

Assesment of Green Campuses for Sustainable Cities and Society with UI Green Metric: A Case Study of Düzce University

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Abstract

Sustainability is a very important issue for universities. This situation concerning with size of area that they have, number of students, academicians, administrative staff, their excessive consumption of energy and materials. Related to these conditions, Universities have big impacts on environment and nature either explicit or implicit. Certain leading universities have performed comprehensive projects to develop sustainability of the campuses. To understand and assess the efficient sustainability of campuses and universities, lots of evaluation tools have been improved. In this research, Green Metric Index has been used which was developed by Indonesia University (UI) in 2010. This model is one of the most used in the world and evaluates the sustainability of the campuses. This tool uses six main criteria: Setting and Infrastructure (SI), Energy and Climate Change (EC), Waste (WS), Water (WR), Transportation (TR) and Education (ED). Several indicators describe each of the six main categories and these define the significant issues of sustainability. In this paper with the use of observational analyses, Konuralp Campus of Düzce University has been evaluated with using Green Metric Index in terms of Sustainable Campus. In consequence of the research, positive and negative conditions in terms of Green Metrics have been determined and provided suggestions have been developed.

Keywords: Green campus, Green metric, Ecological footprint, Düzce, Sustainability

1. Introduction

Sustainable Campus - Green Campus applications, all over the world and in Turkey, environmentally friendly, energy-saving methods, particularly the country's economy and nature, including all academics, university students, alumni giving better service, campus contributing to sustainable development by creating environmental awareness which the aim of the creation these campuses are spreading rapidly (Anonymous, 2019a). There are many factors under the desire of the campuses to be sustainable and green campus, such as economic targets, quality targets, reduction of non-renewable energy resources, increasing energy costs, ecological effects of global energy use, new technologies, global interest and awareness, environmental pollution,

climate change and ecological health. Universities are aiming to contribute to the expansion of a sustainable lifestyle in society with sustainability practices due to their innovative characteristics and their pioneering roles in the society (Anonymous, 2019a, b).

2. Material and Methods

UI Green Metric used to evaluate the green campus likelihood of Düzce University. UI Green Metric's world universities have been developed fairly and objectively, taking into account the sustainability-ranking model of the universities, the sensitivity of universities to their sustainability and their commitment, their budgets, their green spaces in campuses and many other aspects (Anonymous 2019b, c). The six criteria and percentages of UI Green Metric are as follows: Setting and Infrastructure (%15), Energy and Climate Change (%21), Waste (%18), Water (%10), Transportation (%18) and Education (%18). Within the scope of the study, the indicators included in the UI Green Metric Guide for 2018 were evaluated and the Konuralp Campus of Düzce University was evaluated. Within the scope of the study, interviews were made with Düzce University officials and experts, campus plans, quality targets, strategy document were examined and green campus availability was evaluated.

Although Düzce University was officially established in 2006, the Konuralp campus was founded in 1993 under the Aban İzzet Baysal University in Turkey. Düzce University, about two hours away from the two major metropol of Turkey, Istanbul and Ankara, at the intersection of transportation roads. Düzce province is known as "Green Düzce" and has a big potential of development in industrial, organic agriculture and tourism fields. Although there is rural recreation areas around Düzce province, there are not enough outdoor and green areas of the city center, planned bicycle paths, nature based solutions for the city.

3. Results and Discussion

Within the scope of the study, 38 indicators for the six criteria mentioned above in UI Green Metric Guide were obtained from the documents and the authorities of Düzce University. These indicators can be explain as; for the

criteria of Setting and Infrastructure (15%); The ratio of the open areas to the total area, the ratio of the open areas to the campus population, the area covered with forests on the campus, the area covered with green areas on the campus, the water absorbing area on the campus and the university budget indicators for the sustainability studies were scored. For the criteria of Energy and Climate Change (21%); The use of energy efficient devices, intelligent building applications, renewable energy generation, ratio of total electricity consumption to campus population, ratio of renewable energy production to energy use, green building applications, CO₂ emission reduction program, ratio of carbon footprint to campus population were scored. For the criteria of Waste (18%); The policy of reducing the use of paper and plastic on campus, recycling policy for waste, recycling of toxic wastes, disposal of organic references, indicators of disposal of inorganic wastes were scored. For the criteria of Water (10%); The water-saving program, the water recycling program, the use of the device with water efficiency, the treated water indicators used were scored. For the criteria of Transportation (18%); Ratio of vehicles to campus population, ratio of ring services to campus population, ratio of bicycles to campus population, type of parking lots, transportation applications for limiting special vehicles on campus, restriction and limitation of parking space for private vehicles within 3 years, Ring services, bicycle and pedestrian policy indicators on campus were scored. For the criteria of Education (18%); The ratio of the courses related to sustainability to the total number of courses / modules, the ratio of research budget related to sustainability to total research budget, sustainability related activities, sustainability related activities, sustainability related student organizations, sustainability related web page indicators were scored. As a result of the scoring, it was determined that the Konuralp Campus of Düzce University could not provide transportation, settings and infrastructure indicators which have a significant percentage in the evaluation.

4. Conclusion

In this study, the UI Green Metrics World University Ranking Model for the Konuralp Campus of Düzce University concluded that the campus is not yet sufficient to be a “green campus”, and that it needs to do a lot of

work and practice on this issue. The opinions of the authorities and experts of Düzce University on the green campus likelihood are as follows: The development process of the Konuralp Campus of Düzce University since 2006 is ongoing, the university has a rapid development process, the existence of roads and bicycle parking places that allow the use of bicycles with a student-friendly university approach, the fact that open and green area planning was carried out by the expert team is very important steps in this regard, it is not possible to take the title of green campus in the near future and to be included in the UI Green Metrics World University rankings. Steps to be taken in this context; Firstly, the establishment of the university's green campus strategy document and the coordination of the Rectorate of Düzce University will be the establishment of responsible teams including many different disciplines such as engineering, natural sciences, social sciences and natural sciences. UI Green Metrics Participation in the list of World Universities; In line with the six criteria in the specified methodology, to make improvement studies, to participate in green building and sustainability meetings, to confederation and video conferences, to prepare the University Sustainability Monitoring, Evaluation and Rating System (STARS) report constitute the other important stages of the process. Düzce University, the university selected as the specialization in the field of environment and health in Turkey in 2016, is a university giving direction to work on this issue. Education, screening and scientific studies are carried out to protect the environment and individual health. Informed by the Rectorate to prevent waste of energy and water resources on campus, smoke-free campus and clean campus applications have been initiated and awareness campaigns are organized. Following the steps they follow, the green campus of the university is successful applications in the world and Turkey should start to be implemented in accordance with the possibilities of Duzce University (Patric et al. 2008; Zuhairuse et al. 2009; Mahayudin et al. 2015). Düzce University will lead the projects that can be implemented within the city of Düzce with its green campus applications, and will initiate the process of creating partnerships to reveal sustainability leaders and solve sustainability problems.

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