

# Guest editorial “Innovations in environmental management within higher education institutions (Part 1)”

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Higher education institutions (HEIs) have become vital actors in environmental sustainability. They manage large estates, laboratories, transportation operations, purchasing, food services and waste, while also teaching future professionals and producing knowledge and information. This makes their environmental responsibility go well beyond the practical administration of university facilities, to include the incorporation of environmental priorities in the processes of governance, research, teaching, infrastructure, student life and interaction with local communities.

In the last two decades, there have been many university green-campus programs, resource conservation actions, sustainability policies and environmental awareness programs. In recent times, digitalization, artificial intelligence, circular economy and new methods of evaluation have extended the range of possible actions. However, while the number of actions has increased, it has also made the field more difficult to interpret. It can happen that a university uses technology without creating any environmental benefit, develops green infrastructure without changing its internal processes or creates environmental awareness without setting the processes that make responsible action possible. The current challenge is not simply to create more actions but to understand how they are identified, designed, implemented and evaluated.

This special issue responds to the above-mentioned gap by bringing together research on innovations in environmental management in HEIs. This collection serves as input to the theoretical development of the area while expanding the empirical evidence. *It should be noted that the special issue links two different perspectives that are usually considered independently from each other:*

- From an environmental management perspective, HEIs constitute an organizational environment in which different policy instruments, technologies, infrastructure, behavior change mechanisms and evaluation mechanisms must work as a system. It explores how innovations are designed, implemented and evaluated; under what circumstances innovation helps to increase environmental performance.
- From a higher education perspective, environmental management constitutes an integral component of institutional quality, educational goals and social accountability. It studies how HEIs use their governance, research, education and convening power to impact students, employees, partners and territories where they are located.

The subjects discussed in *Innovations in Environmental Management within Higher Education Institutions (Part 1)* demonstrate the wide range of current research in this field. They cover issues like systematic review, text mining, efficiency measurement, policy analysis, smart technology, green infrastructure, waste management, student resilience and the externality of sustainability of universities. *Following the call for papers and a*



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*meticulous process of academic peer review, Part 1 contains 20 papers clustered into eight themes that are closely interrelated as follows:*

- (1) [Siksnyte-Butkiene et al. \(2026\)](#), [Kurrahman et al. \(2026\)](#) and [Shi et al. \(2026\)](#) examine the issues of conceptualization and measurement of innovation in environmental management. [Siksnyte-Butkiene et al. \(2026\)](#) survey the literature for 2015–2025 on innovations related to circular and resource-efficient environmental management in HIEs, discovering low institutional embedding and digitalization and offering an integrated approach for implementing circularity at HEIs. [Kurrahman et al. \(2026\)](#) adopt a hybrid AI text-mining tool to develop a hierarchical attribute structure of environmental management innovation in HEIs, emphasizing sustainability ranking, reputational pressure, environmental research programs, green building regulations and peer benchmarking for the implementation of innovations. [Shi et al. \(2026\)](#) devise a disaggregated DEA model that takes into consideration the heterogeneity of academic departments and the internal allocation of shared resources within the HEI to distinguish between managerial inefficiencies and structural limitations.
- (2) [Liao F et al. \(2026\)](#), [Liu et al. \(2026\)](#) and [Liao Z et al. \(2026\)](#) focus on the process of the institutionalization of environmental innovation across quality governance and public policy contexts within HEIs. [Liao F et al. \(2026\)](#) use a triple difference-in-differences methodology using listed companies in China, proving that higher education quality positively influences environmental innovation in highly polluting companies by increasing executives' green thinking and reducing corporate greenwashing. [Liu et al. \(2026\)](#) consider the Conservation-oriented Public Institution Demonstration Units as a quasi-natural experiment, revealing that resource-efficient campus construction increases green patents of universities due to increased government attention to the environment, improved energy efficiency and increased financial resources for university R&D. [Liao Z et al. \(2026\)](#) review 39 green education policy papers in China during the period from 1990 to 2025 and reveal that modern policies depend mostly on governmental resources, do not involve markets and society and focus on cultivating talent rather than conducting research and maintaining sustainability on campuses.
- (3) [Wu et al. \(2026\)](#) and [Qin et al. \(2026\)](#) examine environmental innovations at the university level within the wider regional/global context. [Wu et al. \(2026\)](#) assess the dynamics, spatial disparities and determining factors at the provincial level of the coordination of green innovation via higher education and regional digital development in China. Their results show that coordination has progressed over time, but there is a marked east-west divide. [Qin et al. \(2026\)](#) use panel data covering 100 countries and regions between 2022 and 2024, find that technological innovation is conducive to sustainable development of universities through improvement of their environmental, social and governance performance. However, geopolitical risks reduce the positive impact due to disruptions in supply chains, reduced international cooperation and the diversion of organizational resources.
- (4) [Gao et al. \(2026\)](#) and [Zhang et al. \(2026\)](#) examine the environmental implications of smart technologies and artificial intelligence in higher education. By using survey data from 384 Chinese higher education organizations, [Gao et al. \(2026\)](#) find that technological features, organizational readiness and organizational pressure all affect the adoption of smart technologies. The latter improves the

environmental performance due to green dynamic capabilities development; however, environmental dynamism negatively moderates this relationship. [Zhang et al. \(2026\)](#) analyze monthly data from September 2019 to May 2025 with the TVP-VAR-SV method, discover that, at first, artificial intelligence negatively affects research output in HEIs, but in the long term, it positively stimulates it, while carbon consequences of AI-powered growth in research activities are time-varying.

- (5) [Zeb et al. \(2026\)](#) and [Gugercin et al. \(2026\)](#) examine the issue of digital environmental governance through participation, inclusion and communication within HEIs. As evidenced by an interview study involving 25 postgraduate international students at a Chinese university, [Zeb et al. \(2026\)](#) demonstrate that digital tools and automated systems provide an opportunity for embedding sustainability into the daily life of the campus. Nevertheless, due to language obstacles, a lack of integration and ineffective feedback, actual student involvement is restricted, resulting in default sustainability, which relies mainly on automated mechanisms rather than participation. [Gugercin et al. \(2026\)](#) use website content analysis and explainable AI techniques to analyze the signaling of sustainability in universities in Turkey. Their findings reveal that such signals are common, vary depending on the ranking level and correlate poorly with performance.
- (6) [Yu and Meng \(2026\)](#) and [Chauhan et al. \(2026\)](#) examine the contribution of university campuses' environment, strategic intention and institutional competencies to sustainability and innovation. By applying the DEA-Malmquist index and using the data of 31 provinces in China for the years 2008–2022, [Yu and Meng \(2026\)](#) reveal that the increase in green spaces contributes significantly to increasing the efficiency of HEIs' technological innovation, mainly due to better internal management and allocation of resources. Using a two-wave survey of HEIs' representatives in India, [Chauhan et al. \(2026\)](#) show that green strategic intention increases the environmental sustainability of university campuses through two related channels: green campus innovation and green institutional capital.
- (7) [Zhao et al. \(2026\)](#), [Chen et al. \(2026\)](#) and [Lafram et al. \(2026\)](#), address the topic of waste governance and eco-responsible behavior in university settings. [Zhao et al. \(2026\)](#) use a multimethod research methodology to explore how digital feedback affects waste separation behavior of university sports facilities' users, making a link between behavioral intervention and design management of university infrastructures. [Chen et al. \(2026\)](#) suggest closed-loop and data-driven approach combining the use of a deep learning algorithm for the identification of dish-level food waste risks and mixed-integer linear programming for choosing interventions. The goal is to find the optimal balance between ecological footprint reduction, costs of the process and satisfaction of the students, which will result in transition of university food waste management from an experience-based and intervention-based strategy to precision governance. [Lafram et al. \(2026\)](#) base their findings on the results of a survey of 226 university students from Morocco, noting that although the attitudes toward reducing the use of single-use plastics are generally positive, the level of perceived behavioral control and subjective norms is rather moderate.
- (8) [Yen and Li \(2026\)](#), [Khan et al. \(2026\)](#) and [Shen et al. \(2026\)](#) consider the human and social consequences of environmental management in HEIs. [Yen and Li \(2026\)](#)

focus on the interrelations between scientific consensus communication, belief in science and climate change attitudes as related to the climate resilience of university students, putting a strong emphasis on informational and psychological bases of the response to climate change. According to [Khan et al. \(2026\)](#), who conduct semistructured interviews with 20 students at a university in China, green infrastructure helps restore mood and concentration, whereas stressful factors include crowding, noise and unpleasant environments. [Shen et al. \(2026\)](#) develop a comprehensive value accounting system for cultivated lands and utilize econometrics, such as geographically and temporally weighted regression models, to measure the influence of agricultural research resource allocation on cultivated-land values during the period from 2012 to 2021.

This special issue aims to bridge the gap between the growing demand for innovation in environmental management and its effective institutionalization, implementation and scaling within HEIs. The studies reveal that innovation is to be perceived as something more than the implementation of some innovations or the launching of isolated projects. It requires a consistent change of governance structures, policy instruments, infrastructure, research, teaching practices, digital systems and behavioral patterns. In addition, it becomes apparent that the responsibility of HEIs for the environment cannot be assessed at one level only. Within their own institutions, universities should coordinate facilities, information systems, academic and student services in accordance with their sustainability goals. In the campus environment, they have to establish necessary conditions for their students and employees to act environmentally and benefit from this. Outside universities, they can perform the role of centers of knowledge and technology transfer and become an important part of the institutional coordination mechanism promoting sustainable development in the adjacent territories and even in society. Overall, 20 papers presented here provide evidence that successful environmental management innovation presupposes interplay of institutional capacity, technological capabilities, participation of stakeholders and constant evaluation of the process. We believe that our collection will motivate researchers to undertake additional research and practice to make innovation in environmental management an integral part of higher education governance.

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