

The Application Study of Green Metrics at 2 Indonesian Conservation Universities

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Abstract—The awareness of the importance of environmental sustainability is the hottest issue discussed in the last decade. The university as a public entity operating in the field of education and research, should pay attention to the interests of students, employees, lecturers, and the community affected by its operational activities directly and indirectly, environmentally and socially. This concept is known as the University Social Responsibility (USR). This research is primary research at 2 universities in Indonesia; the Universitas Indonesia, and the Universitas Diponegoro. Based on the assessment made by the UI Green Metric 2018, these 2 universities are the top 3 conservation universities in Indonesia. The method used is descriptive qualitative with indicators consisting of setting and infrastructure; energy and climate change; waste; water; transportation; education and research. This study was aimed to examine the perceptions of university stakeholders (such as lecturers, students, and employees) over the assessment of the UI Green Metric.

Keywords: *University Social Responsibility, Green Metric, perceptions of stakeholders*

I. INTRODUCTION

Public awareness of the importance of environmental sustainability for human survival has led to environmental issues being the most discussed topic in the last decade. Directly or indirectly, the issue affects business and operational activities in an entity. So the entity does not only focus on profit optimization but also pays attention to environmental issues. The follow-up of the entity's attention to the issue is accounting, with the application of the calculation of environmental costs in the disclosure of environmental information as an impact arising from the entity's business and operational activities. Accounting those studies specifically in the field of environment is called green accounting or sustainability. Public awareness of the importance of environmental sustainability for human survival has led to environmental issues being the most discussed topic in the last decade. Directly or indirectly, the issue affects business and operational activities in an entity. So that the entity does not only focus on profit optimization

but also pay attention to environmental issues. The follow-up of the entity's attention to the issue is accounting, with the application of the calculation of environmental costs in the disclosure of environmental information as an impact arising from the entity's business and operational activities. Accounting those studies specifically in the field of the environment is called green accounting or sustainability. Expectations from various parties that accounting in the future will produce and create green accounting information that is relevant, reliable, and competitive for all parties in assessing and making economic decisions that are more friendly and be attached to the people and the environment can be realized [1]

The implementation of green accounting policies in a business entity known as Corporate Social Responsibility (CSR) is a form of environmental responsibility arising from operational and business activities in a business entity. At the University this is better known as the University's Social Responsibility (USR), which is an ethical policy that improves the quality of the university with students, managers, lecturers, and all college employees, management responsibility related to education, cognitive, employment, and the environment produced by universities in Development that produce sustainable human being [2]. The factors that must be owned by an entity as a form of concern for the entity towards an environment are: having environmental awareness, followed by; community environmental involvement and the follow-up of these two factors are; environmental reporting, then enhanced by; environmental auditing activities to measure and evaluate organizational performance.

The disclosure policy of USR in Indonesia is voluntary, not an obligation for the entity. However, several universities have implemented the policy to realize Good University Governance, one of which is the Universitas Indonesia (ranked 27th in the world) and the Universitas Diponegoro (ranked 78th in the world) as a Conservation University based on UI GreenMetric in 2018. There are 6

indicators issued by UI GreenMetric those are: setting and infrastructure, energy and climate change, waste, water, transportation, and education and research. These six indicators are formed from sub-indicators, among others; campus open areas, and campus areas in the form of parks or plants that make up the arrangement of indicators and infrastructure (<http://greenmetric.ui.ac.id/rankingbycountry-2018/>).

This study aims to assess the perceptions of the stakeholders of the university consisting of lecturers, employees, and students of the assessment conducted by UI GreenMetric in 2018 with a total of 60 respondents at each university.

II. LITERATURE REVIEW

A. University Social Responsibility (USR)

USR can be defined as the University's ability to disseminate and implement a set of general principles and specific values, using four main processes: management, teaching, research and counseling [3] Lako (2018) stated that there are 6 constructs of green accounting principles, that are: the principle of sustainability or sustainability; the principle of asset recognition; the principle of recognizing liability in the event of loss or damage to the environment resulting from the entity's operational activities; matching principle in measuring the value between costs, benefits, and efforts to achieve social and environmental responsibility; the principles of integrated accounting processes; the principles of integrated information disclosure and reporting.

Research by [4] at the University of Technology Malaysia (UTM) stated that UTM has made a good contribution to 'the formation of social capital' by involving UTM communities through facilities, services, and programs carried out. Data from this research have proven that UTM facilities and services, as well as the programs carried out, have benefited all levels of society both in terms of capacity building, community empowerment, promoting sustainable lifestyles and good citizenship and providing affordable facilities.

[5] affirmed that there are six dimensions of USR those are: external projections, internal management, research, education on environmental values, education on social values and university-company relations, but only one that affects the overall perception of USR. That is internal management. The University recognized the importance of the conditions and social character of staff performance, promotes work-life balance, respects diversity and equal opportunities, efficient distribution of resources and a democratic and transparent process of electing authority. Thus, respondents were more satisfied with the university's performance related to internal USR. This perhaps caused by other aspects of USR (research, education on environmental values, university-company relations, education on social values and external projections) are outside of students' daily life considered by them as aspects that affect their overall perception of USR. Research by [2] at Yogyakarta State University (UNY) stated that UNY had a great concern for the environment, through personal awareness of each person who interacts at UNY including

students, lecturers or employees. Unfortunately, this concern was inversely proportional to UNY's involvement in the environment.

B. Green Metric

Some universities were consuming more electricity than the average KWH used per-capita in their country [6]. Furthermore, this research showed that the prediction cannot be used accurately, especially for the carbon footprint. The evaluation might help universities to improve their policy in reducing the electricity consumption and the greenhouse gas emission reduction policy, and mainly helps UI GreenMetric to speed up the verification process when necessary [6].

[7] state that aligning the Green Initiatives in certain universities in their own strategic plans which are aligned with the nine Environmental Sustainable Development Goals (ESD's) embedded in the seventeen Sustainable Development Goals (SDG's) will boost and accelerate such universities to be Green or Environmentally Sustainable because such SDG's are already mandated, approved and budgeted in the Government Strategic Work Plan which all legislation parties like the National Council (Parliament and Consultative Council) or Senate have already approved and embraced. [8] stated that by UI GreenMetric, Ton Duc Thang University (TDTU) gave a very reliable performance of Waste. This indicator includes 6 items and TDTU's record is listed as below: program to reduce the use of paper and plastic in campus: print when necessary; recycling program for university waste: partial (25% - 50% of waste); toxic waste handled: completely contained, inventoried and handled; organic waste treatment: fully composted, compost used internally and externally; inorganic waste treatment: partially recycled (less than 50%).

[9] state that the University of Sao Paulo (USP) campuses are environmentally responsible, providing students and staff with enjoyable, healthy and in close touch with natural places. On the topic "Transportation", the University of São Paulo stands out also. Incentives to improve choice for public transportation and biking within the university community are among the constant concern of the University of São Paulo, which will be keeping up efforts for that.

National Chi Nan University (NCNU) is committed to fulfilling its university social responsibility and thoroughly incorporating the concept of environmental sustainability into coursework and campus life. NCNU furthermore continues to embrace a vision of making positive impacts on local elementary and junior high schools, local communities, and society at large while becoming increasingly connected with the [10]. Furthermore, as an academic institution, NCNU also plays a part in ensuring the stable operation of society, the economy, and protecting the environment of our communities, and thus should lead society toward sustainable development. Concerning environmental issues, humanity is at a crossroads, and environmental education is paramount; this is why NCNU developed a four-pronged approach educational development, local action, industry-academia cooperation, and global integration based on the school's local

characteristics and the UN's sustainable development goals (SDGs).

[11] asserted that the university administration prepares the application for the 'green' rating, administers a contest of student projects and the allocation of resources for those, as well as the renovation and restructuring of university premises. Students are responsible for planning relevant student associations' agenda, generating ideas, participating in project workgroups, planning and driving environmental events. The authors conclude that it is possible to obtain a synergetic effect of the upstream development of the environmental sustainability of the university. [12] affirmed that the University of Szeged was committed to using renewable energy which is taken into consideration for each investment planning. The following examples confirm it: using geothermal cascade system for heating and cooling of five university buildings, solar panels on 24 buildings and unique technology of using the heat of wastewater to cool and heat one of the main buildings of the university, namely the Study and Information Centre.

Concerning the Strategic Plan 2012-2017, the Universitas Indonesia will continue to accomplish the program and policy, particularly in setting and infrastructure sectors to reach the university vision and mission in creating a sustainable campus. For sure, realizing a green and sustainable campus with eco-friendly based education infrastructure (eco-science-park) required strong commitment and supports from all faculties members, staff and students. This commitment includes the university budget for research and sustainability [13].

III. METHODOLOGY

A. Research Scope

This study aims to look at stakeholder perceptions from 2 universities which were included in the top 3 conservation universities in Indonesia based on the UI Green Metric 2018, the Universitas Indonesia and the Universitas Diponegoro. The stakeholders consisted of students, alumni, employees, and lecturers from each of these universities.

B. Research Population and Sample

The population and sample of this study were stakeholders from the 2 universities, each of which numbered 60 people and consisted of students, alumni, employees, and lecturers. The data of this study consisted of primary and secondary data. Secondary data used is literature related to USR, Green Accounting, and Green Metrics in the form of articles, books, and journals. Primary data is data about the perceptions of the university's 2 stakeholders which are distributed and collected via the WhatsApp <https://forms.gle/k1TVLa6nrhuaCAAnj9>.

C. Research Variables and Instruments

The research variables were assessment indicators made by the UI Green Metric to determine universities that care about the environment as a form of USR from around the world. The indicators consist of setting and infrastructure; energy and climate change; waste; water; transportation; education and research. These indicators were the variable in this study with sub-variables that vary among these variables.

1. The Setting and Infrastructure Variable (X1) consists of:
 - a. Availability of space and supporting facilities (lounge, wifi etc.) in a good open space (X1.1)
 - b. The relevance of open space design according to student needs (X1.2)
 - c. There is a time limit for good use of open space (X1.3)
 - d. Area on campus covered in forest (X1.4)
 - e. Area on campus covered in planted (X1.5)
 - f. The existence of a good campus effort in realizing a sustainable environment campus from year to year (X1.6)
2. Energy and Climate Change (X2) Variables consist of:
 - a. Using energy saving equipment (eg using lights with little power) replacing conventional devices (X2.1)
 - b. Well implementation of The Smart Building program (X2.2)
 - c. Well implementation of Green Building Program (X2.3)
 - d. The primary carbon footprint (eg motor vehicle use) is less than the campus population (X2.4)
 - e. Use of renewable energy sources on campus (X2.5)
3. Waste Variable (X3) consists of:
 - a. Good recycling program on campus (X3.1)
 - b. Good paperless program in every activity on campus especially in lecture activities (X3.2)
 - c. Good Treatment of organic and inorganic waste (X3.4)
4. Water Variable (X4) consists of:
 - a. Well implementation of The water conservation program on campus (X4.1)
 - b. The use of water saving equipment (eg autoflush, etc.) is good (X4.2)
5. Transportation (X5) consists of:
 - a. Adequate campus shuttle operations (X5.1)
 - b. Good policies regarding emission free vehicles (X5.2)
 - c. There is a good effort from campus to reduce parking space for private motorized vehicles from year to year (X5.3)
 - d. Efforts to limit the number of private motorized vehicles have been implemented well (X5.4)
 - e. Facilities for pedestrians are well available (X5.5)
6. Education and Research
 - a. Information and teaching from campus about environmental sustainability is well provided (X6.1)
 - b. There are many scientific publications published about the environment (X6.2)
 - c. Campus activities regarding environmental sustainability increase from year to year (X6.3)
 - d. There are many student organizations related to environmental sustainability (X6.4)
 - e. There is a disclosure of the Green Campus program in the University's financial statements (X6.5)

Each variable is measured by a Likert scale model that measures attitudes and real conditions in the field with statements of strongly disagree (SD), disagree (D), agree (A), and strongly agree (SA).

- a. SD with a score of 1 means that the respondent states disagree and states that in reality there is no application of the indicators of the green metric on the campus
- b. D with a score of 2 means that the respondent expressed disagreement and stated that in reality there was no application of indicators from the green metric on the campus
- c. A with a score of 3 means that the respondent agrees and states that in real terms there is an application of green metric indicators on the campus
- d. SA with a score of 4 means that the respondent agrees and states that in real terms there are indicators of green metrics applied on the campus

This model is grouped into 2 groups namely the AGREE group which states A and SA, and the DISAGREE group which states SD and D.

D. Data Analysis (Descriptive and Inferential)

Descriptive analysis is carried out related to respondent demographics and related variables. While inferential analysis is done by testing the normality and different tests.

1. Normality Test

Normality test is done in order to test the distribution of the data [14]. If the data is normally distributed or approaching, then the data is then performed various tests with parametric statistical methods. If the opposite occurs then the parametric method cannot be used, so a non-parameter statistical method is used.

2. The t-test

If the data are normally distributed and the sample is <30, then the Independent Sample T Test is used as a confirmation, ie as a test tool used to conduct a comparative analysis with the T test for 2 pairs of samples. However, if the data are not normally distributed and the sample is > 30 then use the Mann Whitney Test. This test was chosen because this study uses 2 independent samples, namely samples with subjects from 2 different groups.

IV. RESULTS AND DISCUSSION

A. Description Analysis

1. Description Analysis of Respondent Demographic

The respondents of this study were stakeholders from the Universitas Indonesia (UI) and the Universitas Diponegoro (UNDIP) which consisted of lecturers, employees, students, and alumni from the 2 universities. The number of respondents from these 2 universities was 60 each. However, the distribution obtained was not evenly distributed between the two universities. At the UI, respondents consisted of 7 lecturers (11.6%), 45 students (75%), and 8 alumni (13.3%). While respondents at the UNDIP consisted of 9 lecturers (15%), 1 employee (1.6%), 44 students (73.3%), and 6 alumni (13.3%).

TABLE I. RESPONDENT'S IDENTITY BASED ON PROFESSION

Respondent's Identity	Total Respondent		%	
	UI	UNDIP	UI	UNDIP
	Lecture	7	9	11,66667
Employee	0	1	0	1,666667
Student	45	44	75	73,33333
Alumni	8	6	13,33333	10
	60	60	100	100

Source: Data Processed, 2019

B. Descriptive Analysis of Variables

This analysis begins with a total description, then a breakdown of the description of these variables at each university.

1. Description of Structuring and Infrastructure (X1)

Table 5.2 relates to variable X1 (Structuring and Infrastructure) consisting of sub variables X1.1, X1.2, X1.3, X1.4, X1.5, X1.6 between the 2 universities. The biggest percentage is in sub-variable X1.5 in the AGREE group of 95%, this proves that respondents agree that the campus has a lot of plant / garden area (X1.5) as one indicator of the Green Metric that proves the campus as a campus conservation in Indonesia. Whereas the X1.3 variable in the AGREE group had the smallest percentage of 68.3%.

TABLE II. STRUCTURING AND INFRASTRUCTURE

STRUCTURING AND INFRASTRUCTURE	AGREE	%	DIAGREE	%
X1.1	112	93,33333	8	6,666667
X1.2	106	88,33333	14	11,66667
X1.3	82	68,33333	38	31,66667
X1.4	106	88,33333	14	11,66667
X1.5	114	95	6	5
X1.6	111	92,5	9	7,5

Source: Data Processed, 2019

Broadly speaking, respondents agreed (above 50%) that the X1 variable had been applied in accordance with an assessment conducted by the UI Green Metric.

TABLE III. STRUCTURING AND INFRASTRUCTURE

STRUCTURING AND INFRASTRUCTURE	AGREE		%		DISAGREE		%	
	UI	UNDIP	UI	UNDIP	UI	UNDIP	UI	UNDIP
	X1.1	56	56	93,33	93,33	4	4	6,66
X1.2	56	50	93,33	83,33	4	10	6,66	16,66
X1.3	43	39	71,66	65	17	21	28,33	35
X1.4	60	46	100	76,66	0	14	0	23,33
X1.5	59	55	98,33	91,66	1	5	1,66	8,33
X1.6	58	53	96,66	88,33	2	7	3,33	11,66
AVERAGE	55,33	49,83	92,22	83,05	4,66	10,16	7,77	16,94

Source: Data Processed , 2019

The description of variable X.1 is shown in table 4.3 above. The highest percentage is in the AGREE sub-variable group X1.4 at the University of Indonesia, which is 100%. This shows that all respondents at this university agreed that the campus had a large forest area (X1.4) in accordance with an assessment conducted by UI Green Metric. The smallest percentage is in variable X1.3, which is the limitation of time for good use of open space, with a value of 71.6% or as many as 43 respondents.

The smallest percentage of the AGREE group at the UNDIP was also found in sub-variable X1.3, which was 65% (39 respondents). While the largest percentage in this group is found in sub-variable X1.1, namely the presence of space and supporting facilities (lounge, wifi etc.) in a good open space of 93.3%. On average, respondents at this university agreed that indicator X1 was actually implemented in the field in accordance with the assessment of the UI Green Metric.

2. Description of Energy and Climate Change (X2)

Variable X2 consists of 5 sub-variables. The largest percentage in the AGREE group is found in sub-variable X2.3, which is 80.8% (97 respondents), this states that 97 respondents agreed that the Green Building program has been implemented well (X2.3) according to the assessment from UI Green Metric. While the smallest percentage in this group is in X2.4, namely the primary carbon footprint (eg motor vehicle use) is less than the campus population by 50% or 60 respondents from 120 respondents. The following

table shows the values of agree and disagree at the 2 universities)

TABLE IV. ENERGY AND CLIMATE CHANGE

ENERGY AND CLIMATE CHANGE	AGREE	%	DISAGREE	%
X2.1	84	70	36	30
X2.2	92	76,6	28	23,3
X2.3	97	80,8	23	19,1
X2.4	60	50	60	50
X2.5	69	57,5	51	42,5
Average	80,4	67	39,6	33

Source: Data Processed , 2019

As for the DISAGREE group, the largest percentage is found in sub-variable X2.4, 50%. The smallest percentage is found in sub-variable X2.3, namely 19.1% or as many as 23 respondents from 120 respondents who stated that they did not agree that the Green Building program was implemented well.

TABLE V. ENERGY AND CLIMATE CHANGE AT UI AND UNDIP

ENERGY AND CLIMATE CHANGE	AGREE		%		DISAGREE		%	
	UI	UNDIP	UI	UNDIP	UI	UNDIP	UI	UNDIP
	X2.1	40	44	66,67	73,33	20	16	33,33
X2.2	45	47	75	78,33	15	13	25	21,67
X2.3	51	46	85	76,67	9	14	15	23,33
X2.4	33	27	55	45	27	33	45	55
X2.5	36	33	60	55	24	27	40	45
Average	41	39,4	68,33	65,67	19	20,6	31,67	34,33

Source: Data Processed , 2019

In the AGREE group, the largest percentage of the University of Indonesia is located in sub-variable X2.3, namely the Green Building program has been implemented well by 85% (51 respondents), and the smallest percentage is located in X2.4 by 55% (33 respondents). On average respondents at this university agreed that the assessment conducted by UI Green Metric had been implemented in a real way, as seen from a percentage of 68.3% (41 respondents). At the UNDIP, the largest percentage of this group lies in the X2.2 variable (the Smart Building program has been implemented well) that is 78.3% or as many as 47 respondents, while the smallest percentage lies in the X2.4 variable that is equal to 45% (27 respondents).

For the DISAGREE group, the largest percentage at the UI lies in the X2.4 variable, which is 45% (27 respondents) which states that there is no implementation of the primary carbon footprint at the university based on the perceptions of the respondents. Similar to the UNDIP, the largest percentage lies in sub variable X2.4, which is 55% or as many as 33 respondents who stated DISAGREE or did not agree to the implementation of these indicators at the UNDIP.

3. Description Of Waste (X3)

Variable X3, consists of 3 sub-variables which are assessment indicators of the UI Green Metric. The following table shows the stakeholder perceptions of the 2 universities.

TABLE VI. WASTE

WASTE	AGREE		DISAGREE	
	UI	UNDIP	UI	UNDIP
X3.1	79	65,8	41	34,1
X3.2	73	60,8	47	39,1
X3.3	85	70,8	35	29,1
Average	79	65,8	41	34,1

Source: Proessed Data, 2019

The biggest percentage in sub-variable X3.3 is 70.8% or 85 respondents agree that the processing of organic and inorganic waste has been good (X3.3), and has actually been implemented at the 2 universities. In the same group, the smallest percentage lies in the paperless program variable in each activity on campus, especially in lecture activities (60.3%) or 60.8% or 73 respondents out of 120 respondents.

The description of table 6 is seen in table 7. From this table it can be seen that the largest percentage is found in the X3.3 variable both at the University of Indonesia (85%) and at the UNDIP (56.6%). And in the same group the smallest percentage lies in the X3.2 variable; UI 70% (42 respondents from 60 respondents), and Diponegoro University by 51.6% (31 respondents from 60 respondents). On average the respondents from these 2 universities agreed that the X3 variable (Waste) was implemented well in the 2 universities (table 6).

TABLE VII. WASTE ON UI AND UNDIP

WASTE	AGREE		%		DISAGREE		%	
	UI	UNDIP	UI	UNDIP	UI	UNDIP	UI	UNDIP
X3.1	46	33	76,67	55	14	27	23,33	45
X3.2	42	31	70	51,67	18	29	30	48,33
X3.3	51	34	85	56,67	9	26	15	43,33
Average	46,33	32,66	77,22	54,44	13,66	27,33	22,78	45,56

Source: Processed Data,2019

4. Description of Water (X4)

Water is one indicator used by UI Green Metric as its evaluation. This variable consists of 2 sub-variables from this study.

TABLE VIII. WATER

AIR	ADA		TIDAK ADA	
	UI	UNDIP	UI	UNDIP
X4.1	94	78,3	26	21,6
upX4.2	75	62,5	45	37,5
Average	84,5	70,4	35,5	29,5

Source: Processed Data,2019

TABLE IX. WATER ON UI AND UNDIP

WATER	AGREE		%		DISAGREE		%	
	UI	UNDIP	UI	UNDIP	UI	UNDIP	UI	UNDIP
X4.1	52	42	86,67	70	8	18	13,33	30
X4.2	45	30	75	50	15	30	25	50
Average	48,5	36	80,83	60	11,5	24	19,17	40

Source: Proessed Data, 2019

The largest percentage of this table, lies in sub-variable X4.1, namely the water conservation program on campus has

been implemented well with a percentage of 78.3% or as many as 94 respondents from 120 respondents who stated that in fact the program field was implemented.

The description table 9 shows the largest percentage lies in the X4.1 variable both at the UI by 86.6% (52 respondents) and Diponegoro University by 70% (42 respondents). There is a balanced percentage of the UNDIP respondents on the variable use of water saving equipment (eg autoflush etc.) has been good (X4.2), both in the AGREE and DISAGREE groups, each of which is 50%. But on average the respondents at these 2 universities stated that they agreed that this variable had actually been implemented in the field with a percentage of 70.4% (table 4.8).

5. Description of Transportation (X5)

Transportation is one of the indicators of assessment conducted by UI Green Metric. This variable consists of 5 sub-variables.

TABLE X. TRANSPORTATION

TRANSPORTATION	AGREE	%	DISAGREE	%
X5.1	80	66,6	40	33,3
X5.2	64	53,3	56	46,6
X5.3	56	46,6	64	53,3
X5.4	48	40	72	60
X5.5	100	83,3	20	16,6
Average	69,6	58	50,4	42

Source: Processed Data,2019

The biggest percentage of this variable lies in sub variable X5.5 (pedestrian facilities are well available) in the AGREE group that is 83.3% or 100 respondents out of 120 respondents, this shows that this variable has actually been implemented in the field . Whereas in the DISAGREE group the largest percentage is in the variable X5.4 (efforts to limit the number of private motor vehicles have been implemented properly) that is equal to 60% or a number of 72 respondents from 120 respondents who stated that this variable was not actually implemented in the field, so indicated that efforts to limit the number of motorized vehicles have not gone well.

Table.11 is a description of table 4.10, from this table it can be seen that the small percentage of the AGREE group on the X5.5 variable is caused by the small percentage at UNDIP, which is 28.3% or only 17 respondents out of 60 respondents who agree that there is a variable it was implemented at the university. The second largest percentage in the DISAGREE group is found in variable X5.3 (there is a good effort from the campus to reduce parking space for private motor vehicles from year to year) that is 63.3% or as many as 38 respondents from 60 respondents.

TABLE XI. TRANSPORTATION ON UI AND UNDIP

TRANSPORTATION	AGREE		%		DISAGREE		%	
	UI	UNDIP	UI	UNDIP	UI	UNDIP	UI	UNDIP
X5.1	56	24	93,3	40	4	36	6,6	60
X5.2	40	24	66,6	40	20	36	33,3	60
X5.3	34	22	56,6	36,6	26	38	43,3	63,3
X5.4	31	17	51,6	28,3	29	43	48,3	71,6
X5.5	58	42	96,6	70	2	18	3,3	30
Average	43,8	25,8	73	43	16,2	34,2	27	57

Source: Processed Data, 2019

6. Description of Education and Research (X6)

This variable consists of 6 sub-variables which are indicators of the UI Green Metric. The following table is the percentage of respondents' perceptions of the application of Green Metric at the 2 universities.

TABLE XII. EDUCATION AND RESEARCH

EDUCATION AND RESEARCH	AGREE	%	DISAGREE	%
X6.1	110	91,6	10	8,3
X6.2	110	91,6	10	8,3
X6.3	106	88,3	14	11,6
X6.4	96	80	24	20
X6.5	79	65,8	41	34,1
Average	100,2	83,5	19,8	16,5

Source: Data Processed, 2019

The biggest percentage lies in 2 sub-variables, namely variable X6.1 (Information and teaching from campus about environmental sustainability has been well provided) and variable X6.2 (There are many scientific publications

published about the environment), each of them is 91.6% or as many as 110 respondents from 120 respondents who agreed that these 2 variables have been implemented clearly according to the conditions in the field. While in the DISAGREE group, the largest percentage lies in the X6.5 variable (There is a disclosure of the Green Campus program in the University's financial statements), this may be due to the large number of respondents (students) not knowing that the disclosures are on the University's financial statements.

TABLE XIII. EDUCATION AND RESEACH ON UI &UNDIP

EDUCATION AND RESEARCH	AGREE		%		DISAGREE		%	
	UI	UNDIP	UI	UNDIP	UI	UNDIP	UI	UNDIP
	X6.1	57	53	95	88,3	3	7	5
X6.2	57	53	95	88,3	3	7	5	11,6
X6.3	52	54	86,6	90	8	6	13,3	10
X6.4	48	48	80	80	12	12	20	20
X6.5	45	34	75	56,6	15	26	25	43,3
Average	51,8	48,4	86,3	80,6	8,2	11,6	13,6	19,3

Source: Processed Data, 2019

Table 4.3 shows the distribution of respondents' perceptions at the 2 universities on the Education and Research variable at the 2 campuses. In the AGREE group, the largest percentage at the UI lies in the variables X6.1 and X6.2 with a percentage of 95% each or 57 respondents from 60 respondents who state that these variables have been implemented well at the university. While the biggest variable at the UNDIP lies in the X6.3 variable (Campus activities on environmental sustainability increase from year to year), which is 90% of the 60 respondents of the university.

C. Inferential Analysis

Data normality test is done by Chi-square test, with the following hypotheses:

- H₀: normally distributed data
- H_a: not normally distributed data
- α = 5%

If the Sig. <0.05, then H₀ is rejected, and vice versa.

Based on the results of the normality test with the Kolmogorov Smirnov test, the significance value of all variables is obtained <0.005. Thus the test results received H_a and concluded that the categorized data was not normal. Therefore to do a comparison between two samples can be done using non-parametric methods.

1. Data Normality Test

TABLE XIV. NORMALITY TEST

	Infrastruktur	Energy	Waste	Water	Transport	Education
Chi-Square	48.000	73.917	110.833	82.00	53.133	70.667
Df	11	12	9	5	13	10
Asymp. Sig.	0.000*)	0.000*)	0.000*)	0.000*)	0.000*)	0.000*)

Level Significance 5%

Source: Processed Data, 2019

2. The t-Test

Comparative tests were conducted for two universities which were declared as conservation universities in Indonesia based on an assessment from UI Green Metric, namely the UI and the UNDIP. This test is carried out using the Mann-Whitney Test which functions to see if there are differences in the application of Green Metric indicators at the two universities. The hypothesis proposed is as follows:

H1: There are differences in handling infrastructure as Green Metric indicators at the two universities

H2: There are differences in handling Energy as Green Metric indicators at the two universities

H3: There are differences in handling waste as Green Metric indicators at the two universities

H4: There are differences in handling water as Green Metric indicators at the two universities

H5: There are differences in handling transportation as Green Metric indicators at the two universities

H6: There are differences in handling education and research as an indicator of Green Metric at the two universities

Based on the estimation results, there were obtained several applications of the same Green Metric indicators for the two conservation universities, namely the use of energy and the application of education and research. Seen from Sig. > 0.05. While other variables (indicators) such as infrastructure, waste, water, and transportation have differences in their application at the two universities.

TABLE XV. COMPARATIVE ESTIMATES WITH MANN-WHITNEY TEST

Variabel	Mann-Whitney U	Sig. (2 tailed)	Notes
Infrastructure	5.150	0.000*	Differences
Energy	0.332	0.544	No Differences
Waste	3.973	0.000*	Differences
Water	3.282	0.001*	Differences
Transportation	6.100	0.000*	Differences
Education	0.896	0.272	No Differences

a. Grouping Variabel: Group
Level significant 5%

Source: Processed Data, 2019

V. CONCLUSION

Stakeholders' perceptions from the two universities on the 6 indicators made by UI Green Metric differ based on the descriptive of these variables. However, most of them agree that there are Green Metric applications on 2 campuses, with a percentage above 50%. Only the Transportation variable (X5) at Diponegoro University in the group agreed to a percentage below 50% (43%). The normality test with the Kolmogorov Smirnov test produced data that was categorized as abnormal, and the results of the non-parametric test with the Mann-Whitney test stated that only 2 variables were applied equally in the two universities namely energy (X2), and education (X6).

VI. SUGGESTION

The weakness of this research is the uneven distribution of questionnaires. Most of the respondents were bachelor students so it was assumed not to describe the real conditions of the field. For further research, it is recommended that respondents be distributed evenly and have priority respondents (such as deans and leadership elements) who know the policies and implementation of the Green Metric at the University.

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