

## **The Way towards a Sustainable and Green University: A Case Study of the Islamia University Bahawalpur (IUB), Pakistan**

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### **Abstract:**

*For decades, sustainability has been a crucial issue for students, academics, and policymakers. Universities are pivotal in creating a sustainable society by (a) minimizing the negative environmental impact of their activities on society and the economy and (b) encouraging sustainable practices in curricula and research programs. Specifically, a "green university" implements sustainable practices across every aspect of its everyday actions. Yet, sustainability research has been focusing on only specific sustainability issues within the higher education sector and has yet to consider the simultaneous implementation of green initiatives. This study thus bridged that gap by conducting a case study of the green initiatives concurrently implemented by the IUB. The University utilized a comprehensive management framework that ensures sustainability practices in all university activities. IUB has developed specific strategies and well-structured plans for adopting sustainable practices. The most important initiatives at the campus include green infrastructure, plantation, solar energy, paper and plastic use reduction, and awareness campaigns about energy, water conservation, and sustainable mobility. Nevertheless, coordination among all these activities must be further strengthened despite extensive discussions on sustainability issues in teaching and research activities.*

**Keywords:** Sustainable University, Resource Conservation, Green Infrastructure, Environmental Management.

## **I. Introduction**

Societies are currently confronted with social, economic, and environmental issues that require a response from individuals, national governments, and global and local organizations at all levels. One prevalent issue is the challenging need for sustainable economic and organizational growth (Leal Filho et al., 2018), which also affects higher education institutions and university decision-makers in establishing sustainable and green campuses (Marques et al., 2019). This concern is pressing as sizeable public sector universities, relative to small cities, significantly impact society and the environment. Moreover, universities act as "shapers of society's values" by educating current and future generations (Godemann et al., 2014).

Numerous studies have confirmed the importance of higher education in promoting sustainable growth in their operating regions (Fuster et al., 2019). In this regard, universities must then promote sustainable development in society by (a) minimizing the negative environmental impact of their day-to-day activities on society and (b) promoting sustainable development and practices in research, curricula, and extra-curricular activities (Leal Filho et al., 2019). Additionally, national and international declarations have confirmed the positive association between sustainability and higher education (Lozano et al., 2013). The United Nations' (UN) "2030 Agenda for Sustainable Development" and UNESCO's initiative "Education for Sustainable Development" have highlighted the importance of universities in establishing the foundation for sustainable development (Leal Filho et al., 2019). The declarations affirm that universities play a critical role internally as an organization and externally as catalysts in sustainable development (Murtaza & Molnár, 2021).

Theoretically, scholars define a university as sustainable or green if it implements sustainability through all aspects (Murtaza & Molnár, 2021). The literature in this regard reveals that universities have incorporated specific aspects of sustainability into their day-to-day activities, such as teaching, research, curriculum, community engagement, transportation, energy, paper usage, waste management, and accountability reporting. There are green university operations, such as green curricula, green buildings, increased environmental research, and sustainability reporting. Nevertheless, no empirical evidence exists of universities implementing green practices through a one-window operation, particularly in developing countries such as Pakistan. Additionally, only a few studies comprehensively discussed implementing green university programs among European universities (Leal Filho et al., 2019).

Due to the research gap in the simultaneous inclusion of all sustainability dimensions in a university (Yáñez et al., 2019), there is a need to jointly analyze the implementation of all the sustainability dimensions in the higher education setting as a case study. This study aims to fill the theoretical and contextual gap by conducting a case study of the Islami University Bahawalpur (IUB henceforth), Pakistan, through an integrated environmental management approach. The article explores how different sustainability dimensions are incorporated into different dimensions of university activities.

According to the Environmental Kuznets Curve (EKC), the standard economic theory on the environment-income relationship, the environment is not a social priority in the early stages of economic development, where per capita income is low (Grossman &

Krueger, 1995). Thus, this research will also provide new insights into how the higher education administration in low-income countries, such as Pakistan, a low per capita income country, responds to environmental issues.

The rest portion of the article is arranged according to the following format. Section 2 examines the research on green universities. Section 3 outlines the study method, Section 4 discusses the case study's findings, and Section 5 summarises the recap and limitations of the study and offers recommendations for future endeavours.

## **II. Literature Review**

The concept of a green and a sustainable university has been extensively discussed in the current literature on sustainability and the environment, such as Brusca et al. (2018), Velazquez et al. (2006), Fissi et al. (2021), Diniz-Filho and Bini (2019), Abbott et al. (2017), and Wakkee et al. (2019). A sustainable university encompasses three critical pillars: (a) curtailing multifarious broader impacts in terms of economic, social, and environmental, (b) spreading the notion and importance of well-being and good health, and (c) spreading and sharing values globally (Velazquez et al., 2006). A sustainable university strengthens society by manifesting and implementing effective research, teaching, and outreach practices based on sustainability principles to ensure a healthy environment and socio-economic justice (Lozano et al., 2013) as such, a university functioning based on sustainability principles is a “complex system” (Yuan & Lee, 2013).

Fissi et al. (2021) outlined four closely associated dimensions comprising a sustainable university; Teaching, research, campus operations, and community engagement. Prior literature on sustainable universities primarily focusing on campus operations highlights various other dimensions, as identified by Leal Filho et al. (2019), such as green building (construction, functions, renovation, and demolition of university buildings according to sustainability principles) (b) waste management (collection, transportation, and treatment of wastage of offices, labs, cafeteria and general), (c) green procurement (procurement of goods and services by adherence to sustainability guidelines to preserve the University and the environment from harmful environment factors), and (d) sustainable transportation (promoting cycling, car sharing, and the use of vehicles with fewer fossil fuels among students and staff).

The role of teaching and knowledge creation in addressing environmental issues is critical (Murtaza & Molnár, 2021) as there is ample evidence of the benefits of integrating green or sustainability concepts in university teaching and research (Abbott et al., 2017), education, and curriculum (Khan & Henderson, 2020). For Teaching, Stough et al. (2018) suggested that universities introduce courses based on sustainability principles or include sustainability concepts and issues in the curriculum. Consequently, this integration enables the university members to address green issues in different organizations or disciplines they work in (Jabbour et al., 2013). Sustainability research has also been recognized as an exquisite resource to produce and permeate the impetus of knowledge about sustainability.

On the other hand, many universities need to catch up in implementing sustainability programs through an integrated approach (in both teaching and research simultaneously) as they engage in few activities (Glaser, 2016). Despite the plethora of

Higher Education Institutions (HEIs), integrating green or sustainability concepts with the curriculum and research is challenging due to the lack of collaboration among key stakeholders (the faculty, administration, and students) and clear guidelines in the form of sustainability policy and research (Hoover & Harder, 2015; Lozano et al., 2013; Wals, 2014).

Understanding that sustainability research and curriculum are both academic exercises and tools to address environmental issues is vital to promoting sustainability research and curriculum (Waas et al., 2010). To inculcate the research values in sustainability among the academic members, Lozano et al. (2015) recommended participating in sustainability-specific projects, establishing sustainability study centers, and producing high-quality data-driven research (Lozano et al., 2015). Lastly, universities should engage with larger communities and stakeholders (government, local firms, students, employees) as collaboration and values development are instrumental in raising awareness of the sustainable university concept (Sassen & Azizi, 2018; Blanco-Portela et al., 2017). Community engagement includes providing practical training, offering sustainability-based courses, and conducting awareness seminars for the general public and organizations (Sánchez-Barrioluengo & Benneworth, 2019; Secundo et al., 2017).

Adopting the most appropriate strategies for establishing a sustainable university requires full support from the top management and continuous organizational change (Blanco-Portela et al., 2017; Yuan et al., 2013). In other words, the University's top management must be committed to strengthening the team by including new players committed to creating a green university, which contributes to critical structural improvements within the governance and university management (Blanco-Portela et al., 2017). Leal Filho et al. (2019) also highlighted the essential role of green offices and management as a hub of sustainability-related activities to address university environmental issues.

Moreover, the eco-friendly projects and activities at the University also significantly influence the students' attitudes in terms of their social, moral, and cognitive conduct due to the knowledge implementation by young people who are more open to embracing new ideas (Joshi & Rahman, 2017; Manolis & Manoli, 2021).

### **III. Methodology**

As the sustainable university concept is still in its infancy, this study adopted a qualitative approach, a case study method, which is pertinent when knowledge of any phenomenon or issue is elusive (Lune & Berg, 2017) to explore any issues in scrutiny (Lambert et al., 2018; Schober et al., 2021). The University selected for the case study was IUB, as it is one of the most prominent Pakistani universities, with over 650,00 students and more than 45,00 employees. Information regarding the sustainability measures of the University was gathered through semi-structured interviews with university officials, the official website, and the sustainability report.

### **IV. Findings**

This section describes a brief background of IUB, followed by a thorough discussion of the various sustainability practices at the University. Established as an institution in 1925, IUB was declared a university in 1975, which has now become a high-standing institution of research and higher education in Pakistan. The University has

more than 1,500 academic and 3,573 administrative staff, 45 research assistants, about 1,270 doctoral students, and about 65,000 students nationwide. The University currently offers educational programs in social science, natural science and arts in 15 faculties and 126 departments.

Progressing towards a sustainable or green university, the present Vice-Chancellor (VC henceforth) of IUB initiated various sustainable projects with funding from the Punjab Government and other funding agencies to enhance water management and green energy. The University has also launched a comprehensive environmental management program, the Green Campus Project (to be discussed below), to address environmental issues on campus, in line with the concept of a sustainable campus.

#### A. Institutional Framework

Sustainability is among the main deliberate missions of the VC of IUB. The mission reflects the dedication of the University in developing strategies for a sustainable university. It also serves as an institutional framework planned to achieve these targets.

At the start of the fiscal year 2021, the VC of IUB established a directorate of the Green Campus Project (GCP henceforth) to adapt and align the institutional system with and raise awareness of positive environmental behaviors and sustainable goals by engaging key players of the green initiatives. Consisting of a director and an environment management committee (EMC), GCP is responsible for the evaluation and development of the sustainability plan of the University, which includes preparing the annual sustainability report of the University and developing an enhanced sustainability plan. The actions performed by the directorate of GCP are strongly linked to the UN sustainability goals established in 2015 (UNSC, 2015) as part of the National Vision 2030 (Government of Pakistan, 2019). Essentially, GCP adopted an integrated environmental management approach that necessitates cross-departmental collaboration as the EMC consists of diverse domains that display the current IUB stature in terms of environmentally sustainable initiatives (see Figure 4.1). Collaboration increases the likelihood of solution implementation and stakeholder collaboration. Thus, it is pivotal to ensure that the most effective practices are transferred and executed in all organs within the institution (Geng et al., 2013).

**Figure 1: The Environment Management Committee of the GCP.**



The committee's foremost challenge was assessing the existing sustainability echelon and creating a baseline sustainability report for IUB. The first and second sustainability report summarises the progress of IUB towards a sustainable university and introduces the long-term objectives and measures of the management of the environment program. As sustainability becomes more entrenched in the institution's structure, the need for active monitoring increases manifold (Moggi, 2019). Therefore, the annual publication of the sustainability report audits the progress made by the University towards sustainability goals.

### **B. Campus Operations**

Conducting GCP operations that address the different sustainable initiatives necessitates an integrative framework, the Environment Management System (EMS), through the efficient use of resources. The EMS is built on an integrated environmental management approach to address issues of the environment on the university campus, in accordance with the idea of an environmentally sustainable campus. The scope of GCP and pertinent objectives are highlighted in Table -1.

The framework consists of a set of general practices, procedures, processes, and resources for developing, implementing, achieving, reviewing, and maintaining university policy in achieving a sustainable environment (Abubakar et al., 2007).

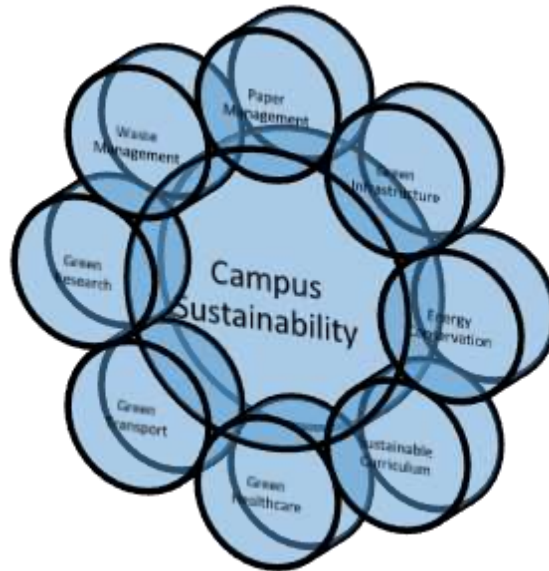
Utilizing EMS thus assigns the University the responsibility for implementing environmental practices (Kralikova & Sobotova, 2019). Many environmental experts recommended that universities adopt and implement EMS in their environmental protection programs. EMS is an excellent tool for managing diverse environmental issues at universities effectively (Barnes & Jerman, 2002), including social and health issues. EMS identifies key environmental performance indicators and evaluates the performance of the University based on said indicators (Lukman & Glavič, 2007). Utilizing EMS at the University would substantially promote environmental sustainability (Lo-Iacono-Ferreira et al., 2018), as EMS continuously assesses and manages the environmental impacts of the university operations with an integrated approach (Sroufe, 2003).

**Table 1. Scope and Objectives of Green Campus Project (GCP)**

Scope	Objectives
Paper Management	<ul style="list-style-type: none"> <li>Optimize paper use per head and increase the digital footprint of the IUB.</li> <li>Promote initiatives to minimize paper use in all academic and administrative activities.</li> </ul>
Energy Management	<ul style="list-style-type: none"> <li>Optimize electricity consumed per head, (kwh/time unit/ number persons).</li> <li>Increase the amount of electricity generated/consumed from renewable energy sources in total electricity generated/consumed at the campus.</li> <li>Optimize gas per head use (CFT/ number of persons).</li> </ul> <p>Promote energy-efficient electric compliance at the campus</p>
Water Management	<ul style="list-style-type: none"> <li>Optimize water consumption per person and increase the share of recycled water in total water consumption at the campus.</li> </ul>
Waste Management	<ul style="list-style-type: none"> <li>Increase the amount of sorted/recycled waste against total generated waste (divided by flows).</li> <li>Promote trash management with sustainability SOPs and compost, resource conservation, recycling, and reuse.</li> <li>Optimize the use of plastic bottles and bags on campus.</li> <li>Promote the initiatives to minimize food wastage in food consumption.</li> <li>Promote the culture of food saving in food selection, cooking, and food usage and promote the initiative to make all food points on campus green food points.</li> </ul>
Green Infrastructure	<ul style="list-style-type: none"> <li>Promote initiatives for green infrastructure: green and integrated buildings, sustainable transportation such as greenways, footpaths, cycleways, preservation of the university landscape, biodiversity, and green spaces</li> </ul>
Green Transport	<ul style="list-style-type: none"> <li>Optimize the use of fuel per head of the University's employees and students.</li> <li>Promote initiatives for sustainable mobility: walk, bicycle, car, and motorcycle pooling.</li> </ul>
Behaviour Management	<ul style="list-style-type: none"> <li>Promote sustainability SOPs for the University's academic, research, cultural, and sports activities.</li> <li>To create awareness about environmental issues of the University and society through workshops, seminars, and conferences.</li> <li>To foster environmentally responsible citizenship and environmental literacy, create an institutional culture of sustainability, and practice institutional ecology.</li> </ul>
Sustainable Research	<ul style="list-style-type: none"> <li>Promote research on environment and sustainability issues and increase funds for research and development on energy conservation, energy efficiency, and water conservation</li> <li>Promote initiatives to take sustainability issues as a research challenge of the University</li> </ul>
Sustainable Curriculum	<ul style="list-style-type: none"> <li>Promote initiatives to include maximum sustainability and environmental issues subjects in graduate and post-graduate classes.</li> </ul>
Green Healthcare	<ul style="list-style-type: none"> <li>Promote initiatives to optimize the use of medicine and health expenditures through green health care practices.</li> </ul>
Green Procurement	<ul style="list-style-type: none"> <li>Promote green and sustainable procurement initiatives and ensure that all goods and services procured by the IUB should have minimum adverse environmental outcomes.</li> </ul>

Consequently, environmental awareness among university stakeholders is raised (Nicolaidis, 2006). EMS is documented and implemented through a set of iterative and continuous procedures, thus improving sustainability practices at the University. Concurrently, using EMS creates a process change toward investment and technological and institutional growth of the University, in line with sustainability goals. The strategic pathway towards a sustainable university (see Figure 2) is outlined in the GCP document approved by the university stakeholders and in the first IUB sustainability report.

**Figure 2: The Elements of Campus Sustainability**



***Green Buildings:***

The essential element of the campus sustainability project is green buildings. In this regard, the master plan of the university infrastructure was revised for a vertical expansion of the University, where new buildings must be at least three stories and follow the standard operating procedures (SOPs) of green buildings. Furthermore, the revision also includes renovating existing buildings for green options. That said, these tasks require enormous financial resources (Ávila et al., 2017; Blanco-Portela et al., 2017), as inadequate funding is a principal obstacle in progressing towards a sustainable university in general.

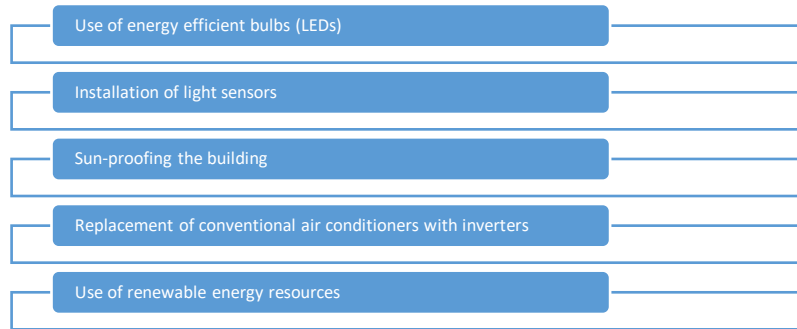
***Energy Savings:***

The core of sustainability is energy conservation, which is vital in minimizing climate change (Gui et al., 2021) and other environmental concerns. Energy conservation can also be economically beneficial as it's often the least expensive solution to the energy crisis and is a greener alternative to increasing energy production. The other benefits of conserving energy include decreasing the depletion of natural resources, constructing fewer power plants, improving the health of people, reducing the effects of global warming and destruction of habitats as well as ensuring a steady, secure water supply, and maintaining stable energy prices. Under the umbrella of GCP, a comprehensive plan was launched to optimize the energy per head use at IUB as part of the energy



conservation objectives (see Figure 3). A comprehensive social media campaign has also been launched to sensitize society about electricity misuse. Additionally, a green youth movement society comprising a team of dedicated students who are representatives from all faculties was also formed to address and curtail faculty-level energy wastage in their respective faculties.

**Figure 3: The Strategies of Energy Conservation at IUB**



IUB has also built a 2.5 MW solar power plant that supplies electricity based on its maximum production capacity, which was supported by the Pakistani Punjab Government (Pro, Office IUB). Moreover, replacing all traditional electrical appliances with energy-efficient ones is also one of the energy conservation measures proposed by IUB, though slowed down by financial constraints, as stated by the VC of IUB.

***Waste Management:***

Implementing waste management practices on campus is also necessary to control environmental pollution (Ebrahimi & North, 2017). The food and plastic wastage control program in GCP aims to endeavor plastic and food wastage control measures as part of the environmental management strategies. As the long-term objective of the program is to transform IUB into a plastic and food wastage-free university, several short-term and other long-term measures have begun.

The University organizes the Eco Food Festival as a quarterly event to raise awareness of sustainable food consumption and waste management. During the festival, students are encouraged to exhibit their interpretation of sustainable food ideologies at a one-day kiosk, raising awareness of eco-social responsibility. The University also aims to establish its recycling plant for waste management and utilization (Director of Estate Care Department, IUB).

The Green Youth Movement (GYM) society members at IUB organized a campaign where they bring their plates, spoon, and water bottle in their bags and use pots at all food points on the campus instead of disposables. In this way, they spread the message that plastic and food waste can be significantly reduced by changing one's behavior, attitude, and lifestyle.

Furthermore, IUB has also installed water dispensers to mitigate plastic bottle use as this initiative may support the "routinization" of a sustainable consumption practice (Thongplew & Kotlakome, 2019). The hostel management of the IUB also supported this initiative by providing students with a set of spoons, plates, and water

bottles. Though this initiative can be considered simple, the potential academic influence on the younger generation is relatively strong.

Lastly, 100 volunteer students of IUB joined and will be joining the "Plastic Free July Eco Challenge" (<https://plasticfree.ecochallenge.org/>) in 2022 and 2023, respectively. "Plastic Free July" is a 31-day global eco-challenge based in Australia that targets optimizing plastic use (<https://ccsc.iub.edu.pk/success-stories>). By joining this program, IUB students have been learning to adopt green habits (plastic-free). Students also shared their achievements, successes, and experiences throughout the course with their fellow challengers from around the world, which included combining shared inspiration with camaraderie, friendship, and contests. Resultantly, the activities allowed the change to be more manageable and fun.

***Paper Management:***

A more straightforward and popular approach to sustainability is to reduce the amount of paper consumed by the campus (Fissi et al., 2021; Smyth et al., 2010), as the education sector is one of the largest paper consumers. Higher paper use leads to more deforestation as papers are made of trees. Moreover, paper production is a pollution-intensive production process. For teaching faculties, participating in campus paper reduction efforts means adopting practices that lessen the amount of paper needed to conduct a course and its relevant assessments. The Paper Management division of GCP proposed undertaking the following measures to reduce paper use in exams, save costs for the University, and introduce a more objective and assertive means of assessment:

1. If conducted on campus in pen and paper format, all faculties may have the option of conducting mid-term exams based on multiple choice questions (MCQ) to save paper use for answer sheets. The MCQ-based exams may be conducted if deemed appropriate by the course instructor and respective head of department (HOD), provided the nature of the course is quantitative and allows for objective assessment.
2. The pages of answer sheets for mid-term exams may be reduced to half of the previous size (six double-sided pages instead of 11) as half of the answer sheets are usually filled by the student with the rest left blank.

The Institute of Business, Management, and Administrative Sciences (IBMAS) and the Economics Department at IUB were selected to implement these measures in a controlled environment. Mid-term exams were conducted in the form of MCQ without conventional answer sheets, which reduced paper use and resulted in a more objective evaluation.

For research thesis examination, using both sides of the page, single-line spacing, and content optimization has been proposed to reduce over half of paper use and is currently in the final stage of approval by the Board and Advanced Studies of IUB. The present administration has significantly increased the digitization of the university functions, from admission to job application and fee submission, which consequently replaces the paper footprint due to the increased digital footprint. In the long term, IUB aims to establish a paperless campus through its integrated Learning Management System, as stated by the VC.

***Fuel Management:***

Transportation fuel consumption is among the biggest causes of environmental degradation. Therefore, a sustainable university should have an environmentally sustainable model for mobility. Nevertheless, IUB owns an extensive and effective transportation system to cater to its stakeholders, thus incurring a massive cost of fuel and other supporting elements such as lubricants and mobile oil. Hellmanzik (2013) suggested that green transport initiatives include the use of green transport to reduce carbon emissions. The University, too, has started many initiatives to optimize transport fuel consumption throughout the University.

Firstly, hot spots (where students are more in number) within Bahawalpur City were identified to direct shuttles. Secondly, different academic departments collaborated with the transportation department to manage and deploy shuttles during the peak hour of classes based on the timetables. Thirdly, driver training was proposed to enhance the drivers' fuel-saving driving skills. Fourthly, several awareness sessions were conducted in different faculties and departments to encourage less fossil fuel consumption and vehicle sharing during office hours. Fifth, several cycling events were also conducted to promote cycling within the University and locality. Furthermore, every Friday is celebrated as a less carbon day to promote commuting by bicycle, pool motorcycle, or car among staff and students to mitigate their carbon footprint (Head of Transport Management, IUB).

An app is also being co-developed with the Computer Science department to provide students with sustainable rideshare solutions. Resultantly, students could carpool and share bike rides to the campus, further reducing fuel use per head. Moreover, the app would also enable a live tracking feature for buses and cars to ensure timely and efficient transportation.

***Teaching:***

The University should teach students and the public about the environmental and sustainable aspects of sustainability in addition to preparing future professionals and specialists (Stough et al., 2018). For instance, to enhance soft green skills, sustainability topics should be covered in science, the management sciences, humanities and technology (Leal Filho et al., 2018). Given that 80 percent of university staff workers are between the ages of 19 and 26, investing in a sustainable future through environmental education is important, according to the VC.

It is possible to look both horizontally and vertically at how sustainability has been included in IUB's curriculum. In all undergraduate programs across all faculties, the University has included an introductory course about sustainability and the environment. From a vertical standpoint, the Faculty of Agriculture also grants a comprehensive degree in environmental science. The curriculum division of GCP has also broadened the variety of fields offering environmental-related courses. For example, the departments of Economics, Psychology, and Political Science have presented resource and environmental economics, environmental behavior, and political ecology. More environmental-related courses will be established in other fields in the future.

**Research:**

Identifying the socioeconomic and technological solutions to environmental problems related to agriculture, industry, commerce, and trade is an academic challenge for IUB in progressing toward a sustainable university (Director of ORIC, IUB). A sustainable university also promotes research on sustainability issues, as evidenced by increased funding for research and development on energy conservation, energy efficiency, and renewable energy development (Fuster et al., 2019; Waas et al., 2010). Similarly, IUB has been participating in various environmental and sustainability-related research publications, projects, and conferences. For verification, the online repository of the Office of Research, Innovation, and Commercialisation (ORIC) of the IUB was searched for articles, book chapters, and other research publications related to the environment and sustainability using the terms "sustainability" and "environment" for the search. Resultantly, there was a total of 898 environmental and sustainability-related publications in both natural and social sciences in 2022.

The University is also participating in many research projects and conferences funded by various national and international institutions to identify solutions to local, regional, and global environmental issues. In this regard, the IUB-hosted Inter-Universities Consortium on Climate Change, Sustainability, and Conservation (CCSC), in 2022, where 60 universities, research organizations, industries, and NGOs participated in. The consortium aims to go beyond borders to work together in tackling the major problems in relation to agriculture, climate change, food security, climate change as well as sustainability.

**Community Engagement:**

The University should organize community projects to promote environmental awareness and communicate information on environmental management and sustainability among the local community (Leal Filho et al., 2019). Communication is a powerful tool for improving actions and sensitizing communities to sustainability issues. As such, transparency and openness about IUB green initiatives with all the involved parties are instrumental in following the (VC). For example, the day-to-day operations at the University are exhibited before the local community, as the University should be a center for local communities to learn environmental practices.

The main communication channels of IUB are the official website, digital magazines, newsletters, and press releases on local, national, and international media. The University shares information with the community through these platforms regarding its activities and sustainability initiatives. The primary medium for communicating information on sustainability initiatives is a separate site of the University's official website (<https://www.iub.edu.pk/gcp> and <https://ccsc.iub.edu.pk/>). The IUB is also active on major social media, such as YouTube, Instagram, Facebook, LinkedIn and Twitter.

The IUB needs to develop more initiatives and devise more specific strategies to engage students, faculty, and the public in sustainability initiatives, as community engagement is integral in the transition of a university toward sustainability (Blanco-Portela et al., 2017). By sensitizing the community to environmental concerns, the University promotes sustainable lifestyle practices within the community (Ávila et al., 2017). For instance, in IUB environmental and sustainability events, cycling is celebrated together with the local community. Similarly, the local community has been made

involved in research theses and conferences across different disciplines, thus addressing environmental sustainability and climate change. A total of 30 international days are dedicated to the environment and sustainability, all of which are observed by IUB (Pro, IUB).

***Accountability and Reporting:***

The University has been producing its 2020-2021 and 2021-2022 sustainability reports. These reports were prepared following the guidelines of the Global Reporting Initiative (GRI) recommendations which is the most widely-accepted report on sustainability by private and public institutions (Yanez and others. 2019). The reports explicitly reference the sustainable development objectives (SDGs) the University has implemented through its actions.

The reports are an integrated system of environmental accountability for IUB that comprehensively cover the environmental and sustainability goals and projects. The sustainability reports allow universities to communicate their performance and actions and interact with various stakeholders (Brusca et al., 2018). Moreover, from an entrepreneurial standpoint, the sustainability report emphasizes the work of IUB alongside other national and local partners to create an innovation ecosystem and aid spin-off and start-up programs. Nonetheless, the most significant concern is that sustainability reporting is at risk when there is a change in the university management. One possible solution is to transform sustainability reporting into an organizational goal, as stated by The Registrar of IUB.

**V. Conclusions and Recommendations**

Research on the role of higher education institutions in developing a sustainable society has increased due to their profound economic and environmental impact (Marques et al., 2019). Nevertheless, current literature focused on specific aspects of sustainability in universities, few studies indicated the inclusion of sustainability practices in all university operational dimensions within a holistic approach. This study, therefore, attempted to fill this gap by examining the transition of IUB towards being a green university through an integrated environmental management system.

The findings of the research endeavour indicates that IUB has developed clearly defined strategies and well-structured initiatives to establish sustainable practices at the University. The institutional body recognizes the importance of creating a suitable institutional framework, and the present VC strongly supports the green transition. This evidence supports Blanco-Portela et al. (2017) and Leal Filho et al. (2019a) recommendations that institutional framework and top management commitment are the primary drivers of establishing a sustainable university. Thus, future research may investigate, through multiple case studies, the institutionalization level of green universities in different geographical locations.

The sustainability initiatives of IUB aim to address the primary sustainability concerns of the University, which are (a) green buildings, (b) optimizing energy, water, paper, and plastic usage, and (c) promoting sustainable mobility. Nevertheless, the findings revealed a significant constraint to achieving these goals; the lack of financial resources. Contrary to previous studies that considered such initiatives as individual entities, this study recommends analysing the initiatives jointly to examine whether a

specific university has executed them merely as a "greenwashing approach" or to realize a practically sustainable and green university.

The study also discovered the implementation of sustainability practices where research and teaching are carried out. For example, sustainability-related courses in almost all disciplines (horizontal perspective) and complete sustainability programs (vertical perspective) are offered at IUB. The number of environmental and sustainability courses will also be increased through GCP. Similarly, a large portion of research publications on environmental and sustainability issues was identified in IUB (ORIC). Additionally, the coordination between research and teaching in implementing sustainability initiatives improved since GCP began, as teaching and research are the media through which sustainability issues can be diffused and addressed simultaneously. This observation is consistent with the evidence that teaching and research are the traditional core functions of a university to which most financial resources are devoted. The University has also been involved in multiple projects funded by the Higher Education of Pakistan (HEC) and other national and international institutions where transparency is essential when documenting public funding (Del Sordo et al., 2016).

The University has deployed several strategies to engage and sensitize the local community to sustainability issues. Although the results are still in the early stages, local community involvement is a crucial aspect of a green university (Blanco-Portela et al., 2017). Hence, future studies must further investigate the role of community engagement in green transition due to the instrumental role of stakeholders.

Theoretically, this study provides the first on-field evidence of holistic implementation of green initiatives in all sustainability dimensions at a green university in Pakistan, a developing country. This study contributes to the research gap of holistic initiatives implementation and provides an opportunity for future studies to investigate a green university model. Moreover, this study also contributes managerial implications for university managers interested in holistic sustainability.

A limitation of the study is the generalized finding, as the subject of the case study was only one of the many universities in a developing country. Nevertheless, future studies can apply the green framework of IUB to other green universities or academic institutions for a general framework of a green and sustainable university. Lastly, replicating this current research to monitor the progress of IUB towards a green university is beneficial to better understand the institutional sustainability-oriented efforts.

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