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From Sustainability to Superiority: Exploring the Impact of Green Metrics on Global University Rankings

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ABSTRACT

Universities in worldwide dealing with changing landscape of expectations and duties in an era marked by serious environmental issues and a raised awareness of the need for sustainable practises. The paper digs into how green measurements have altered international rankings of universities and how sustainable practices have paved the way for academic excellence. This study reveals the complex interplay between sustainability initiatives and university rankings on a global scale by employing a combination of quantitative analysis of green metric data and qualitative insights obtained from extensive stakeholder consultation for to reveal the role of UI Green Metrics for global university rankings. Universities all across the world are beginning to include sustainability into their institutional culture thanks to green metrics like the University of Indonesia Green Metric World Ranking. Sustainable practices, academic innovation, student and staff involvement, and the enhancement of the university's reputation are all part of this sea change. Concurrently, this establishes universities as influential catalysts for transformation, advocates for sustainability-oriented education and research, and well-positioned to deliver significant contributions to the overarching international sustainability agenda. Central to this paradigm shift resides the Green Metric, an efficacious instrument designed to assess and quantify the dedication of universities to sustainability.

1. INTRODUCTION

University ranking systems were created in many nations around the world due to the demand for information about universities and the need to compare each university (e.g., Australia, Canada, the UK, and the US), but Global University Rankings (GURs) quickly replaced and are an essential tool for understanding a university's performance, productivity, and quality in relation to its position in these rankings [1]. In order to gauge university performance, GURs were introduced after 2003. Universities apply a variety of approaches to measure universities' Intellectual Capital (IC) and evaluate university administration using metrics related to intangible assets, such as organizational reputation or institutional prestige [2]. The Academic Ranking of World Universities (ARWU), also known as Shanghai Ranking's Academic Ranking (est. 2003), the Quacquarelli Symonds (QS) World University Rankings (est. 2004), and the Times Higher Education (THE) World University Rankings (est. 2010) are the most prevalent performance-based ranking systems for universities at the moment [3]. These GURs take into account a number of factors, such as productivity, citations, awards, reputation, etc., whereas others, such as Ranking Web of Universities or Webometrics (since 2004), Leiden and Scimago, exclusively take into account bibliometric indicators [4].

Higher education institutions' involvement in promoting environmental sustainability extends beyond research activities to include updating their curricula to include environmental and sustainability-related courses and making campus infrastructure more environmentally friendly. As a result of this shift, "green metrics," or assessments that gauge an institution's commitment to sustainability, have been incorporated into the standards used to determine worldwide university rankings. The relationship between sustainability and academic success is no longer just a theoretical idea; it now plays a crucial role in determining how well-known a university is on the global arena. Universities' involvement in addressing these issues has never been more crucial as societies battle the effects of climate change, resource depletion, and socioeconomic inequality. The relationship between sustainability and academic success is no longer just a theoretical idea; it plays a significant role in determining where a university stands internationally [5]. The role of universities in addressing society's problems with socioeconomic inequity, resource depletion, and the effects of

climate change has never been more crucial. The question that follows is: to what extent do sustainability initiatives translate into academic excellence and international recognition, which becomes the purpose of this study.

Universities must help society overcome the major problems of the twenty-first century, including the escalating environmental and socioeconomic crises, global wage disparities, and political instability [5]. To do this, universities must incorporate the notion of sustainable development into present and future organizations, research, and education through educating professionals in the knowledge, competencies, and skills necessary to address ecological, social, and economic issues affecting entire societies. The administration of higher education institutions' environmental sustainability, however, exhibits a significant deficit when organized in accordance with the environmental management performance idea [6]. Due to all of these factors, universities are crucial in the adoption of policies for education that are focused on sustainable development. These policies must be set up in several dimensions and apply a holistic and integrative approach to all of the sectors that sustainability encompasses. The university's capacity to manage internal university processes (by learning from its peers) and its capacity to create the correct graduates and knowledge should both benefit from systematic engagement initiatives, it has been argued [7]. According to one study, the majority of the institutions that were looked at do not yet appear to be fully utilizing the relationship between economic effectiveness and socio-environmental efficiency [7]. This circumstance might hinder the spread of sustainability ideas in university governance.

Green policy implementation on campuses is frequently the first move higher education institutions take in the direction of the environment [8]. University primarily focused on indicators of energy efficiency, but in order to achieve overall long-term sustainability, priority must also be given to other factors including waste management, protecting and conserving water, transportation, and research [9]. Despite the fact that people have not received enough attention, campus green spaces can offer significant advantages to their users [10]. Because this heavily contributes to campus transportation, use energy and water, produce garbage, then universities have a substantial impact on greenhouse gas emissions. The 17 Sustainable Development Goals (SDGs) of the United Nations Development Programme (UNDP) also demand that universities reach their SDG objectives by 2030.

On the basis of the University of Indonesia Green Metric indicators, this journal examines several facets of sustainability and examines the effects these indicators have on the university's standing, competitiveness, and ability to attract students and researchers [11]. Prior to this study, there was a scarcity of research examining the correlation between sustainability and rankings of global universities. Despite the fact that numerous universities have implemented sustainability initiatives, the global impact of green metrics on their rankings remains poorly understood. Combining qualitative and quantitative analysis, this study will address this deficiency by demonstrating how sustainability, as measured by green metrics, affects the global rankings of universities. Through the integration of quantitative data obtained from various ranking sources and qualitative insights provided by university stakeholders, this study aims to enhance comprehension regarding the correlation between sustainability initiatives and the international accomplishments of universities.

2. METHODOLOGY AND APPROACH

In addition to reputable global university ranking systems, quantitative data will be gathered from the Green Metric World Ranking of Indonesian Universities. The significance of the relationship between the university's global classification and its performance on green metrics will be determined through the application of statistical analyses, including correlation and regression. A proportionate representation of various regions, institutional sizes, and transfer initiatives will be ensured through the purposive selection of the university sample. Ensuring adherence to ethical guidelines pertaining to safeguarding sensitive data and obtaining informed consent from participants throughout the entirety of the research process. Nevertheless, this study also recognizes possible constraints, including the accessibility of data and the influence of subjectivity in the compilation of quantitative data. This research method is depicted in Figure 1.

The primary objective of this study is to furnish a thorough comprehension of the influence that green metrics have on international university rankings and to persuade stakeholders in the higher education sector to adopt such metrics themselves. The findings are anticipated to offer policymakers, universities, and desirability advocates practical advice on how to effectively employ green metrics to bolster global recognition and desirability initiatives.

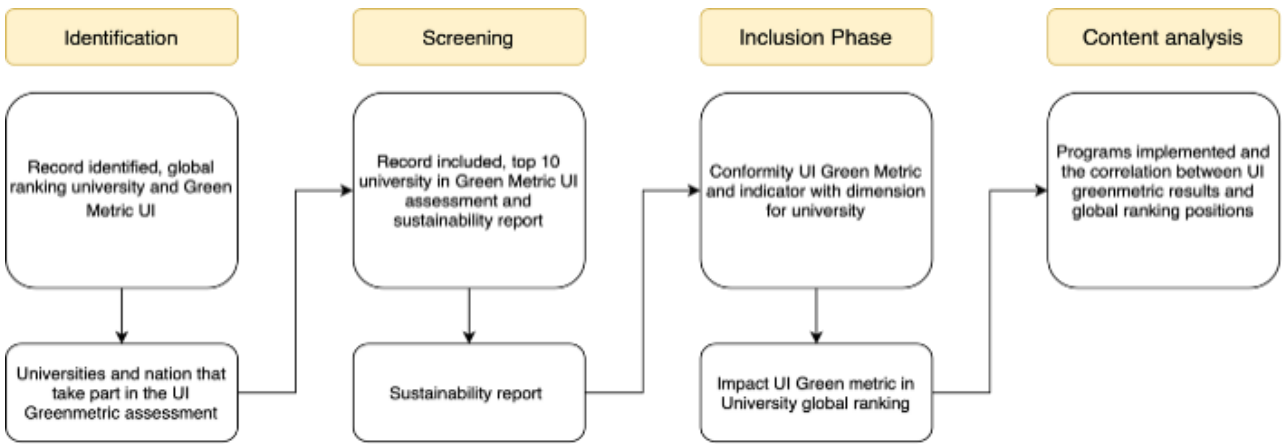

Figure 1. Methodological research

3. RESULT AND DISCUSSION

3.1 Sustainability and higher education

Higher education institutions' responsibilities now go beyond the bounds of traditional academic disciplines. Miller et al. [12] explain universities are forced to adapt and adopt a more expansive mission due to growing environmental concerns and a societal emphasis on sustainable practices, this transition involves an institution's courses, campus infrastructure, and general commitment to promoting environmental sustainability, this goes far beyond research activities. Through their research activities, universities make a substantial contribution to sustainability, researchers at each university are actively involved in researching and tackling a wide range of environmental issues, including biodiversity preservation, climate change mitigation, and sustainable urban development [13]. Universities also play a crucial role in preparing the next generation of professionals to address ecological, social, and economic problems on a global scale by providing them with the knowledge, skills, and competences.

Universities are taking concrete actions outside of the classroom to implement sustainable practices on their campuses, these efforts are visible in the green programs and policies that colleges have been putting in place. Universities frequently begin with energy efficiency indicators, such as retrofitting buildings with energy-efficient technologies, putting renewable energy options in place, and enhancing heating and cooling. These actions not only lessen their negative effects on the environment but also significantly lower costs for institutions. But campus sustainability goes much beyond energy conservation, also includes other crucial elements like waste management, water resource conservation, sustainable transportation, and encouraging green spaces on campuses.

3.2 Higher education challenge

While academic programs and campus initiatives at universities have helped to advance sustainability, there is still a serious lack in the efficient administration and management of environmental sustainability efforts. Sustainability initiatives frequently lack coordination between different departments and universities and are scattered, due to this fragmentation, efforts may be duplicated, resources may be allocated inefficiently, and opportunities for synergistic collaboration may be lost. Purcell et al. [14] explain universities also commonly struggle to integrate their sustainability goals with more general institutional goals, depending on how sustainability is prioritized within a university's governance systems, sustainability efforts may be implemented inconsistently and in fragments.

Universities must create comprehensive sustainability policies that include all aspects of their operations in order to effectively solve the organizational challenge, such regulations ought to cover administrative procedures, purchasing tactics, and financial judgments in addition to academic institutions and campus infrastructure. A comprehensive framework for sustainability policy ties sustainability into the university's mission and vision and aligns it with long-term strategic objectives, including students, teachers, staff, and administrators in group initiatives to lessen the institution's environmental impact and advance responsible resource management, it develops a culture of sustainability.

3.3 Higher education initiatives

Due to their infrastructure, energy use, transportation needs, and trash production, universities as physical entities have a significant ecological footprint, many higher education institutions have started extensive campus green projects with the goal of decreasing their environmental effect and promoting a sustainability culture within their populations as aware of their responsibility as environmental stewards and pioneers in sustainability [15]. Improving energy efficiency and lowering energy use are essential components of campus sustainability projects, to do this universities are using a variety of initiatives, such as renovating buildings with energy-efficient technologies, putting in place smart lighting and HVAC systems, and enhancing energy management through data-driven methods [16].

Sustainable campus operations also include effective waste management techniques, to reduce the amount of waste transported to landfills, universities are adopting comprehensive waste reduction and recycling programs. This includes the creation of recycling facilities, initiatives to separate waste, and educational campaigns to promote ethical waste disposal among faculty and employees. Organic waste is being diverted more frequently for composting, which benefits soil improvement and sustainability objectives. Moreover, conserving water is essential, especially in areas where drought and water scarcity are common, universities are deploying low-flow plumbing fixtures, real-time data-driven irrigation systems, and water-efficient landscaping techniques. To lessen the pressure on potable water sources, greywater recycling and rainwater harvesting techniques are also being investigated. Promoting environmentally friendly mobility is essential for minimizing the negative environmental effects of university campuses, there are initiatives to increase access to public transit, extend bike-sharing systems, and encourage carpooling and ridesharing. To save pollution, several colleges are even switching entire fleets of cars over to hybrid or electric models.

Beyond aesthetics, campus green spaces have several advantages. For example, support biodiversity, offer recreational spaces for faculty and employees, and contribute to better air quality. The establishment and upkeep of green spaces, frequently combining native and drought-resistant plant species, is becoming more and more of a priority for universities. Many colleges are adopting sustainability reporting systems and rules to monitor progress and improve transparency, these reports give a thorough analysis of the institution's environmental, social, and economic performance while outlining its sustainability accomplishments, ambitions, and difficulties [16]. Universities are also creating departments or offices dedicated to sustainability that are in charge of directing and organizing campus sustainability initiatives.

Lastly, students benefit greatly from the educational possibilities that campus green projects offer, universities may build real-world learning environments where students can experience and interact with sustainable methods. This is done by integrating sustainability into the built environment, with the help of this experiential learning method, which supplements regular classroom instruction, students are given the knowledge and abilities to deal with sustainability concerns in the real world. For instance, campus green spaces are frequently employed as learning environments in sustainability-focused courses so that students can study plant

biodiversity, ecosystems, and ecological restoration. Students studying engineering and architecture use energy-efficient building designs and renewable energy installations as case studies, programs for recycling and waste reduction provide information on sustainable waste management techniques. With the help of these experiences, students may advocate for sustainability and find solutions to problems in their future employment, initiatives to promote sustainability on campuses also inspire interdisciplinary research opportunities.

3.4 Sustainable development goals and higher developments goals

Higher education institutions are essential to accomplishing these challenging objectives by 2030, universities are incorporating these global goals into their strategic plans and mission statements in order to contribute to the SDGs in an effective manner [17, 18], this integration entails matching academic curricula to SDG-related subjects and promoting research that specifically addresses the objectives. Universities are also promoting responsible consumerism, resource conservation, and equitable behaviours by integrating sustainability ideas into their campus operations, SDGs are being advanced through research, which is spearheaded by universities [17, 18]. In topics including renewable energy, sustainable agriculture, public health, and social justice, researchers are looking at novel solutions, policy and practice, assisting governments and organizations in making decisions based on the best available data in order to accomplish the SDGs. Interdisciplinary cooperation is a defining characteristic of SDG-focused research, researchers from several fields collaborate to handle complicated problems that call for interdisciplinary approaches [19]. These partnerships encourage innovation and creativity, hastening the realization of the SDGs.

Universities are dedicated to coordinating their operating procedures with the SDGs in order to set an example, this includes establishing sustainability goals for cutting back on energy use, waste, water use, and carbon emissions [20]. Universities are also making moral considerations about their purchasing practices, making sure that their supplier chains follow ethical, sustainable, and socially responsible guidelines [21]. Additionally, campus sustainability activities frequently go beyond the limits of the university, universities collaborate with the community to advance sustainable development and the SDGs' local implementation [22]. In order to jointly address global challenges, this outreach enhances collaborations between academics, government, civic society, and the commercial sector, universities actively contribute to a more sustainable and just society by incorporating the SDGs into their objectives, academic programs, research endeavors, and campus operations [23, 24]. This is in addition to training the next generation of leaders.

3.5 University of Indonesia green metric world ranking

Initiated by Universitas Indonesia, the UI Green Metric World Ranking is a trailblazing project that has greatly influenced the global conversation on sustainability in higher education. In response to the rising significance of sustainability in higher education, the UI Green Metric World Ranking was first created in 2010. In order to evaluate universities' efforts to be sustainable on a worldwide level, UI set out to develop a comprehensive and standardized assessment method. This was done in recognition of the importance that universities play in tackling global environmental concerns, the ranking's main objective is to motivate colleges to give sustainability top priority and to highlight their achievements to the whole community [25]. The rating gives colleges useful information about their strengths and areas for development by quantifying and evaluating sustainable actions [26]. Additionally, it acts as a forum for institutions dedicated to sustainability to collaborate and exchange best practices, University of Indonesia's dedication to sustainability goes beyond operational procedures to incorporate elements related to education and research. The inclusion of sustainability in its educational activities, research endeavours, and community involvement programs is in line with the organization's overarching objective of promoting knowledge and addressing societal issues in Indonesia and elsewhere.

The university's reputation and competitiveness have significantly improved as a result of the inclusion of sustainability in UI's fundamental values and strategic initiatives. High ranks in sustainability evaluations, particularly the UI Green Metric, have established UI as a pioneer in sustainability research and education, not only in Indonesia but also internationally. Table 1 outlines the categorization of the ranking system and its indicators, to reveal university sustainability. This designation also makes it easier to work with foreign partners, which promotes research initiatives, student exchanges, and knowledge exchange that further strengthen the competitiveness of UI on the world stage. The UI Green Metric assessment framework takes into account a number of sustainability-related factors, such as:

i. Setting and Infrastructure (SI): Examining the university's dedication to environmentally friendly construction, transportation, and infrastructure.
ii. Energy and Climate Change (EC): Assessing efforts to reduce greenhouse gas emissions, energy efficiency, and the utilization of renewable energy sources.
iii. Waste Management: Examining initiatives to reduce waste, recycle, and employ ethical disposal methods.
iv. Evaluation of sustainable waste: Management and water conservation strategies.
v. Transportation: Assessing accessible and environmentally friendly transportation options.
vi. Education and Research: Recognizing initiatives to incorporate sustainability into educational initiatives and research endeavors. These standards offer a comprehensive assessment of a university's sustainability performance, going beyond operational procedures to take into account community involvement, research, and education.

Table 1 shows that there are 51 criteria and indicators in six key categories of the Green Metric. Each category has a total amount of impact and a number of points, which are assigned to each indicator in the category based on their importance. Six indications totaling 1500 points are found in the first category, titled "regulation and infrastructure," with a total score influence level of 15%. Ten indicators make up the energy and climate change category, which is the most significant of all assessments with a total score of 2100 and a level of influence of 21%. With a combined total of 1800 points, the categories of trash, transportation, education, and research are each assigned an 18 percent weighting. Each of these indicators is given the following numbers: 6, 8, and 11. In addition to 1000 points, the water category also had a total influence level of 10%, making it the least effective of the six categories. The water category consisted of five indicators.

Table 1. University of Indonesia Green Metric World University rankings system categorization and indicators

Categories	No.	Criteria and Indicator	Points
Setting and Infrastructure (15%)	SI 1	Ration open space to the total area	200
	SI 2	Total area on campus covered in forest vegetation	100
	SI 3	Total area on campus covered in planted vegetation	200
	SI 4	Total Area for water absorption besides the forest and planted	100
	SI 5	Total open space area divided by total campus population	200
	SI 6	Percentage of university budget for sustainability within a year	200
	SI 7	Percentage of operation and maintenance activities of building in one year period	100
	SI 8	Campus facilities for disabled, special needs, and/or maternity care	100
	SI 9	Security and safety facilities	100
	SI 10	Health infrastructure facilities for students, academics, and administrative staff's wellbeing	100
	SI 11	Conservation: plant (flora), animal (fauna), and wildlife, genetic resources for food and agriculture secured in either medium or long-term conservation facilities	100
		TOTAL	**1500**
Energy and Climate Change (21%)	EC 1	Energy efficient appliances usage	200
	EC 2	Smart building implementation	300
	EC 3	Renewable energy sources	300
	EC 4	Total electricity usage divided by total campus' population (kWh/person)	300
	EC 5	Ration of renewable energy production divided by total energy use/year	200
	EC 6	Elements of green building implementation as reflected in all construction and renovation policies	200
	EC 7	Greenhouse gas emission reduction program	200
	EC 8	Total carbon footprint divided by total campus population	200
	EC 9	Number of the innovative program(s) in energy and climate change	100
	EC 10	Impactful university program(s) on climate change	100
		TOTAL	**2100**
Waste (18%)	WS 1	Recycling Program	300
	WS 2	Program to reduce paper, plastic	300
	WS 3	Organic waste treatment	300
	WS 4	Inorganic waste treatment	300
	WS 5	Toxic waste treatment	300
	WS 6	Sewage Disposal	300
		TOTAL	**1800**
Water (10%)	WR 1	Water conservation programs & implementation	200
	WR 2	Water recycling program implementation	200
	WR 3	Water efficient appliance usage	200
	WR 4	Treated water consumption	200
	WR 5	Water pollution control in the campus area	200
		TOTAL	**1000**
Transportation (18%)	TR 1	The total number of vehicles (cars and motorcycles) divided by the total campus' population	200
	TR 2	Shuttle services	300
	TR 3	Zero-Emission Vehicles (ZEV) policy on campus	200
	TR 4	The total number of Zero-Emission Vehicles (ZEV) divided by the total campus population	200
	TR 5	The ratio of the ground parking area to the total campus' area	200
	TR 6	Program to limit or decrease the parking area on campus for the last 3 years (from 2020 to 2023)	200
	TR 7	Number of initiatives to decrease private vehicles on campus	200
	TR 8	The pedestrian path on campus	300
		TOTAL	**1800**
Education and Research (18%)	ED 1	Ratio of sustainability courses to total courses/subject	300
	ED 2	Ratio of sustainability research funding to total research funding	200
	ED 3	Number of scholarly publications on sustainability	200
	ED 4	Number of events related to sustainability	200
	ED 5	Number of student organizations related to sustainability	200
	ED 6	University-run sustainability website	200
	ED 7	Sustainability report	100
	ED 8	Number of cultural activities on campus	100
	ED 9	Number of university program(s) to improve teaching and learning	100
	ED 10	Number of sustainability community services projects organized and/or involving students	100
	ED 11	Number of sustainability-related startups	100
		TOTAL	**1800**

The SDGs and the larger global agenda are aligned by the University of Indonesia's Green Metric World Ranking, an innovative assessment tool. These SDGs, which were endorsed by the UN in 2015, offer a thorough framework for solving the most urgent environmental, economic, and social concerns facing the globe. Through its categories and indicators, which emphasize the three key components of sustainable development—environmental, economic, and social factors—the Green Metric rating system demonstrates congruence with the SDGs. The synergies between Green Metric and SDGs categories are highlighted in a thorough analysis presented in Table 2, demonstrating how the ranking system helps advance the global sustainability agenda.

In order to improve sustainability knowledge, strategic

planning, and operations, as well as to foster cross-sector dialogue about sustainability on campus and stimulate collaboration between HEIs, the Green Metric offers a tool for examining all aspects of university campuses, including education, research, campus operations, outreach, assessment, and reporting. Figure 2 demonstrates the flexibility of the Green Metric criterion and diversity indicator dimensions.

Table 2. Suitable indicator UI Green Metric with SDGs

UI Green Metric World University Rankings Categories	Suitable SDGs Goals to UI Green Metric
Setting and Infrastructure	Goal 3: Good health and well-being Goal 4: Quality education Goal 13: Climate action Goal 15: Life on land
Energy and Climate Change	Goal 7: Affordable and clean energy Goal 9: Industry, innovation and infrastructure Goal 13: Climate change
Waste	Goal 6: Clean water and sanitation Goal 9: Industry, innovation and infrastructure Goal 11: Sustainable cities and communities Goal 12: Responsible consumption and production
Water	Goal 6: Clean water and sanitation Goal 12: Responsible consumption and production Goal 14: Life below water Goal 15: Life on land
Transportation	Goal 3: Good health and well-being Goal 10: Reduces inequalities Goal 11: Sustainable cities and communities Goal 13: Climate action Goal 15: Life on land
Education and Research	Goal 4: Quality education

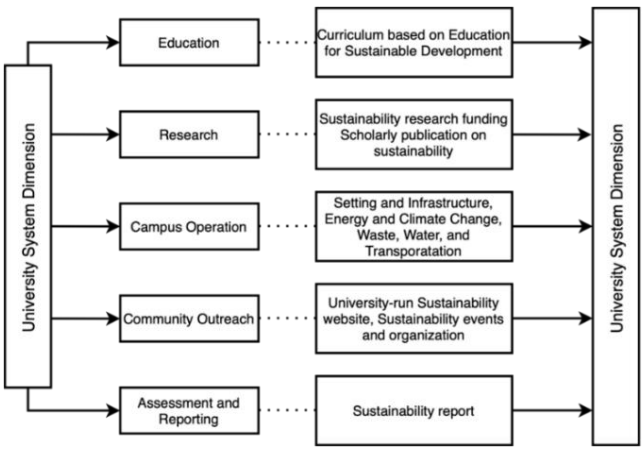

Figure 2. Conformity UI Green Metric and indicator with dimension for university

Through placing a strong emphasis on sustainability across all of its evaluation areas, the Green Metric rating system demonstrates its compatibility with the SDGs, this connection emphasizes the ranking's dedication to tackling global issues and promoting a sustainable culture throughout higher education institutions [27]. The Green Metric rating actively supports the larger global effort to accomplish the SDGs by 2030 by pushing universities to prioritize sustainability in their infrastructure, operations, and instructional activities [28]. Green Metric categories are crucial for furthering the global sustainability agenda through higher education in addition to being in line with the SDGs. International acclaim for the UI Green Metric World Ranking as a preeminent assessment instrument for gauging sustainability in higher education. This is shown in Figure 3, where the number of universities and countries participating in Green Metric during 2010-2021. Participation in the ranking by universities from all around the world demonstrates their dedication to sustainability and their efforts to address environmental problems. High rankings in the UI Green Metric improve universities' standing and competitiveness internationally. By establishing universities as pioneers in sustainability teaching and research, universities draw top talent, philanthropic support, and collaborative relationships.

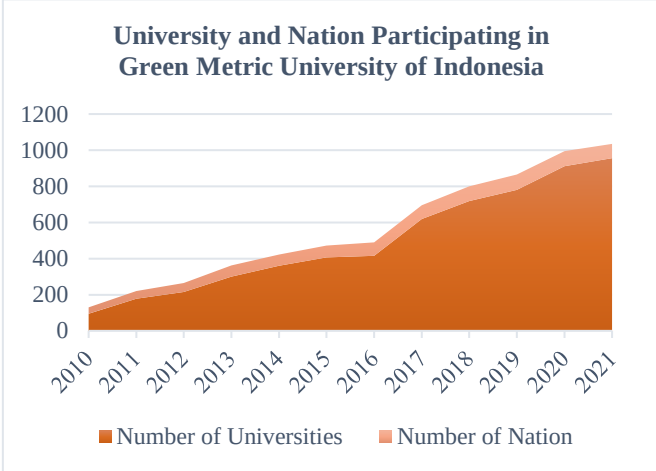

Figure 3. Number of universities and nations participating in the Green Metric during 2010-2022

Table 3 displays the findings from a study of the sustainability reports submitted by the participating universities. Sustainable actions taken by universities include cutting carbon emissions, installing charging stations for electric vehicles and bicycles, recycling, maintaining sustainable buildings, mowing grass for biodiversity, producing energy from renewable sources, creating natural parks, and promoting a healthy and environmentally friendly campus environment.

Unsurprisingly, the Green Metric UI has had an effect on rankings of universities worldwide. This ground-breaking metric has emerged as a significant catalyst for transformation within the realm of higher education. Its impact is not confined to the University of Indonesia campus; rather, it transcends national boundaries and motivates universities across the globe to adopt sustainability as a fundamental principle. With its comprehensive assessment framework, the Green Metric UI has incentivized academic institutions to systematically evaluate their environmental, economic, and social impact. Its assessment of academic initiatives, energy consumption, campus infrastructure, and refuse management, among other sustainability indicators, has compelled institutions to reconsider their sustainability strategies. Universities have been incentivized by the metric to harmonize their mission statements with sustainability objectives, resulting in a significant cultural transformation towards ecological accountability and ethical consciousness. Universities that achieve exceptional performance in these sustainability

assessments are bestowed with global acclaim and bolstered standing. Consequently, such acknowledgment garners the interest of exceptional personnel, financial support for research, and beneficial collaborations. In addition to scholastic accomplishments, universities are presently assessed on the basis of their contributions towards the promotion of sustainability. In addition, universities have been encouraged to collaborate and share knowledge as a result of the Green Metric UI.

Table 3. Sustainability action in Green Metric UI

University	Action for Sustainability	References
Wageningen University and Research	Reducing carbon emissions; installing charging stations for electric vehicles and e-bikes; sorting garbage (more than 15 waste flows); constructing and operating sustainably; providing sustainably; catering sustainably; mowing for biodiversity; producing renewable energy; launching environmentally conscious businesses; creating a green and healthy campus; and so on.	[29]
Nottingham University	A total of roughly 40% of the university's carbon emissions are expected to be cut between 2010 and 2020. The institution lays forth a plan to reach zero net carbon emissions as soon as possible, hopefully by the year 2040.	[30]
Groningen University	The institution plans to reduce its carbon footprint by 30% by 2026 (compared to 2019) and become carbon neutral by 2035, according to its sustainability strategy. Applying a sustainable human resources policy, aim to create a dynamic and energetic organization that actively promotes sustainable behavior among its employees and students.	[31]
Nottingham Trent University	Energy consumption (14% of NTU's emissions outputs) is being addressed, but the institution is also looking at other sources of emissions, such as the supply chain, travel, and remote work. Between now and 2025, Nottingham Trent University wants to cut its carbon output by 24 percent, and between then and 2030, university cut it by 50 percent.	[32]
University of California, Davis	Over 60% of UC Davis's academic departments offer sustainability-related courses, making it one of the most comprehensive sustainability curricula in the country. The university has decreased its greenhouse gas emissions below their levels in 2000 and is striving toward carbon neutrality by the year 2025 according to its Climate Action Plan.	[33]

3.5.1 Recognition of sustainable practices

An important factor in determining how faculty, staff, and the general public view and recognise an institution's commitment to sustainability is how sustainable activities are recognized inside the university. Faculty and staff at a university's opinion of sustainable practices depends on their knowledge of and familiarity with sustainability programs, policies, and practices. The dedication of the institution to sustainability may be better understood by faculty and employees who are actively participating in sustainability-related activities, such as research, teaching, or administrative tasks. Additionally, might be essential in promoting sustainable practices both inside their departments and in the larger university community. Moreover public perception describes how members of the general public, including students, alumni, locals, and outside stakeholders, feel about a university's sustainability initiatives [34]. The reputation of the organization and its appeal to potential contributors, students, and business partners can both be improved by a favourable perception. Public perception can be influenced by effective outreach, events, and media coverage of sustainability projects.

Recognition is greatly aided through sustainability networks, which include alliances, consortia, and collaborations with other institutions, organizations, and government agencies. University members may showcase their sustainability successes, cooperate together on initiatives, and gain knowledge from their peers through these networks. Universities can raise awareness about their sustainable initiatives on a local, national, and worldwide scale by taking part in such networks. Universities are able to share best practices, learn from one another, and enhance their sustainability efforts through participation in such networks. Collective projects and activities undertaken through sustainability networks tend to have a greater impact than those undertaken separately. Universities may tackle difficult sustainability issues and be recognized for their contributions to larger sustainability goals if work with other institutions. Sustainability issues can be addressed by amplifying the voices of universities and their endeavors in lunette.

3.5.2 Higher education through UI Green Metric

Integrating green metrics into the fabric of higher education is causing a seismic shift in the field. Strategic planning in higher education now routinely incorporates green measures. Sustainability is becoming a central tenet of university philosophies, curricula, and operating procedures. This shift is a paradigm change toward solving environmental, economic, and societal problems via learning, investigation, and policymaking. For example, according to research from Meikle and Morris [35], colleges throughout the world have undergone significant changes in response to the pressing concerns of our day. The institution's commitment to sustainability as a central tenet of its mission is emblematic of this shift, sustainability has risen to prominence in university mission statements, where it serves as an overarching theme for all activities, from curriculum development to day-to-day operations. This shift in thinking represents a firm will to take on difficult ecological, economic, and social problems, via means of instruction, investigation, and policymaking. These institutions have been in the forefront of fostering a campus culture of sustainability by providing students with sustainability-focused academic programs that equip them to take on global challenges and by implementing green campus activities that lessen their ecological impact. At the same time, there has been a shift in the way professors teach, do research, and work together to apply their knowledge to problems of sustainability [36].

In the areas of environmental science, renewable energy, climate change mitigation, and sustainability studies, universities with a strong commitment to sustainability tend to perform exceptionally well in academic research. This dedication encourages creative thinking, draws in the best minds in the field, and ultimately produces game-changing findings. Studies that aim to improve understanding of how to

achieve sustainability also provide solutions to some of the world's most pressing problems. When professors work together across departments, can be better able to attract research funding and build the university's reputation as a centre of innovative study. Next, incorporation of sustainability into curriculum design introduces novel ideas and methods.

The educational experience of students is improved when student participate in sustainability efforts to learn useful skills, gain leadership experience, and feel empowered. Institutional Prestige and Global Recognition, Institutional prestige can be boosted as well as student enrolment at universities that make sustainability a top priority. The UI Green Metric World Ranking, among others, helps to solidify the university's position as a pioneer in the field of sustainability studies. The academic excellence of the university benefits from this distinction by attracting top-tier staff, students, and research funds. One thing that can be proven is from journals published by various universities related to "sustainability". Figure 4, shows various universities in Indonesia that have published journals related to "sustainability". Institutions of higher education committed to sustainability recognize their role in addressing urgent global issues such as climate change, depletion of natural resources, and social inequality. Universities acknowledge their obligation to produce graduates who can contribute to the development of sustainable solutions.

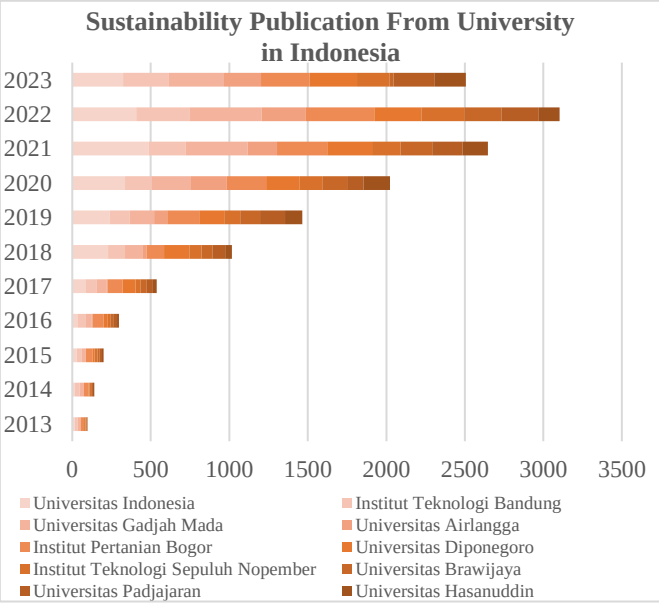

Figure 4. Sustainability topic publication from university in Indonesia

Within the realm of international higher education, sustainability has emerged as a formidable force, impacting not only the values and principles of universities but also their reputation on a global scale. Central to this paradigm shift resides the Green Metric UI, an efficacious instrument designed to assess and quantify the dedication of universities to sustainability. University rankings are profoundly and extensively influenced by the Green Metric UI. In the pursuit of achieving global recognition and sustainable practices, universities across the globe have turned to this metric as a compass through the intricate landscape of societal engagement and environmental responsibility. With excellence being of the utmost importance and competition being intense in the realm of global rankings, the Green Metric UI functions as a distinctive feature. Academia that achieves excellence in this particular metric not only acquires a sense of honor but also improves standing. By securing partnerships, research funding, and exceptional personnel, universities strengthen their standing as frontrunners in sustainability education and research. As one progresses towards a more sustainable global environment, the Green Metric UI serves as evidence of the significant influence that sustainability-based metrics can exert on the realm of higher education.

4. CONCLUSION

The emergence of green metrics as a catalyst for change has compelled colleges to make sustainability a central focus of their institutional mission, pedagogy, and administration. The widespread acceptance of green metrics shows a cultural shift in which environmental, economic, and social sustainability are prioritized. In response, many educational institutions have taken on the role of change agents by tackling pressing international issues and encouraging a sustainable mindset in their student bodies, professors, and staff. The dynamic correlation between sustainability initiatives and global university rankings has been elucidated through the novel methodology of this study, which combines qualitative insights from a wide range of stakeholders with quantitative analysis of green metric data. An upward trend in global rankings is more probable for institutions that demonstrate a complete dedication to sustainability, as evidenced by their performance in green metrics. This cultural transformation stimulates increased participation from both students and faculty, drives advancements in the creation of innovative curricula, and accelerates endeavors to tackle urgent global issues. Concurrently, this establishes universities as pioneers in sustainability research and education, thereby making a substantial contribution to the worldwide sustainability agenda. The voyage from sustainability to superiority is not merely an academic endeavor, but rather a profound commitment to addressing the complex challenges facing humanity in the twenty-first century. It emphasizes the interconnectedness of environmental and social issues and the crucial role of higher education institutions in shaping a more sustainable future. As we navigate an era characterized by environmental crises, economic uncertainty, and social inequalities, the incorporation of sustainability into global university rankings demonstrates the importance of education in cultivating a sense of responsibility, ethical values, and innovative solutions. It reaffirms that sustainability is not a choice but a necessity, and it urges universities around the globe to continue their journey toward a more sustainable, equitable, and prosperous future for all. Within the realm of international higher education, sustainability has emerged as a formidable force, impacting not only the values and principles of universities but also their reputation on a global scale.

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