



Contextual Role of Woman Board on Sustainability Practice: Evidence from Indonesian University

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ABSTRACT:

This research seeks to explore good practices of sustainability in higher education. 30 Indonesian HEIs are participating in UI Green Metric, selected as research objects because they have represented real sustainability actions in higher education. There are 1147 universities in 95 countries in 2024 as participants in UI Green Metric. Content analysis was conducted to identify and present research data. Data sources were obtained from university websites by targeting important documents such as university strategic plans. Artificial intelligence tools like Perplexity supported content searches with sustainability, green, and environmentally friendly keywords. This research found that most HEIs formed SDG centre units at the institutional level as formal evidence of sustainability commitment. Green campus designs with green space, buildings, and behaviour were also developed to implement sustainability actions. In educational activities and curriculum, several HEIs have sustainably packaged their curriculum with several strategies, such as creating new sustainability courses. The development of this sustainability course is supported by the Masudem international program in the form of a consortium of ASEAN countries (6 countries, 3 of which are from Indonesia) and Europe (6 countries). Furthermore, community service activities are realized through tree planting and community assistance with a green theme. The findings of this research increase and complement the literature that good practices of sustainability in higher education are not just concepts but have been implemented concretely. The results of this study are expected to motivate other higher education institutions, especially private universities, to participate institutionally in sustainability actions to achieve the SDGs target by 2030.

Keywords: SDGs centre, Masudem, Green Campus, UI Green Metric.

JEL Codes: M14, M41, M42

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1. INTRODUCTION

Higher education institutions (HEIs) have a key role in sustainability. HEIs are key agents in educating future leaders who will contribute to achieving the Sustainable Development Goals (SDGs) (Tomasella et al., 2023). HEIs contribute greatly to creating a mindset that facilitates the socialization of SDG principles (Filho et al., 2019). Many HEIs have responded to current challenges by making sustainability an important dimension of the university, reflected in its vision and mission, curriculum, research and operations, outreach and community service, and academic staff development.

As an agent of transformation, higher education has a tremendous impact in bringing about the necessary changes in education. Sustainability principles are at the heart of higher education institutions' strategies (e.g., strategic plans, curricula, courses) and are key to embedding them into the organizational culture. Only by leading by example will externally influence in society be possible (e.g. implementing key aspects of the SDGs such as gender equality and reducing waste and energy consumption). Educational institutions can play a role as a bridge between different stakeholder groups. Higher education institutions have a unique responsibility to shape future professionals and to apply knowledge and ideas of excellence.

HEIs have considered sustainability as part of the responsibility of higher education since 1970 (Žalėnienė & Pereira, 2021). This role was further strengthened in 2005-2014 since the UN declared the importance of educational institutions in implementing world sustainability. This declaration succeeded in increasing the focus of HEIs on educational management that adopted sustainability efforts (Žalėnienė & Pereira, 2021). The year 1990 (Talloires Declaration) also increased the number of HEIs adopting sustainability strategies. Other declarations also followed it in various countries such as Japan with the Kyoto Declaration, Europe with the Copernicus Declaration, Canada with the Halifax Declaration (Corcoran et al., 2002), and Asian countries such as Hong Kong (Filho et al., 2019).

Although many HEIs implement sustainability practices, there is no uniformity in how sustainability principles are integrated into *education for sustainable development* (ESD). HEIs with different geographical regions have different sustainability initiatives and practices. Different sustainability initiatives and practices were found between developed countries (e.g., Europe) and other countries (Bizerril et al., 2018). Furthermore, the highest ESD practices are still concentrated in developed countries (western countries), even though this sustainability vision should be adopted globally (Žalėnienė & Pereira, 2021).

Scientific research on ESD is still lacking. Therefore, gaps in the literature still need to be addressed (Lim et al., 2022), especially regarding the implementation or integration of ESD in HEIs (Mondragon et al., 2023). This is due to the lack of sustainability practices in HEIs. Vale et al. (2022) reported that sustainability practices in HEIs are still in their early stages and very heterogeneous, as evidenced by only 24 articles published on the Web of Science discussing sustainability themes until 2022. Stakeholder and legitimacy theories are commonly used to express sustainability in HEIs. Therefore, the call for the importance of sustainability is expected to increase HEIs' awareness of this issue.

Sustainability issues are challenges that are not widely observed in the available literature, especially in developing countries (e.g., Indonesia). It is still unclear how HEIs in various countries and Indonesia integrate ESD. This research attempts to address the literature gap by reviewing the integration of ESD in higher education institutions in Indonesia and its relevance in achieving the SDGs, especially by female directors. A series of strategic plans and their

operationalization in *tridharma* higher education activities such as curriculum, research and development, and community service in HEIs in Indonesia are analyzed to understand the types of information related to sustainability. This study also highlights the role of gender in the effectiveness and acceleration of ESD implementation in Indonesian higher education institutions.

The current political, economic, and social scenario requires HEIs to face significant changes, which requires the definition of strategies and policies strongly oriented towards sustainable development, which are fundamental for long-term competitiveness and success. Women's leadership plays a key role in this perspective. Women have demonstrated the ability to manage various challenges successfully. However, little empirical evidence exists on how women contribute to sustainable development, especially in HEIs. Research on women's roles in sustainability is frequently carried out in corporate settings. For example, several studies have elucidated women's special role as custodians of natural resources (Shinbrot et al., 2019). Women are essential in advancing a strategy that emphasizes sustainability. Women have proven their worth and capacity to handle difficulties by shifting social norms and environmental conditions over time. According to a study by Galletta et al. (2022), in the banking sector, having more female directors enhances both financial and environmental performance since they are more aware of the demands of stakeholders and the social component than male directors.

The paper addresses this gap by developing a content analysis study based on information or documents from university websites, such as the university strategic plan (SP). We used artificial intelligence tools like Perplexity to support content searches with sustainability, sustainability, green, and environmentally friendly keywords. Thus, the study examines how female leadership supports the HEI's shift to sustainability.

2. THEORETICAL FOUNDATION

2.1. Sustainable Development Goals on Education for Sustainable Development

One of the most important ways HEIs contribute to the SDGs is by providing *Education for Sustainability Development* (ESD) (Mondragon et al., 2023). The role of HEIs in promoting humanism, knowledge, enlightenment, and societal well-being is crucial, and as such, they have historically changed societies for the better. Furthermore, none of the SDGs can be fully achieved without the contribution of academics (Mondragon et al., 2023).

HEIs play a key role in providing education for sustainability: study and research centres can enhance sustainability through projects that combine disciplines. Different practices among educators increase diverse and broad opinions. HEIs are responsible for cultivating sustainability practices to shape the next generation of professionals.

The mission of higher education is not limited to producing knowledgeable students. HEIs are responsible for providing education for sustainable development (ESD). The SDGs themselves recognize the importance of creating knowledge, skills, and mindsets that enable various sectors (including *students*) to achieve the SDGs (Mondragon et al., 2023).

In principle, education for sustainable development (ESD) integrates sustainable development messages throughout learning to stimulate and equip *students* to make decisions that benefit sustainability (Kioupi & Voulvoulis, 2019; Trechsel et al., 2018). HEIs must prepare their graduates "to apply knowledge to solve unprecedented problems" (Kaputa et al., 2022). HEI graduates are part of the "energetic society" needed to ensure the implementation

of the SDGs (Filho et al., 2022), as UNESCO demands (Kioupi & Voulvoulis, 2019). In the process, HEIs also promote the creation of ideas, innovations, and technologies that are the basis for sustainability, although this role may sometimes be underestimated (Žalėnienė & Pereira, 2021). The impact of higher education in forming good character and morals that benefit society can generally only be enjoyed 50-60 years after graduation (Rose, 2013). This impact can continue for centuries.

However, there is still little research examining sustainability in HEIs. There is no uniformity in the level of implementation of sustainability issues and practices across HEIs, as is the case in Spain (Sánchez-Carracedo et al., 2021), Belgium (Stough et al., 2018), Australia (Sen et al., 2021), Asia Pacific countries (Ryan et al., 2010), Asian countries (Filho et al., 2022) and including *low-income countries*. (Cornet et al., 2024) such as Indonesia. In addition, the complexity of sustainability at the conceptual level is rather difficult to link to learning outcomes, and the goals to be achieved by ESD are still uncertain (Kioupi & Voulvoulis, 2019). Thus, the lack of academic consensus on sustainability at the best practice level requires HEIs to formulate a format and philosophy that can be adopted to contribute to the SDGs.

Integrating sustainable strategies into HEI governance challenges educational institutions' management today. These strategies can legitimize and develop sustainable competitive advantages (Miotto et al., 2020). This means that *sustainability* and accountability alone are not enough. HEIs need to reproduce legitimacy by placing them in the network of public discourse and communication (Kuruppu et al., 2019; Palazzo & Scherer, 2006).

Sustainability HEIs reflected in the strategic plan are key to ESD implementation and legitimacy. The suitability and efficacy of the strategy/policy are generally measured in several dimensions, such as ethics, accountability, transparency, stakeholder relationships, and engagement (Caeiro & Azeiteiro, 2020). Several literatures have been very extensive in examining the strategic role of HEIs in shaping sustainability. However, none have integrated how female directors can accelerate ESD implementation in HEIs. Implementing sustainability strategies is very important for HEI legitimacy, as it can increase access to key resources and ensure the sustainability and success of HEIs in Indonesia.

2.2. Woman's Leadership on Sustainability

The stakeholder theory suggests why female directors are more concerned and supportive of social and sustainability activities. First, female directors have psychological characteristics with dominant and sensitive feelings and emotions (e.g., sympathy, affection, helpfulness), so they are more communal than men. The communal nature of female directors can facilitate their better response to stakeholder claims and demands and encourage them to consider proactive strategies to respond to demands for sustainable business practices by prioritizing social and environmental responsibility (Eagly et al., 2003; Tourigny et al., 2017).

Women's emotional and psychological characteristics make female directors more sensitive to social interests (other people), have better relationships with stakeholders, and accept various stakeholder perspectives, making them more strongly oriented toward social, environmental, and sustainability practices (Ntim & Soobaroyen, 2013).

The communal character of women leads them to lead more collaboratively, participative, and democratically than men, who tend to be autocratic (Eagly et al., 2003). This is based on the character of women who tend to be more ethical and have higher moral standards than men

(Roxas & Stoneback, 2004; Sikula & Costa, 1994). Female managers are more moral than male managers in accounting firms (Flynn et al., 2015). This shows that female boards of commissioners are less tolerant of opportunistic, unethical behavior and can play a better role in supervision than male commissioners to increase the effectiveness of the overall role of commissioners (Al-Sarraf, 2023). Berinato (2021) stated that bank boards of commissioners with female structures tend to have fewer financial reporting errors and less fraud.

Thus, ethical character makes women more sensitive to CSR and environmental issues (Chang et al., 2024). For example, women's involvement in charity activities and handling environmental crises is absolute and cannot depend on men (Yamin, 2022). Female directors with unique psychological characters are assumed to be more able to realize social and environmental issues than men.

This is supported by a large amount of empirical literature that shows that female directors positively impact social and sustainability issues (Oino & Liu, 2022). The psychological characteristics of women who are more sensitive in responding to external pressures and claims encourage them to be more likely to care about promoting social practices (Issa & Fang, 2019; Oino & Liu, 2022; Zou et al., 2018) and sustainability. It can be understood that compared to men, female directors tend to make socially oriented decisions so that they try to accommodate stakeholder demands more effectively. The presence of female directors is thus expected to increase the effectiveness of stakeholder management (Pucheta-Martínez et al., 2018). However, only a few similar studies have been conducted in the context of developing countries.

Farinha et al. (2019) identified sustainability integration in Portuguese HEIs through the analysis of strategic plans and activities and sustainability reports. This research is claimed to be a role model for HEIs implementing sustainability. Furthermore, Kucharcikova et al. (2019) used indicators of scientific activity such as sustainability research, development, and innovation in HEIs in Spain. This study found that sustainability research is still insufficient; there is a gap between policy and results. Scientometric techniques were used to analyze journals (Web of Science). Caeiro and Azeiteiro (2020) assessed that many HEIs have not conducted sustainability performance assessments. This is determined by the vision and mission reflected in education and research, which until now have not focused on external demands, so more effort is needed in the future. Caeiro et al. (2020) further proposed a sustainability performance assessment instrument for HEIs in Portugal and Spain, namely the integration of participatory processes, non-traditional aspects of sustainability, and the external impact of HEIs on sustainability.

According to Pierli et al. (2022), female leaders support adopting and advancing social and environmental practices through several innate traits, including the capacity for emphasis and listening and a propensity for cooperation and sharing. Furthermore, the following key characteristics are present in sustainable women leaders: managing complexity, adopting an inclusive leadership style, and thinking methodically and holistically.

3. METHODS

This research aims to analyze how HEIs implement sustainability issues that can be traced from strategic plans and derived from their *tridharma* activities: teaching, research, and community service. Therefore, the content analysis method is used for the strategic plan (HEI

strategic plan) published on the website in 2024. The research sample is based on HEIs that meet the requirements: (1) publishing strategic plans on the web, (2) having a female leadership structure (chancellor and/or head of the management body).

Data collection. This research uses synchronic semantic content analysis, qualitative, and is based on text coding (Hsieh & Shannon, 2005; Kawamoto et al., 2023). Coding is an instrument that makes it easier for researchers to conduct content analysis (Krippendorff, 2019). The text is grouped into several quotes, and codes are applied to each. Each quote can be related to several codes, and the code is a tool for interpreting text, rational data, and statistical approaches (Krippendorff, 2019). CADQAS Atlas.ti software is applied to code content and manage large amounts of text data to find themes (Gupta, 2023; Khan et al., 2018; Vale et al., 2022).

This study was developed based on a qualitative content analysis that identified sustainability practices based on environmental, social, and economic dimensions (Amaya et al., 2021) contained in the strategic plan, then classified them based on three types of signals (Connelly et al., 2011). The content analysis codes were selected by considering the current theoretical framework related to HEI sustainability, which mainly focuses on the dimensions of governance, accountability, environmental, social, and economic, as well as the quality and impact of teaching and research.

Weber (1990) argued that content analysis's validity requires face and external validity. Face validity is an appropriate instrument to measure what should be measured. External validity ensures that conclusions on several samples are convincing and represent the entire population. Therefore, Vourvachis and Woodward (2015) suggest the need to consider the content of the content being examined, the classification used, and its quantification unit, such as the sampling unit. Data validity is maintained in this study with a saturated sample of all population members.

4. RESULTS AND DISCUSSION

Several universities in Indonesia have adopted sustainability programs focusing on social and environmental responsibility. These universities are committed to reducing environmental impact and educating future generations about the importance of sustainability and social responsibility. Indonesia University started as a campus that implemented a sustainability program in 2010. Indonesia University's sustainability initiatives gained recognition and world rankings that year.

2010, Indonesia University initiated the "UI Green Metric World University Rankings". UI Green Metric is the first and only world university ranking in sustainability. The UI Green Metric ranking assesses universities' sustainability efforts and commitments worldwide to environmental practices by assessing HEI sustainability policies and programs through an online survey. 95 universities from 35 countries participated in Green Metric 2010, with details of 40 from Asia, 2 from Australia, 35 from Europe, and 18 from the Americas. With this ranking, HEIs are assessed based on their efforts in university partnerships to improve campus sustainability.

The ranking evaluates universities using a series of indicators grouped into six criteria: land use and infrastructure (15%), which focuses on managing university buildings and their surrounding areas to promote a green environment. Second, energy and climate change (21%), assessing the university's energy use, alternative energy sources, and climate change initiatives.

Third, waste management (18%), evaluating how the university handles waste and recycling efforts. Fourth, water management (10%): looking at programs to reduce water consumption. Fifth, transportation (18%): considering initiatives to promote environmentally friendly transportation options. Sixth, education and research (18%): measuring the university's role in fostering a green generation through education and research activities.

UI Green Metric is vital in promoting universities as agents of social change related to sustainable goals. Here are some ways UI Green Metric contributes to measuring green campus performance: UI Green Metric assesses universities based on their commitment and actions towards greening and environmental sustainability. This helps universities understand their performance in terms of sustainability and provides a basis for improvement.

Second, raising awareness: By promoting sustainable programs, UI Green Metric raises awareness in the university and beyond about the importance of sustainability issues. This can trigger changes in behaviour and practices at the university. Third, building networks: UI Green Metric helps build networks between universities participating in the program. This network allows universities to share best practices in running sustainable programs and build partnerships with partners worldwide.

Fourth, encouraging action: By setting voluntary standards and providing rankings based on sustainability indicators, UI Green Metric encourages universities to take real action in improving infrastructure and actions towards sustainable universities. Fifth, promoting social change agents: UI Green Metric directly promotes universities as agents of social change, focusing on sustainable goals. This includes environmental, economic, and social aspects, as well as strengthening the role of universities in fostering a green generation through education and research. Based on the UI Green Metric ranking in 2023 with assessment indicators such as waste management, water management and education, there are the Top 30 HEIs according to UI Green Metric:

Table 1. Top 30 HEIs according to UI Green Metric (<https://GreenMetric.ui.ac.id/ratings/trees-rating-2023>)

No	University	No	University
1	University of Indonesia	16	Yogyakarta State University
2	Diponegoro University	17	Sultan Ageng Tirtayasa University
3	University of Gadjah Mada	18	Muhammadiyah University of Yogyakarta
4	IPB University	19	Sriwijaya University
5	Semarang State University	20	University of Brawijaya
6	March Eleventh University	21	Teuku Umar University
7	Sepuluh Nopember Institute of Technology	22	Multimedia Nusantara University
8	Airlangga University	23	University of Medan Area
9	Raden Intan State Islamic University of Lampung	24	Muhammadiyah University of Malang
10	Padjajaran University	25	University of Northern Sumatra
11	Telkom University	26	Surabaya State University
12	University of Lampung	27	Sultan Thaha Saifuddin State Islamic University of Jambi
13	Hasanuddin University	28	Malang State University
14	Sumatra Institute of Technology	29	Syiah Kuala University
15	Islamic University of Indonesia	30	Budi Luhur University

This research was based on data collected through content analysis of university websites and institutional documents such as the University Strategic Planning, University Research, and Community Service Strategic Planning. It found 74 Strategic Plans from 41 state universities (55%) and 33 private universities (45%).

This research also maps the gender of 81 university leaders (chancellors/chairpersons) consisting of 57 men (70%) and 24 women (30%). Based on this composition, the number of male leaders is more dominant than female leaders. The number of female leaders is only 1/3 of all universities in Indonesia. The number of leaders (chancellors and vice-chancellors) and faculty deans from 81 universities shows that 475 are men (79%) and 130 are women (21%). The research revealed that the involvement of women in HEi leadership roles is notably limited, a situation attributed to various obstacles. The lack of women in senior management roles can be largely explained by the fact that there are considerably fewer women than men in academic or administrative positions.

Similarly, Alshdiefat et al. (2024) reported there were no female appointments at the Vice President and Dean levels in public universities of Jordania, positions that are filled based on the recommendations of the President. In private universities, only five women occupied the role of Vice President, in contrast to 39 men. These include sociocultural constraints, prevailing gender stereotypes, insufficient skills and opportunities, conflicts between work and personal life, challenges within social networks, inadequate mentoring and support, as well as ineffective institutional policies that fail to promote women's advancement.

Four campuses have sustainability initiatives and programs based on the strategic plan. Indonesia University has been committed to sustainability since 2010. Sustainability efforts are reflected in various policies and programs, such as waste management and reduction and renewable energy use initiatives. UI is involved in projects that support sustainable development at the local and national levels.

Gadjah Mada University (UGM) supports sustainability through various programs, including research and community service focusing on environmental issues. UGM actively collaborates with various partners to implement sustainability practices on campus. Bandung Institute of Technology (ITB) realizes sustainability programs through various initiatives by developing environmentally friendly technologies and research related to renewable energy. ITB also integrates sustainability education into the curriculum.

In addition, ITB is collaborating with GEM, which funded the construction of the laboratory and its various facilities with a total of 15 million USD. It has also built a robot statue that uses entirely recycled materials. The statue named "Green Hercules" is 6.9 meters high, has a base diameter of 3.9 meters, and weighs 7.8 tons, which took one month to complete. The statue is made from over 600 parts of used cars and scrap metal, the materials of which were collected and made in Morowali, Central Sulawesi. Making the statue from recycled materials is equivalent to reducing CO2 emissions by 11.25 tons if made with new materials. The materials used to make it are selected from the best and will be regularly maintained. GEM Joint Laboratory General Secretary said that:

"The concept of Green Hercules was inspired by the film The Wandering Earth. This statue stands upright, carrying the earth on its left shoulder, holding garbage in its right hand, and looking up at the starry sky, the meaning of which is to awaken humanity to protect the earth by mining urban mining and developing new energy. The meaning of the word Hercules is the guardian and development of green energy on earth."
(<https://itb.ac.id/berita/patung-robot-daur-ulang-simbol-keberlanjutan-di-itb-kampus-jatinangor/61101>)

Diponegoro University (Undip) implements its sustainability program by focusing on research that supports environmental conservation and natural resource management. Undip also actively holds seminars and workshops to raise awareness of sustainability issues. Hasanuddin University (Unhas) is involved in various sustainability initiatives, including environmental management programs and climate change research. Unhas seeks to involve students in activities that support sustainability.

The focus of green campus implementation from various universities is implemented in various programs listed in each University's Strategic Plan. With various programs owned, such as the University of Indonesia, it has again become the best green campus in Indonesia, according to the UI Green Metric ranking. UI excels in all UI Green Metric indicators: waste management, water management, and education. On an international scale, UI managed to rank 27th in the 2018 Green Metric ranking. Then, Pad Jajaran University pays attention to the environment by implementing a green campus with a smoke-free campus red. It uses bottled drinking water by providing tumblers and refillable water for its academic community and reducing electricity consumption using environmentally friendly and energy-efficient building designs. Campus transportation will later be developed using electric cars; educational facilities and infrastructure are optimised through resource sharing using e-rooster. The green campus will be realized on the Jatinangor campus with attributes such as green buildings, green space, and green behaviour, and green energy still needs to be realized. Meanwhile, universities like UGM realize a healthy, safe, environmentally friendly, cultured, and socially responsible campus. Adaptation of the concept of sustainability in higher education opens up opportunities for developing and implementing the concept of an environmentally friendly campus supported by various programs, such as zero-waste, recycling, reuse, use of renewable energy, and the habituation of environmentally friendly behaviour. The IPB University program has initiated the Green Campus since 2015, with elements such as green transportation, green movement, green buildings, green energy, and green space. The IPB campus environment is hoped to become a green campus by 2020 gradually. The purpose of this program is to develop environmentally aware academic community behaviour, realize an environmentally friendly IPB campus: zero waste, zero-emission, rich in bio- and cultural diversity, and create a safe, comfortable and conducive campus condition for a successful learning system, and support the agro, eco, edutainment tourism program. The direction of IT development of UIN Raden Intan Lampung in the future encourages synergy and integration with the vision of a "green campus" by (a) measurably reducing paper usage, digital administration (office automation), and digital learning. (b) Developing environmentally friendly IT characterized by a lower carbon footprint for computing facilities, Energy and Environmental management, smart building, environment monitoring, green culture development, KPI management on green programs, and promoting green culture. (c) Integrating the direction of IT policy with the direction of green campus policy can be seen through the use of devices that pay attention to environmental issues, ensuring the use of devices with the most efficient energy consumption, implementing gradual energy consumption measurements and using the concept of continuous improvement. (d) Developing renewable energy sources (solar cells, wind power) gradually.

The focus of the sustainability program implemented at the University of Indonesia seeks to contribute ideas and real work, including overcoming global problems that are the focus of sustainable development (Sustainable Development Goals). On the other hand, the UI General Policy states that globalization and technological advances have made competition

between universities increasingly tight. The innovation built by Brawijaya University, in particular, is “innovation for solving community problems and sustainability. UB formulates values to maintain sustainability and new changes that are easy and accepted by the community. This innovation is marked by various indications, such as the formation of the Center for Excellence in Science and Technology (PUI) and Science Techno Park (STP), increasing the ratio of UB’s PNBP income from collaboration and research downstream, increasing the ratio of research with international collaboration and increasing citations. Padjadjaran University must also be at the forefront of its participation in providing solutions to sustainable development problems through networking built by the Unpad SDGs Center and other relevant Centers of Excellence. The West Java Institute will be established to provide services in the form of solutions to problems and policy recommendations to accelerate the progress of West Java. In terms of community service, the community will implement research and study results to support the independence of PTN-BH Unpad. Strategic partnerships with local governments have been built through mutually beneficial programs. UGM is committed to fighting for harmony and balance between humans and nature for future sustainability through an ecocentric framework (deep ecology). The demands of change in higher education require UGM to make internal changes to the strategy and implementation of *Tridharma* as its main business. UGM is committed to supporting transformative education, research, and community service that promotes and strives for social change based on social justice, equality, inclusivity, and sustainability in all *Tridharma* activities. IPB University’s concept in the development of Agro-Maritime 4.0 views land, sea and air as a whole that involves complex social, economic and ecological systems, thus requiring a trans-disciplinary, integrated and participatory approach. Agro-Maritime 4.0 is built on inclusivity, transparency, environmental friendliness, creativity, critical thinking and ethics. Agro-maritime development aims to create sustainability, prosperity, justice and sovereignty for the Indonesian nation. Industrial Revolution 4.0. At the operational level of Airlangga University, the five strategic initiatives are described in five development program themes. The five program themes are: (1) Sustainable Education for All; (2) Meaningful Research and Community Development; (3) Advancing Innovation, Enterprising and Industry Linkages; (4) Responsive and Lean Management; and (5) Topping up Tangible and Intangible Resource Utilization. Sustainability programs are proven by the presence of practitioners who teach at UNAIR, staff and global mobility programs, and the implementation of various types of KKN that have an impact on the community and are very relevant to the “Merdeka Belajar Kampus Merdeka-MBKM” (independent learning independent campus) program from the Ministry of Education and Culture.

This research found several main themes based on the implementation of sustainability in the main campus programs and its integration into the *tri dharma* of higher education. Indonesia University has pioneered the implementation of sustainability in higher education in Indonesia. In fact, in 2010, UI launched the UI Green Metric instrument as a ranking of campus environmental management. This instrument measures and evaluates campus efforts in creating sustainable and environmentally friendly higher education.

At the institutional level, HEIs generally form *SDG centre units*. This unit of excellence (knowledge centre) assists the government in preparing, implementing, monitoring, evaluating, and reporting the SDGs Action Plan. 51 SDG centers have been formed at universities in

Indonesia (Bappenas, 2024) until May 2024. Meanwhile, universities that participated in the UI Green Metric ranking were 9 out of 30 universities that facilitated the formation of SDGs centres: UI, Unpad, Unhas, UB, Undip, Untirta, UMM, Unila, and the Sumatra Institute of Technology. This shows the real commitment of universities by forming units or institutions that study and implement sustainability and environmental management activities in universities. Meanwhile, academics in Indonesia also have a forum called the SDGs Center Network to collaborate and network in implementing SDGs in a coordinated, broad, and efficient manner.

The Green Campus program is also a priority effort of HEI, which wants to realize its commitment to sustainability. Green Campus is HEI's effort to design environmentally friendly and energy-efficient buildings (electricity) by creating a smoke-free campus and reducing bottled drinking water (providing refillable water and tumbler facilities) for academicians. Unpad has carried the concept of green space, green building, and green behaviour by optimizing e-rooster-based infrastructure (*resource sharing*).

Several universities initiated and implemented the *green campus program*: the University of Indonesia, Brawijaya University, Unesa, State University of Malang, Padjadjaran University, IPB, UIN Raden Intan Lampung, and UGM. Meanwhile, Semarang State University and Sebelas Maret University declared themselves conservation campuses, and Undip and ITS developed green technology campuses. Several other HEIs are trying to implement greening programs in the campus environment, namely Sultan Ageng Tirtayasa University, Teuku Umar University, Medan Area University, and STS Jambi State Islamic University.

Tree planting activities in the campus environment are also part of the campus SDGs agenda. Brawijaya University did this by planting 100 ketapang trees. Teuku Umar University planted 1.000 trees in the student dormitory environment. UIN STS Jambi has a *Green Sutha program*, namely planting 1.550 trees, funded by a Jambi Ministry of Environment grant. Academic civility UIN STS Jambi said that:

"UIN STS Jambi is currently serious about responding to environmental issues and nature conservation," (the President of UIN STS Jambi).

"This program is a symbol of environmental maintenance efforts that can start from simple things such as sorting organic and inorganic waste. Sorted waste such as organic waste can be reused into environmentally friendly products" (Head of SDGs Center UIN STS Jambi) (<https://old.uinjambi.ac.id/uin-jambi-terima-bantuan-1550-bibit-pohon-gratis/>)

Another concrete action is the waste and garbage management program. Indonesia University manages waste through the Chancellor's Decree to manage waste and garbage, including waste containing B3 (hazardous and toxic materials). Universitas Negeri Semarang has taken important steps such as using renewable energy, reducing plastic waste, developing green areas, and providing environmental awareness education to academics, lecturers, students, and education staff. Universitas Negeri Lampung has a TPST (Integrated Waste Disposal Site) based on Reduce, Reuse, Re-cycle (3R) to improve sustainable waste management and reduce waste generation. Technology-based waste management was developed by the Sumatera Institute of Technology by building IWACI (Integrated Waste and Agro Center). This program includes thermal processing, bioconversion of organic solid waste, inorganic waste utilisation, liquid fertiliser production, biogas technology application, and independent animal feed. The waste bank program is also recognized as a concrete form of waste management implemented by Universitas Negeri Yogyakarta and Universitas Budi

Luhur. The concepts of reuse, recycling, and zero waste are the main attributes of waste and garbage management.

The University of Indonesia's mainstay is environmentally friendly transportation programs and policies, such as road facilities for pedestrians and cyclists on campus. Unpad is trying to develop electric cars on campus to reduce carbon emissions. Renewable energy and being used to environmentally friendly behaviour are the mainstay programs supporting green transportation.

Sustainability programs in higher education institutions must be embedded in the curriculum. Several HEIs are trying to integrate sustainability into the curriculum and education through several strategies. UII developed the Ulil Albab curriculum based on the concept of Rahmatan lil Alamin. The development of the Ulil Albab curriculum aims to produce many Ulil Albab who can contribute to sustainability covering four personalities: prophetic leadership, Islamic personality, integrative knowledge, and transformative skills. UGM, UII, Syiah Kuala University took the initiative to organize MASUDEM (Master in Sustainability Development and Management), a project to improve the postgraduate curriculum and develop sustainable development and management capacity. This project also aims to improve the capacity of teaching staff to deal with issues related to sustainable development and a green economy. The consortium involves six universities from ASEAN, including three from Indonesia (Gadjah Mada University, Islamic University of Indonesia, and Trisakti University) and three from Thailand (International College of NIDA, Srinakharinwirot University, and Naresuan University). European partners include the University of Economics in Bratislava, Slovakia; Mendel University Brno, Czech Republic; Pablo de Olavide University Seville, Spain; and Eötvös Loránd University, Hungary. Its activities include curriculum development, teaching staff capacity building, and internationalisation promotion through ongoing collaboration among the consortium members. Masudem seeks to disseminate best practices of sustainability integration into HEI curricula, as well as introduce collaborative projects between universities in Europe and Southeast Asia.

UGM and Unpad developed sustainability courses as concrete and primary evidence of sustainability integration in education. In addition, consistent and extensive socialization continues to be echoed by holding national and international conferences on sustainability.

KKN (Real Work Lecture) is a flagship program of universities in community service as implemented by UGM, UNY, UIN STS Jambi, and UM. UGM developed KKN-PPM (community service), which encourages students to be involved in participatory, empathetic, and interdisciplinary activities. UM designed thematic KKN, involving students in community service activities: Independent Prosperous Village, KB Village, Astra Prosperous Village, Tourism Village, Village Administration Modernization, and Empowerment of Islamic Boarding School Management.

Simply put, our findings prove that the presence of women on corporate boards positively influences sustainability performance, indicating that companies with female board members tend to achieve superior sustainability outcomes. Similarly, previous research suggests that organizations are more inclined to engage in corporate social responsibility initiatives when they have a higher representation of women on their boards (Noureldin & Basuony, 2022). Additionally, both the size of the board and its independence contribute to improved sustainability performance.

In contrast to previous studies, this research found that the implementation of sustainability is limited to teaching/research results and other activities, including community

service. Meanwhile, in the UK (England, Scotland, Wales, and Northern Ireland), the authors observed significant variability in the extent of voluntary disclosures among universities, noting an overall low level of Public Accountability and Transparency Index (PATI) at 44 per cent, especially concerning the reporting of teaching and research outcomes (Ntim et al., 2017).

5. CONCLUSION

The results of this research add to the literature on sustainability, especially in the scope of higher education, where there was no real action in previous studies, and it was only at the discourse (concept) level. This research successfully identified and explored the form of sustainability in higher education in three activities: institutional level, integration of sustainability in the curriculum, integration of sustainability in research activities and community service.

At the institutional level, HEIs generally form SDG centre units. Among the 30 universities, 9 have established centres dedicated to the Sustainable Development Goals (SDGs): UI, Unpad, Unhas, UB, Undip, Untirta, UMM, Unila, and the Sumatra Institute of Technology. This development reflects a genuine commitment from these institutions to create units or organizations focused on researching and executing sustainability and environmental management initiatives within their campuses. Additionally, Indonesian academics participate in a collaborative platform known as the SDGs Center Network, which aims to facilitate coordinated, extensive, and effective implementation of the SDGs. Additionally, initiatives such as waste and garbage management programs and tree planting efforts represent other real actions. Some HEIs are trying to integrate sustainability into the curriculum and develop sustainability courses as primary evidence of sustainability integration in education. These findings complement the sustainability literature in HEIs, which focuses only on teaching and research.

The results of this research cannot reach all universities in Indonesia and are limited to the top 30 universities participating in UI Green Metric. Therefore, the scope of the study is very limited to 30 universities. Even then, not all universities provide access to sustainability reports for the public, thus reducing the depth of the sustainability discussion.

Given the study's scope and the methodological framework's characteristics, these findings should not be considered indicative of all strategic planning practices within higher education and academic literature. This research aims to establish a foundation for understanding sustainability trends in strategic planning during the study's period. Further research can be conducted in all universities, including private universities in Indonesia.

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