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Comparative Assessment of Sustainability Performance among Philippine Higher Education Institutions using UI GreenMetric Indicators (2024-2025): Basis for a Proposed Strategic Sustainability Enhancement Plan

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Abstract- ***This study compared the sustainability performance of Philippine Higher Education Institutions (HEIs) using the UI GreenMetric World University Rankings indicators for 2024 and 2025. Specifically, it described the sustainability performance of the participating institutions, determined whether significant differences existed between the two assessment periods, and developed a Proposed Strategic Sustainability Enhancement Plan based on the findings. The study employed a quantitative descriptive-comparative research design utilizing secondary data analysis. Publicly available data from the official UI GreenMetric World University Rankings were analyzed for 60 Philippine HEIs that participated in both assessment years. Descriptive statistics, the Shapiro–Wilk test, paired-samples t-test, and Wilcoxon signed-rank test were used to analyze the data. The findings showed that the Overall Sustainability Score and all six UI GreenMetric dimensions recorded higher mean scores in 2025 than in 2024. Significant improvements were observed in the Overall Sustainability Score and in the dimensions of Setting and Infrastructure, Energy and Climate Change, Waste, Water, and Transportation. However, no statistically significant improvement was found in the Education and Research dimension. Based on the findings, a Proposed Strategic Sustainability Enhancement Plan was developed to provide strategic directions for strengthening sustainability initiatives among Philippine Higher Education Institutions.***

Keywords: sustainability assessment, UI GreenMetric, higher education institutions, comparative analysis, strategic sustainability enhancement plan

I. INTRODUCTION

A. Background of the Study

Sustainability has become an important concern among higher education institutions (HEIs) as they respond to environmental challenges and the growing demand for sustainable development. Beyond their instructional role, HEIs contribute to sustainability through research, extension, campus operations, and the development of environmentally responsible practices among their stakeholders (Basheer et al., 2024). Sustainability assessment therefore provides institutions with a means of evaluating performance, identifying strengths and areas for improvement, and supporting long-term institutional planning (Singh et al., 2023).

One widely used sustainability assessment framework is the UI GreenMetric World University Rankings, established by Universitas Indonesia in 2010. It evaluates institutional sustainability through six dimensions: Setting and Infrastructure, Energy and Climate Change, Waste, Water, Transportation, and Education and Research (Sari & Tjahyono, 2012; UI GreenMetric World University Rankings, 2024). These dimensions cover both operational and academic aspects of sustainability and provide measurable indicators for institutional assessment and benchmarking.

Philippine HEIs have shown increasing participation in the UI GreenMetric World University Rankings, reflecting growing institutional attention to sustainability. At the institutional level, Tindowen and Millan (2025) examined the sustainability programs of a Philippine HEI using the six UI GreenMetric dimensions and demonstrated how campus sustainability initiatives can be linked with broader sustainable development goals. However, comparative studies examining changes in the sustainability performance of Philippine HEIs across assessment periods remain limited. Existing reports commonly emphasize rankings and institutional achievements,

providing less attention to changes in performance across the different sustainability dimensions.

To address this gap, the study compared the sustainability performance of 60 Philippine HEIs that participated in both the 2024 and 2025 UI GreenMetric World University Rankings. The comparison was intended to identify areas of progress and dimensions requiring further attention. The findings also served as the basis for developing a Proposed Strategic Sustainability Enhancement Plan to support continuous improvement in sustainability initiatives among Philippine HEIs.

B. Objectives of the Study

General Objective:

The study aimed to compare the sustainability performance of Philippine Higher Education Institutions (HEIs) using the UI GreenMetric World University Rankings indicators for 2024 and 2025 as basis for a Proposed Strategic Sustainability Enhancement Plan.

Specific Objectives:

Specifically, the study aimed to:

1. describe the sustainability performance of Philippine HEIs in 2024 and 2025 based on the Overall Sustainability Score and the six UI GreenMetric dimensions: Setting and Infrastructure, Energy and Climate Change, Waste, Water, Transportation, and Education and Research;
2. determine whether there were significant differences in the sustainability performance of Philippine HEIs between 2024 and 2025 based on the Overall Sustainability Score and the six UI GreenMetric dimensions; and
3. develop a Proposed Strategic Sustainability Enhancement Plan based on the findings of the comparative assessment.

C. Significance of the Study

This study provides evidence on changes in the sustainability performance of Philippine HEIs based on the UI GreenMetric indicators. The findings may assist HEIs, university administrators, sustainability offices and committees, and policymakers in identifying areas for improvement and strengthening sustainability-related initiatives and institutional planning. The study may also provide baseline information for future research on sustainability assessment and strategic sustainability planning in higher education.

II. METHODOLOGY

A. Research Design

This study employed a quantitative descriptive-comparative research design using secondary data analysis. Descriptive statistics were used to summarize the sustainability performance of 60 Philippine Higher Education Institutions (HEIs) that participated in both the 2024 and 2025 UI GreenMetric World University Rankings based on the Overall Sustainability Score and six dimensions: Setting and Infrastructure (SI), Energy and Climate Change (EC), Waste (WS), Water (WR), Transportation (TR), and Education and Research (ED). The comparative component examined differences in the sustainability performance of the same HEIs between the two assessment periods. Publicly available UI GreenMetric data were extracted and organized in Microsoft Excel for analysis. The findings were subsequently used as the basis for developing the Proposed Strategic Sustainability Enhancement Plan.

B. Population and Sample of the Study

The population of the study consisted of Philippine Higher Education Institutions (HEIs) that participated in the UI GreenMetric World University Rankings in 2024 and 2025. A total of 63 Philippine HEIs participated in 2024, while 89 participated in 2025. Using purposive sampling, the study included the 60 HEIs that participated in both assessment periods. Institutions that participated in only one of the two assessment years were excluded. The selected HEIs served as the units of analysis, and their sustainability performance was assessed using the six UI GreenMetric dimensions and Overall Sustainability Scores reported in the official UI GreenMetric database. The study was limited to the sustainability scores reported in the UI GreenMetric database and did not examine the specific institutional policies, programs, or practices that may have contributed to changes in performance.

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C. Research Instruments

A researcher-developed data extraction sheet in Microsoft Excel was used to extract and organize secondary data from the official UI GreenMetric World University Rankings for 2024 and 2025. The sheet contained the names of the 60 matched Philippine Higher Education Institutions (HEIs), their Overall Sustainability Scores, and their scores across the six UI GreenMetric dimensions: Setting and Infrastructure, Energy and Climate Change, Waste, Water, Transportation, and Education and Research. Prior to analysis, the extracted data were reviewed and verified for completeness, consistency, and accuracy.

D. Data Collection Procedure

Data were obtained from the official UI GreenMetric World University Rankings database for 2024 and 2025. Philippine HEIs that participated in both assessment periods and had complete sustainability performance data were identified and matched. The Overall Sustainability Scores and scores for the six UI GreenMetric dimensions were extracted and recorded in the researcher-developed data extraction sheet. The extracted data were reviewed for accuracy and completeness, organized, and prepared for statistical analysis. The results of the analysis subsequently served as the basis for developing the Proposed Strategic Sustainability Enhancement Plan.

E. Statistical Treatment

Descriptive statistics, including the mean, standard deviation, minimum, and maximum, were used to summarize the Overall Sustainability Scores and scores across the six UI GreenMetric dimensions for 2024 and 2025. The normality of the paired difference scores was assessed using the Shapiro–Wilk test. Variables with normally distributed paired difference scores were analyzed using the paired-samples *t*-test, while variables with non-normally distributed paired difference scores were analyzed using the Wilcoxon signed-rank test (Field, 2018). Statistical significance was set at $p < .05$. All statistical analyses were performed using Jamovi version 2.7.37.

III. RESULTS

Sustainability Performance in 2024 and 2025

Table 1 summarizes the Overall Sustainability Score and the six UI GreenMetric dimensions. The mean Overall Sustainability Score increased from 5,257.92 (SD = 1,651.29) in 2024 to 5,810.04 (SD = 1,468.72) in 2025. Higher mean scores were recorded in 2025 across all six dimensions. The largest mean increases were observed in Waste, Transportation, and Water, whereas Education and Research showed the smallest increase. The lower standard deviations observed across all indicators in 2025 suggest reduced variability in sustainability performance among the participating HEIs.

Table 1. Descriptive Statistics of Sustainability Performance in 2024 and 2025

Indicator	2024 M (SD)	2025 M (SD)
Overall	5257.92 (1651.29)	5810.04 (1468.72)
SI	847.25 (285.90)	915.00 (257.72)
EC	1129.08 (403.79)	1209.42 (323.80)
WS	741.25 (386.66)	896.67 (365.09)
WR	433.50 (254.02)	531.42 (245.19)
TR	1022.50 (381.86)	1136.29 (311.00)
ED	1084.33 (347.38)	1121.25 (345.34)

Note. M = mean; SD = standard deviation; SI = Setting and Infrastructure; EC = Energy and Climate Change; WS = Waste; WR = Water; TR = Transportation; ED = Education and Research.

Differences in Sustainability Performance Between 2024 and 2025

As presented in Table 2, the Shapiro-Wilk test showed that the paired difference scores for Overall Sustainability, Setting and Infrastructure, Waste, and Education and Research were normally distributed ($p > .05$); therefore, paired-samples *t*-tests were applied. Energy and Climate Change, Water, and Transportation did not satisfy the normality assumption and were analyzed using the Wilcoxon signed-rank test.

Table 2. Inferential Test Results

Indicator	Shapiro-Wilk *p*	Test statistic	*p*
Overall	.946	$t = 8.64$	< .001
SI	.083	$t = 3.40$	.001
EC	< .001	$W = 1178.50$	.005
WS	.065	$t = 5.25$	< .001
WR	< .001	$W = 1436.50$	< .001
TR	.008	$W = 1284.50$	< .001
ED	.891	$t = 1.40$	.166

Note. W = Wilcoxon signed-rank test statistic. Normality was assessed using the paired difference scores (2025 − 2024). Statistical significance was set at $p < .05$

Significant differences were found in the Overall Sustainability Score, Setting and Infrastructure, Energy and Climate Change, Waste, Water, and Transportation ($p < .05$). Education and Research was the only dimension that did not show a statistically significant change, t (59) = 1.40, p = .166. Thus, the overall improvement between 2024 and 2025 was reflected across most operational dimensions, while progress in the academic dimension was comparatively limited.

IV. DISCUSSION

The significant improvement in the Overall Sustainability Score suggests broader progress in sustainability performance among the participating Philippine HEIs. Improvements in Setting and Infrastructure, Energy and Climate Change, Waste, Water, and Transportation indicate that institutional sustainability efforts were particularly evident in campus operations and resource management. These patterns are consistent with the emphasis of the UI GreenMetric framework on infrastructure, energy efficiency, waste management, water conservation, and sustainable mobility as important components of university sustainability performance.

Waste showed a substantial increase in mean score, from 741.25 in 2024 to 896.67 in 2025, while Water increased from 433.50 to 531.42 and Transportation from 1,022.50 to 1,136.29. These changes suggest stronger performance in operational sustainability measures. However, because the study analyzed secondary aggregate scores, the observed improvements cannot be attributed to particular institutional programs, policies, or individual UI GreenMetric assessment indicators.

In contrast, Education and Research increased only from 1,084.33 to 1,121.25, and the difference was not statistically significant ($p = .166$). This result indicates that the participating HEIs did not demonstrate a statistically detectable improvement in this dimension during the two-year period. Continued attention to sustainability-related academic and research initiatives may therefore be warranted, although the dimension-level data used in this study do not identify which specific Education and Research indicators require intervention.

V. PROPOSED STRATEGIC SUSTAINABILITY ENHANCEMENT PLAN

Based on the comparative findings, a Proposed Strategic Sustainability Enhancement Plan was developed to support continuous improvement in sustainability performance among Philippine HEIs. The plan focuses on sustaining improvements across the UI GreenMetric dimensions while giving continued attention to Education and Research, which did not show a statistically significant improvement between 2024 and 2025.

Table 3. Proposed Strategic Sustainability Enhancement Plan

Dimension	Strategic Direction	Key Proposed Actions
Setting and Infrastructure	Sustain the significant improvement in sustainable and accessible campus infrastructure	Improve learning spaces, green areas, pedestrian facilities, accessibility, and campus maintenance.
Energy and Climate Change	Sustain the significant improvement in energy efficiency and climate initiatives	Promote energy conservation, assess efficiency, strengthen climate-awareness programs, and monitor energy use.
Waste	Sustain significant improvement and strengthen responsible	Improve segregation and recycling, reduce single-use plastics, and strengthen

Dimension	Strategic Direction	Key Proposed Actions
	waste management	hazardous and electronic waste management
Water	Sustain the significant improvement in water conservation and management	Promote conservation, address water losses, monitor water quality, and support sustainable water management.
Transportation	Sustain the significant improvement in safe and sustainable campus mobility	Improve pedestrian facilities, mobility management, vehicle maintenance, and emission-reduction practices.
Education and Research	Prioritize the strengthening of sustainability integration in academic and research activities	Integrate sustainability into curricular and co-curricular activities, support sustainability research, encourage publications and extension, and strengthen collaboration.

Note. The proposed actions are strategic recommendations derived from the dimension-level findings and may be adapted according to institutional needs, resources, and sustainability priorities.

VI. CONCLUSION

The findings indicate an overall improvement in the sustainability performance of the participating Philippine Higher Education Institutions between 2024 and 2025. Significant improvements were observed in the Overall Sustainability Score and in five UI GreenMetric dimensions: Setting and Infrastructure, Energy and Climate Change, Waste, Water, and Transportation. However, Education and Research did not show a statistically significant improvement, indicating an area that warrants continued institutional attention. These findings provided the basis for the Proposed Strategic Sustainability Enhancement Plan, which offers strategic directions for sustaining achievements and strengthening areas requiring further improvement.

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