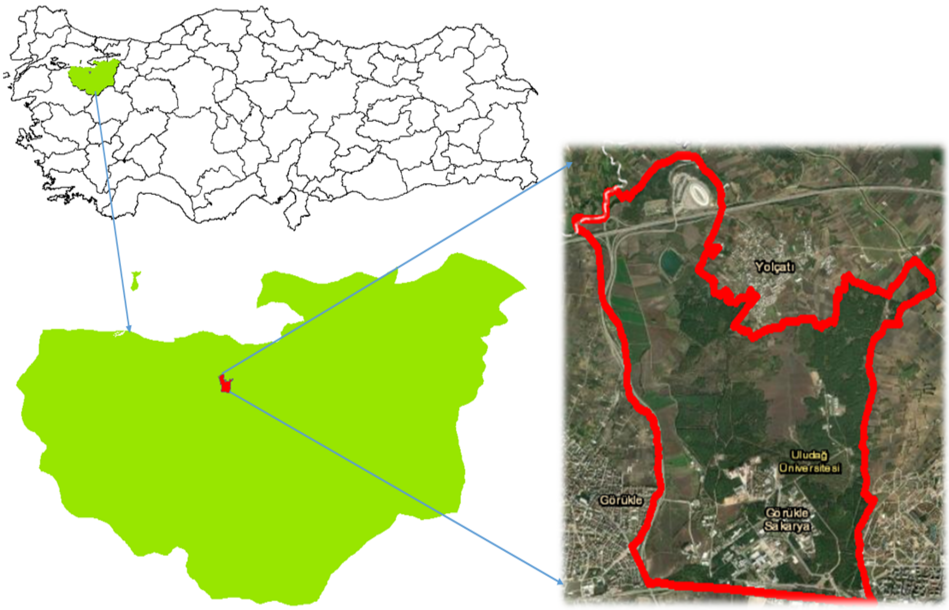

Fig.1 Location of the research area

2.2 UI GreenMetric World Universities Ranking

In the UI GreenMetric index, which offers universities from all over the world an online survey where they can evaluate their current situation and policies regarding sustainability and compare the results with other universities, 6 categories in total are Structure and Infrastructure (15%), Energy and Climate Change (21%), Waste (18%), Water (10%), Transport (18%) and Education (18%) (Tab.1), and 51 assessment criteria define these categories (see Supplementary Tab.) (Anonymous, 2022b).

	Category	Number of evaluation criteria	Maximum points (nr)	Maximum points (%)
1	Setting and infrastructure (SI)	11	1,500	15
2	Energy and climate change (EC)	10	2,100	21
3	Waste (WS)	6	1,800	18
4	Water (WR)	5	1,000	10
5	Transportation (TR)	8	1,800	18
6	Education and research (ED)	11	1,800	18
	Total			100

Tab.1 Categories and their weights used in the GreenMetric ranking

2.3 Method

This study covers the evaluation of BUU Görükle Campus by taking as reference the UI GreenMetric 2021 guide and the criteria/indicators in the guide (Tab.1).

Stages of work:

- providing information and documents from BUU management;
- collecting literary, visual, geographical, environmental and digital data related to the study area;
- field studies and measurements of BUU Görükle Campus;
- analyzing the data obtained in the ArcGIS program and obtaining estimated results based on the analyzes made (in case the requested data cannot be obtained or is not available on the campus, it is evaluated by writing 0 in the score section);
- developing proposals within the scope of sustainable/green campus planning.

3. Results

According to the calculations, the total score obtained by Bursa Uludag University Görükle Campus from the IU GreenMetric Word University ranking is 5775. The distribution of the total score according to the categories is given in Table 2.

Category	Maximum Points	Score	Success percentage
Setting and infrastructure (SI)	1,500	1,050	70.00
Energy and climate change (EC)	2,100	825	39.29
Waste (WS)	1,800	975	54.17
Water (WR)	1,000	400	40.00
Transportation (TR)	1,800	775	43.06
Education and research (ED)	1,800	1,750	97.22
Total score	10,000	5,775	57.75

Tab.2 Percentage of success of BUU Görükle Campus according to criteria and parameters

3.1 Setting and infrastructure (SI)

The ratio of the scores obtained by each of the criteria belonging to this category to the maximum score is as follows. The full score was obtained from 27.3% and 0 points were 27.3% of the criteria in this category (Supplementary Tab.1, Fig.2).

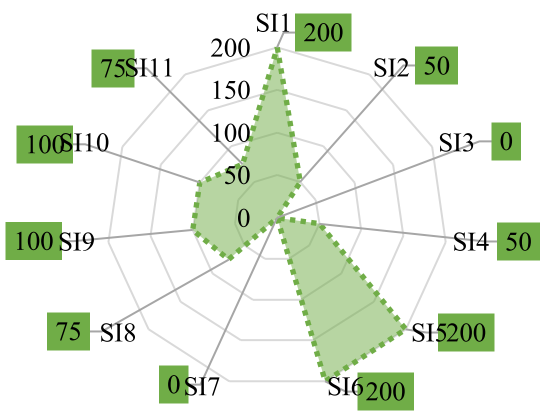

Fig.2 Ratio of the score obtained in the building and infrastructure category to the maximum score

In order to evaluate the criteria of the building and infrastructure category, a map of the land use of the campus was created (Fig.3). The areal values of the campus land uses are given in Table 3 and the proportional distributions of the land uses are given in Figure 4.

Land Use Classes	Area (km^2)	Land Use Classes	Area (km^2)
Green space	6,24	Parking lot	0,08
Farmland	2,61	Roads	1,79
Bare lands	1,94	Pond	0,04
Residential area	1,28	Other	0,28

Tab.3 The amount of land use classes of BUU Görükle Campus

When the land uses were classified, it was seen that 43.73% of the existing areas in the campus belong to green areas (forest-woodland-garden and landscape areas), followed by agricultural lands and bare lands (Tab.3, Fig.4).

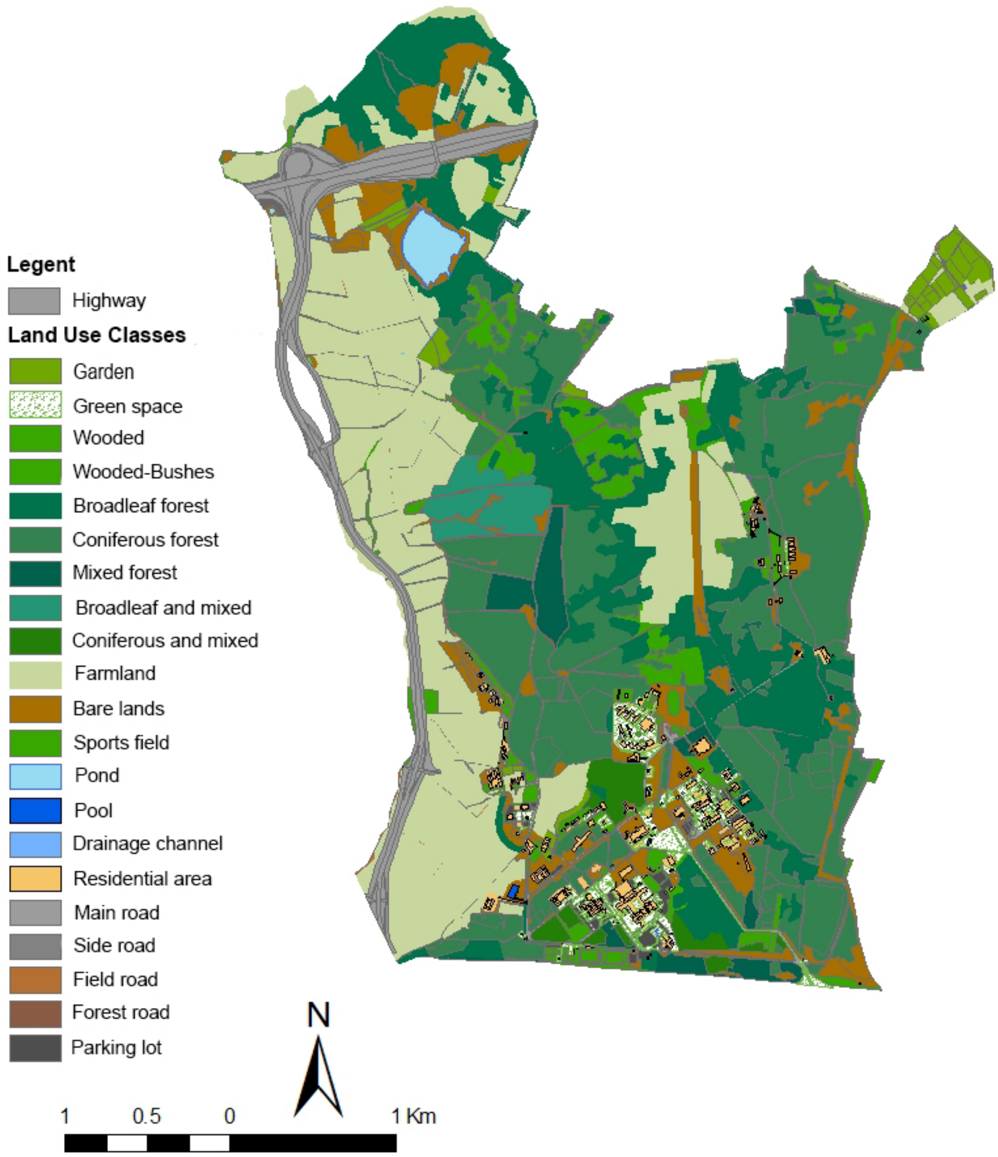

Fig.3 The land use map of BUU Görükle Campus

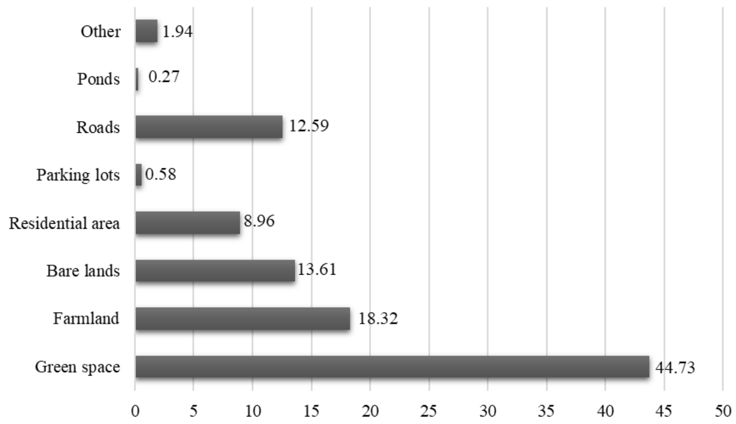

Fig.4 Distribution of land uses of BUU Görükle Campus (%)

The buildings on the campus constitute 8.96% of the total land (Fig.4). The buildings are used for educational purposes at a high rate of 31.57% (Fig.5).

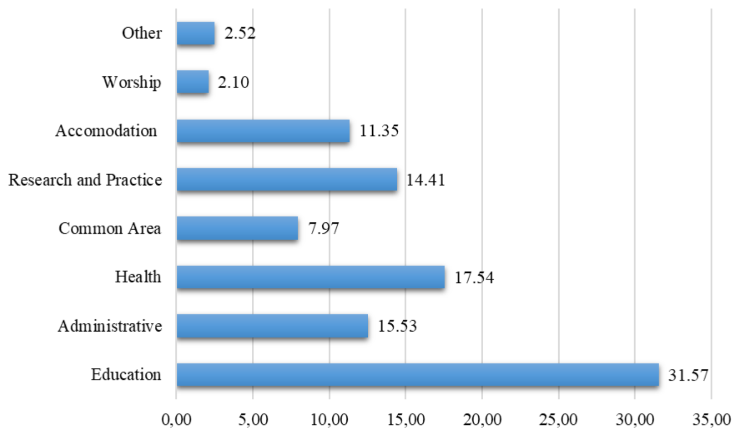

Fig.5 Proportional distribution of buildings in BUU Görükle Campus residential areas (%)

91.04% of BUU Görükle campus land consists of open spaces. 43.73% of these open areas are green spaces. 69.80% of the open green areas within the campus borders are forests, 22.33% of them are wooded areas, and only 7.87% of the open green areas are anthropogenic landscape areas (Tab.4, Fig.6).

Green Space Classes	Area (km^2)
Forest	4.4
Wooded	1.4
Anthropogenic green spaces	0.5

Tab.4 The amount of green areas in BUU Görükle Campus

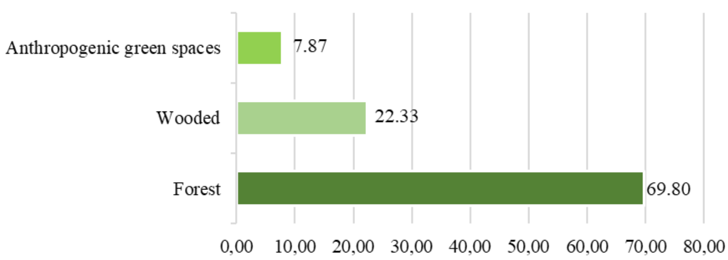

Fig.6 Distribution of green areas in BUU Görükle Campus (%)

3.2 Energy and climate change (EC)

The ratio of the scores obtained by each of the criteria belonging to the EC category of the campus (to the maximum score is as follows. While 0 points were obtained from 20% of the criteria in this category, no full scores were obtained from none of the criteria is remarkable (Supplementary Tab.1, Fig.7).

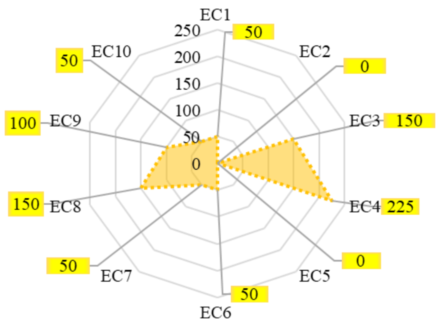

Fig.7 Ratio of the score obtained in EC category to the maximum score

The total energy used in BUU Görükle Campus for purposes such as lighting, heating, cooling, and operation of university laboratories in the last 12 months is 20,959,942,640 kWh. In 2020, the highest energy consumption on the campus was realized in July, August and September. Again in 2020, the ratio of total electricity use within the campus to the total campus population is 380,640,02 kWh.

3.3 Waste (WS)

The ratio of the scores obtained by each of the criteria belonging to the WS category of the campus to the maximum score is as follows. The full score couldn't be obtained from any of these categories. The full score was obtained from 20% of these categories and 0 points were obtained from 40% of them (Supplementary Tab.1, Fig.8).

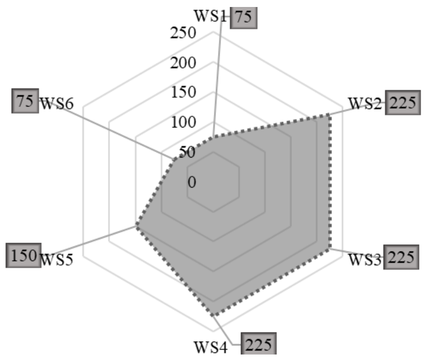

Fig.8 Ratio of the score obtained in the WS category to the maximum score

The wastes generated and recycled within BUU Görükle Campus are recorded and the recycling amount is systematically entered into the nationwide waste monitoring system. There are recycling bins in the buildings on the campus. In this way, organic wastes and recyclable materials (plastic, paper, glass, aluminium, etc.) are separated and sent for recycling. Organic wastes are collected in separate containers. The collected wastes are sent to the landfill by Bursa Metropolitan Municipality. Construction wastes generated on the campus are collected by the district municipality and sent to the Inert Waste Storage area. Waste batteries are collected separately in special containers. The collected batteries are sent to the Exitcom Recycling centre. Toxic wastes produced in BUU Görükle Campus are collected in laboratories within the campus, and when a certain amount of toxic waste is collected, the contracted waste management company is called to collect the waste.

It is connected to the sewerage system of the Western Wastewater Treatment Plant, for which Bursa Water and Sewerage Administration (BUSKİ) is responsible for the sewer line management of BUU Görükle Campus. The campus' wastewater line is connected to the sewage system of the city's Western Wastewater Treatment Plant. The treated wastewater is discharged into the Marmara Sea. However, there is no recycling program for the wastewater produced by the university (Anonymous, 2022c).

3.4 Water (WR)

The ratio of the scores of each of the criteria belonging to the WR category of the campus to the maximum score is as follows. The full score was obtained from 20% of these criteria and 0 points were obtained from %40 of them (Supplementary Tab.1, Fig.9).

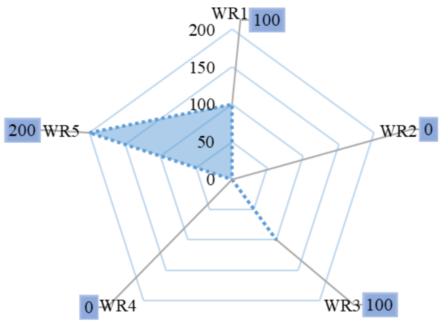

Fig.9 Ratio of the score obtained in the WR category to the maximum score

Yolçatı (Göbelye) pond, which has a maximum operating volume of 645,000 m^3 and an asset volume of 630,000 m^3, is located within the borders of BUU Görükle campus and the water of the pond is used for irrigation of agricultural lands in the campus.

3.5 Transportation (TR)

The ratio of the scores obtained by each of the criteria belonging to the TR category of the campus to the maximum score is as follows. It is remarkable not to get a full score from any of the criteria while getting 0 points from 12,5% of the criteria in this category (Supplementary Tab.1, Fig.10).

Fig.10 Ratio of the score obtained in the TR category to the maximum score

Users providing access to the campus are permanent users (students, academics and administrative staff) and temporary users (service personnel working in university enterprises, patients coming to BUU Medical Faculty Hospital and patient relatives). The average value of the number of vehicles and motorcycles entering BUU Görükle Campus daily was obtained from the camera images taken by BUU security centre. As a result of the examination of the camera images taken from the Görükle Campus security centre, it has been determined that the average number of vehicles entering the campus per day is 5329, and the number of engines is 151. The ratio of the total number of vehicles to the total campus population is 0.10. There are 46 shuttle vehicles operated by the university administration to reduce private vehicles on campus, bus stops that allow transportation to many points of the city, as well as metro lines and campus shuttles.

A carbon footprint calculation based on transportation was made in BUU Görükle Campus. The total carbon footprint (CO^2 emissions in metric tons in the last 12 months) at BUU Görükle Campus is 19561.57 metric tons. The ratio of the total carbon footprint produced on the campus to the total campus population (metric tons per capita) is 0.36 metric tons.

3.6 Education and research (ED)

The ratio of the scores of each of the criteria belonging to the ED category of the campus to the maximum score is as follows. The full score was obtained from 9.1% of the criteria in this category, and 0 points were obtained from none of the categories (Supplementary Tab.1, Fig.11).

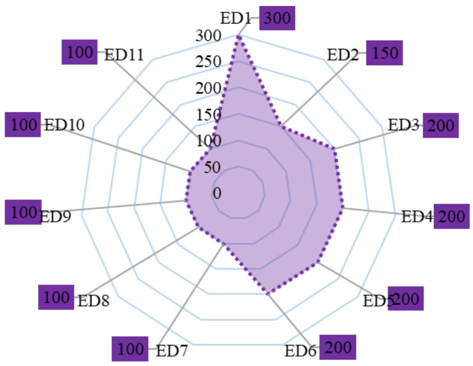

Fig.11 Ratio of the score obtained in the ED category to the maximum score

4. Discussion and conclusion

Based on the evaluation of 6 categories of UI GreenMetric standards, the estimated score obtained from the research results regarding the evaluation of the Bursa Uludag University Görükle Campus sustainable campus concept was 5775 (Tab.2). According to the sustainability report published by BUU sustainability office for the first time in 2021, the 2021 success score of BUU Görükle Campus is 6475 (Anonymous, 2023a). It is seen that there is a 500-point difference between the results obtained in this study and the official results announced by the university. With the data containing the results of our evaluations, it was seen that the differences occurred mostly in the SI and TR categories (Fig.12). This difference can be explained as the inaccessibility of data because this study is a master's thesis and necessarily covers a certain period, some data were not included in the web page user interface during the period (including the pandemic period). The main reason for this difficulty is that some of the literary, visual, geographical, environmental and digital data cannot be shared with individuals within the framework of some legal regulations in our country.

Evaluating the success rates of the campus in each category separately and examining the sustainable practices of universities with high success scores in the GreenMetric rankings will contribute to the sustainability vision of the university.

The total green space of the campus can meet the green space needs of the campus population. In this way, 70% success was achieved in the SI category (Tab.2). To increase the success score obtained in this category, the water permeable area surface and the amount of planted area on the campus should be increased (Supplementary Tab.1). For example, the University of Connecticut, called the USA Tree Campus, has achieved high success in the SI category, thanks to its Tree Care Plan that provides a safe and sustainable campus environment. The purpose of the University of Connecticut Tree Care Plan; making the most suitable species selection for the campus, promote species diversity in the tree population, protect valuable trees during construction works, appropriately replace trees that are lost due to disease and death, track tree planting and removal processes in the GIS environment, and campus residents respecting trees and provides value (Anonymous, 2023b).

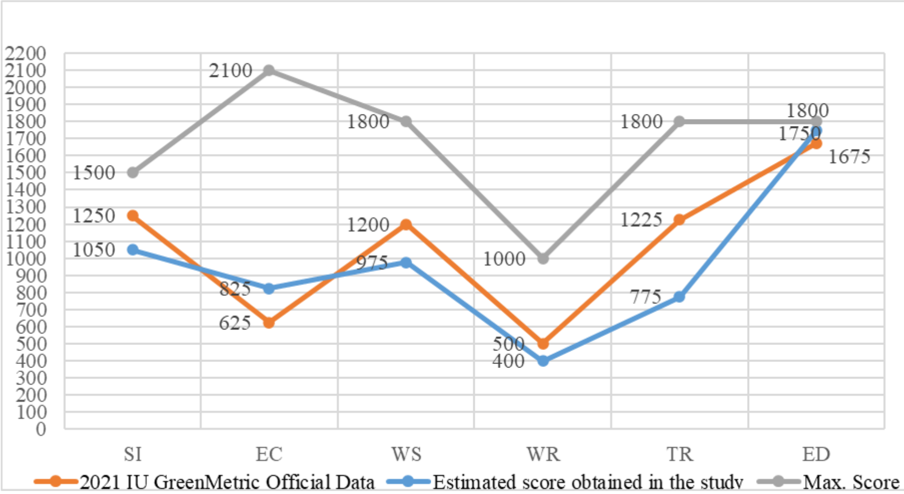

Fig.12. Comparison of the estimated score obtained in the study and the official score of the BUU 2021 IU GreenMetric to the maximum score

54%, 43% and 40% success was achieved in waste, transportation and water categories, respectively (Tab.2). This rate indicates that success below the average was achieved in the aforementioned categories. Establishing a comprehensive recycling program for university wastes in the waste category and adopting innovative solutions, especially for the disposal of sewage waste will increase the score obtained in this category (Tab.2). For example, at Nottingham Trend University, trash cans and signage markings are placed almost everywhere on campus to maximize access to recycling. In addition, with the "Pack for Good" project, 19,467 bags of clothing were donated by students in Nottingham during 2021/22, thus removing 155.5 tons of items from the landfill, saving 917,712 kg of carbon emissions and collecting 272,104 pounds for the British Heart Foundation (Morrell, 2022). Another example of waste management is the University of California wastewater treatment plant. Approximately 1.2 million gallons of wastewater are produced every day on the 5,300-acre campus. With a sanitary sewer collection system, the wastewater discharged from all campus facilities or spilt into the sewer is transported to the treatment plant for processing, where it is made available for use in animal shelters. This innovative sustainable practice helps the campus reduce its waste and carbon footprint while saving approximately $50,000 per year in costs (Anonymous, 2023c).

Reducing the use of vehicles on the campus and expanding the ring service, bicycle use and pedestrian transportation will ensure higher scores in this category. The main deficiencies are the widespread use of vehicles on the campus, the ring service, the use of bicycles and the lack of pedestrian transportation. In this sense, the Almabike Project carried out at the University of Bologna is a good example of popularizing the use of bicycles on campuses. Within the scope of the project, smart bicycles were designed to be given to students free of charge and 600 units were produced in the first place. In case of unauthorized use of bicycles with GPS technology, both movement and stopping stages are tracked through a push-mail system that alarms. In addition, a new public bicycle path was opened in partnership with the university and the municipality to promote the use of bicycles between the campus and the city, and 500 new parking spaces were provided in the city. Following the end of the project, it was determined that the use of bicycles on campus increased from 11% to 24% (Battistini et al., 2022; Anonymous, 2023d).

In the water category, zero points were obtained in both categories due to the absence of a recycling program for the wastewater produced on the campus and the absence of a treatment system (Supplementary Tab.1).

This situation shows that a project should be carried out to recycle the wastewater produced in the campus. An online water treatment facility at the University of Connecticut is a case study in this regard. The facility draws wastewater with a chlorine contact tank and processes the water with membrane microfiltration and ultraviolet light (UV) disinfection. The recovered water is transferred to a finished water storage tank and then pumped for distribution after chlorination. The treated water corresponds to 20% of the drinking water demand on the campus (Anonymous, 2023e).

The lowest achievement in the campus was achieved on the energy category with 39% (Tab.2). It is seen that the lack of attention to the use of renewable energy on the campus, the fact that the smart building application has not been implemented yet and the use of energy-efficient devices in the existing buildings has not been widespread, negatively affecting the sustainability of the campus. Wageningen University is producing the Akifer Thermal Energy Storage system project, which uses the green electricity produced on campus for the heating and cooling of the buildings and greenhouses on the campus. Aquifer Thermal Energy Storage is a sustainable energy source in which heat and cold are stored using a heat exchanger (counter-current device) in a sand pack carrying water 90 meters deep in the ground. This system, it is aimed to cool the buildings with underground water coming from cold wells in summer and to heat them in winter by pumping the groundwater with a heat pump over the same heat exchanger. The project, it aims to save more than 1 hm^3 of natural gas per year (Anonymous, 2023f).

The highest achievement in the campus was achieved in the education category (97%) (Tab.2). In 2020-2022, it achieved the highest success in the ED category at BUU Görükle Campus. This is due to the fact that the ratio of the number of sustainability-related courses to the total number of courses is 25.24%, and the total number of sustainability-related activities is more than 182 (eg. conferences, workshops, awareness raising, hands-on training etc.), the number of scientific publications on sustainability is 5900, and the average research fund of the last 3 years allocated to sustainability research is 934,000 dollars (Anonymous, 2022d).

It is seen that BUU Görükle Campus, which was included in the ranking from 335th place in 2021 with 6475 points, achieved a total of 6740 points in 2022, but took 357th place in the ranking (Anonymous, 2023a; Anonymous, 2023g). This result shows that the sustainable activities carried out on the campus lag behind other world universities. To increase the success achieved, this report needs to be renewed every year and further enriched with various activities and practices. To increase sustainability success of the university and to improve its place in the ranking, the activities planned by the university administration and announced on the web page of the university's sustainability office are as follows (Anonymous, 2022e; Anonymous 2022f; Anonymous 2023h):

- regulation of campus traffic: regulation of traffic signs, renewal of road lines, orderly and safe parking rows, control of on-campus vehicle speeds;
- in-campus lighting: determining the dark spots on the campus and using lighting elements that benefit from renewable energy sources at these points;
- security of forest areas: taking smart security measures in cooperation with the University Police Department at the entrance and exit of the campus forests;
- hazard notification: developing and executing applications that can be used by both students and staff to detect dangerous situations that may occur on campus;
- making a functional map of the campus: creating an interactive map where the features of the campus are accessible from different aspects (security, waste management, energy management, etc.);
- waste management: converting collected electronic wastes into economic value in partnership with Akademi Çevre, Vodafone and BalkanTürksiad, creation of computer and coding classes with the income obtained;

- rainwater harvesting: to use the rainwater to meet the cleaning and irrigation needs of the campus, operations such as connecting the rainwater gutters created on the roof surfaces to the common system and accumulating the collected rainwater in underground tanks.

In addition to the goals that BUU Görükle Campus plans to achieve in order to reach the highest level that can be achieved in terms of energy, water consumption, construction, waste, food and beverage and mobility, and to increase its UI GreenMetric score; equipping the constructed buildings with a sustainable air conditioning system, generating the energy to be used in the buildings with solar panels, using smart devices for lighting and benefiting from renewable energy sources, transforming all kinds of waste produced in the campus into economic value, providing a healthy lifestyle for the residents of the campus with sustainably produced food , keeping food waste to a minimum and reusing organic waste as compost, establishing a sustainable mobility program that supports transportation by public transport, electric vehicles and bicycles, and protecting the campus with its diverse plant and pest communities in mind, and transforming it into a living laboratory where students and researchers work can be cited as examples of activities that should be evaluated.

Supplementary

No	CRITERIA	Point	Weighting
1	**Setting and Infrastructure (SI)**		**15%**
SI1	The ratio of open space area to total area	200*	200
SI2	Total area on campus covered in forest vegetation	100*	50
SI3	Total area on campus covered in planted vegetation	200*	0
SI4	Total area on campus for water absorption besides the forest and planted vegetation	100*	50
SI5	The total open space area divided by total campus population	200*	200
SI6	Percentage of university budget for sustainability efforts	200	200
SI7	Percentage of operation and maintenance activities of building during Covid-19 pandemic	100*	0
SI8	Campus facilities for disabled, special needs and or maternity care	100*	75
SI9	Security and safety facilities	100*	100
SI10	Health infrastructure facilities for students, academics and administrative staff's wellbeing	100*	100
SI11	Conservation: plant, animal and wildlife, genetic resources for food and agriculture secured in either medium or long-term conservation facilities	100*	75
Total		1500	1050
2	**Energy and Climate Change (EC)**		**21%**
EC1	Energy efficient appliances usage	200	50
EC2	Smart building implementation	300	0
EC3	Number of renewable energy sources on campus	300	150
EC4	Total electricity usage divided by total campus' population (kWh per person)	300	225
EC5	The ratio of renewable energy production divided by total energy usage per year	200	0
EC6	Elements of green building implementation as reflected in all construction and renovation policies	200*	50
EC7	Greenhouse gas emission reduction program	200	50
EC8	Total carbon footprint divided by total campus' population (metric tons per person)	200*	150
EC9	Number of innovative program(s) during covid-19 pandemic	100*	100
EC10	Impactful university program(s) on climate change	100*	50
Total		2100	825

3	**Waste (WS)**		**18%**
WS1	Recycling program for university's waste	300	75
WS2	Program to reduce the use of paper and plastic on campus	300	225
WS3	Organic waste treatment	300	225
WS4	Inorganic waste treatment	300	225
WS5	Toxic waste treatment	300	150
WS6	Sewage disposal	300	75
Total		1800	975

4	**Water (WR)**		**10%**
WR1	Water conservation program & implementation	200*	100
WR2	Water recycling program implementation	200*	0
WR3	Water efficient appliances usage	200	100
WR4	Consumption of treated water	200	0
WR5	Percentage of additional handwashing and sanitation facilities during Covid-19 pandemic	200*	200
Total		1000	400

5	**Transportation (TR)**		**18%**
TR1	The total number of vehicles (cars and motorcycles) divided by total campus' population	200	150
TR2	Shuttle services	300	225
TR3	Zero Emission Vehicles (ZEV) policy on campus	200	50
TR4	The total number of Zero Emission Vehicles (ZEV) divided by total campus population	200	0
TR5	Ratio of ground parking area to total campus' area	200	50
TR6	Program to limit or decrease the parking area on campus for the last 3 years (from 2018 to 2020)	200	0
TR7	Number of initiatives to decrease private vehicles on campus	200	150
TR8	Pedestrian path on campus	300	150
Total		1800	775

6	**Education and Research (ED)**		**18%**
ED1	The ratio of sustainability courses to total courses/subjects	300	300
ED2	The ratio of sustainability research funding to total research funding	200*	150
ED3	Number of scholarly publications on sustainability	200*	200
ED4	Number of events related to sustainability	200*	200
ED5	Number of student organizations related to sustainability	200*	200
ED6	University-run sustainability website	200	200
ED7	Sustainability report	100	100
ED8	Number of cultural activities on campus	100*	100
ED9	Number of university program(s) to cope with Covid-19 pandemic	100*	100
ED10	Number of sustainability community services project organized and/or involving students	100*	100
ED11	Number of sustainability-related startups	100*	100
Total		1800	1750

Supplementary Tab.1 The scores of BUU Görükle Campus from each of the IU GreenMetric criteria. Symbol (*) indicates new ratings introduced in 2021 (Altun, 2021).

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Author’s profile

Gamze Altun

Gamze Altun is a PhD student at Bursa Uludag University, Department of Landscape Architecture, and also works as a research assistant in the same department. The researcher's study subjects; sustainable campuses, smart campuses and landscape plants, and climate change.

Prof. Dr. Murat Zencirkıran

Murat Zencirkıran is a professor in the Landscape Architecture department of Bursa Uludag University. He is also the head of the department. The researcher's study subjects; climate change, xeric landscape, landscape plants and endemic plants.