International Journal of Economics, Business and Accounting Research (IJEBAR)
Peer Reviewed – International Journal
Vol-7, Issue-1, 2023 (IJEBAR)
E-ISSN: 2614-1280 P-ISSN 2622-4771
https://jurnal.stie-aas.ac.id/index.php/IJEBAR

GREEN CAMPUS IMPLEMENTATION BASED ON THE FOUR MAIN PILLARS OF DEVELOPMENT

Putri Nugrahaningsih[1], Titik Setyaningsih[2], Elsa Pudyaningrat[3]
Prodi D3 Akuntansi, Sekolah Vokasi, Universitas Sebelas Maret
E-mail: putrinugrahaningsih@staff.uns.ac.id

Abstract: The main background in this research is conducted to examine the implementation of the green campus program and to identify the attitude of the academic society of the campus toward the program. This research applies a descriptive-qualitative study. This green campus program is intended for all university members, including the students, lecturers, and staff. The results of the research are based on four (4) main pillars of development; Green Rose, Green Attitude, Green Lifestyle, and Green Infrastructure. This program has resulted in a shift in attitude, mindset, concept, and understanding toward the green campus program, which is beneficial for the balanced life of human beings and the continuity of the supportive nature in the future. The implementation of the green campus program had a positive impact on the students because it encouraged them to develop new habits.

Keywords: *academic society, environment, green campus, infrastructure, lifestyle.*

Submitted: 2023-03-16; Revised: 2023-03-20; Accepted: 2023-03-24

1. Introduction

Global warming is one of the problems that is attracting the world's attention. Global warming is an increase in the temperature of the earth's surface caused by trapped CO_2, CH_4, N_2O, and CFC in the atmosphere. The four types of gases have different presentations of global warming influences, with the largest 50% of the presentation being from CO2 (Nedhisa, 2017). In addition, it is also due to the increase in the greenhouse effect (Zamharir, 2016). This must be addressed immediately because it is considered to be harmful to living things in the world. Some of the impacts that can produced by global warming is an increase in the earth's temperature, climate change, an increase in sea level, ecological disturbances, and socio-political impacts. Impact of global warming has also been felt in Indonesia. The impact of global warming in Indonesia is increasingly felt because Indonesia is the largest contributor to carbon emissions in the world after the United States (Herpita, 2021). Several institutional studies, both from within and outside the country shows that the climate in Indonesia has changed since 1960, although scientific analysis and data are still limited (Supangat, 2013).

Several higher education institutions with independent initiation toward the green campus program have their standards of implementation of the green campus label and apply those standards to their institutions. One of the initiation programs is the UI GreenMetric. This program was established in 2010 with 95 member universities, which increased to 719 member universities in 2018. One of green campus ideas shows the relationship between ecology and neoclassical economics. According to (Bloom in Muljaningsih, 2018),

neoclassical economics and ecology are influenced by human actions This growing number shows the relatively high enthusiasm of the institutions toward the green campus program. UI GreenMetric employs several perimeters to determine objectivity. Green campus is one of the breakthroughs of green-building in changing the perception and lifestyle of academic societies to an awareness of an environmentally friendly concept, and this green campus also can be a program that has an impact to promote sustainable development (Arsal in Mahmood, 2021). Among the indicators that define a green campus, the category of education distinguishes it from green-building. The green-building, that means a criteria for the creation of an environmentally sound campus include the layout and condition of campus facilities and infrastructure, energy utilization and anticipation of global warming, integrated waste management, efficient use of water, use and creation of environmentally friendly transportation facilities, and environmentally sound education. In Indonesia, this concept has begun to be widely applied in various campuses (Setyowati, 2013)

This study examines the implementation of the green campus program at Universitas Sebelas Maret (UNS) using the categories of the UI GreenMetric. The data were obtained from the literature review and interviews with UNS and UI GreenMetric representatives, followed by a gap analysis. This analysis was used to compare the implementation of UNS's existing green campus program education with the standard average score of the UI GreenMetric Global Ranking System (ideal). The results have revealed that UNS scored lower than the UI GreenMetric Global Ranking System's average score, particularly in the Sustainability Publication category.

Countries around the world are currently developing special rating system tools for higher education institutions, one of which is UI GreenMetric. This rating system tool is a Green Campus Global Ranking System run by the Universitas Indonesia's Green Metric team. Green building indicators on UI GreenMetric include setting and infrastructure, energy and climate change, waste, water, and transportation, as well as education as a differentiator between green building and green campus. The Education category measures the institution's progress in green campus education. Within this category, indicators such as the ratio of sustainability courses to total courses, the ratio of sustainability research funding to total funding, sustainability publications, sustainability events, sustainability organizations (students), and sustainability websites are used to evaluate whether or not an institution has achieved the green campus standard (UI, 2020). Institut Teknologi Nasional (Itenas), Bandung, is one example of a private university belonging to this category.

UNS offers 13 majors and 650 courses, and this university has established an education development program known as "UNS' Research Strategic Plan (*Renstra* UNS)" since 2011. This Research Strategic Plan covers a research quality development program that focuses on seven major research groups aiming at sustainability and green campus (LP2M UNS, 3 2016). This demonstrates UNS's commitment to increasing environmental awareness within the institution. To ensure that the Research Strategic Plan is on track to meet its objectives, a measurement of the green campus program is required. The measurement in this research focuses on the education category in order to establish an educational environment that is consistent with the programs in plan. The identification of the existing conditions toward ideal conditions based on UI GreenMetric will make it easier for the campus members to organize efforts or strategies in dealing with any obstacles that may arise to complete the programs in the UNS' Research Strategic Plan. UNS is one of several universities that have taken the initiative to implement the green campus program independently. The university has its standards for applying the green campus label and participating in the program.

Green Campus or what is familiarly called a faculty or campus that prioritizes environmental insight and reforestation which has an understanding as a concept that prioritizes the practice of sustainable environmental protection, management, and preservation efforts in educational institutions (Atici, 2021)

UI GreenMetric is one of the program's initiators. This program began in 2010, with 95 universities participating as the pioneers. In 2018, the number of universities participating increased to 719. This growing number demonstrates the universities' enthusiasm for the program. The goal of this study is to identify the attitude of Universitas Sebelas Maret's academic societies toward the implementation of the green campus program, as well as the level of awareness of all students, lecturers, staff, and visitors toward the implementation of the green campus program. Furthermore, this research is designed to identify the challenges in implementing the green campus concept in each faculty at Universitas Sebelas Maret.

2. Research Method

The qualitative method was used in this study, with data collected through the use of questionnaires. Qualitative research is a study of an object with the researcher as the primary instrument, in-depth data collection, descriptive data, inductive data analysis, and emphasis on meaning rather than generalization (Sugiyono, 2017). Target informant is respondents consist of lecturers, students, educational staff, and leaders in all units at UNS with questionnaires from UI Green Metric and direction from UNS's Green Campus Team.

The research data were gathered with two techniques: direct interviews with respondents from the university's infrastructure department, primarily at the Center for Environmental Study of UNS and questionnaires distributed to UNS academic societies (lecturers, students, and staff) in each faculty.

Details of the Activities and Implementation

The research was conducted for two years. During the first year, some activities were performed, including:

1) Conducting a survey of respondents (academic society) on the implementation of the green campus program based on four (4) main pillars of development: Green Rose, Green Attitude, Green Lifestyle, and Green Infrastructure;
2) Socializing the green campus program using stickers;
3) Organizing a mini-garden competition on campus as a reference to the implementation of the green campus program by the Faculty of Economy and Business;
4) Managing environmentally friendly infrastructure;
5) Organizing an inspiring story event (Student Executive Board/BEM) featuring successful practitioners in managing the environment;
6) Conducting field studies at other universities to learn about green campus management;
7) Participating in international conferences for disseminating the research outcomes; and
8) Integrating green campus program into learning materials for the students.

3. Results and Discussion

3.1. Results (Findings of the Green Campus Implementation Survey of the UNS Academic Societies)

The data were collected using two methods: direct interviews with the staff of the university infrastructure department, particularly the UNS Center for Environmental Study, and questionnaires distributed to UNS academic members (lecturers, students, and staff). Thesurvey was conducted online using Google Form *(http://bit.ly/UNSGREENCAMPUS)*.

Meanwhile, the research questionnaire was divided into three sections: respondent profile; closed-ended questions related to the research variables, including the Green Rose, Green Attitude, Green Lifestyle, and Green Infrastructure; and open-ended descriptive and limited questions.

Campus Mini Garden Competition

Campus Mini Garden Competition has recently gained popularity throughout Indonesia, including at Universitas Sebelas Maret. The green campus program aims to create a campus that is comfortable, energy-efficient, and environmentally friendly. As an environmentally friendly green campus, UNS is constantly improving and demonstrating its concern for a clean, green, and friendly environment. Several activities have been organized to promote greening on the campus, one of which is the implementation of the planting program organized by the UNS 5 academic society. With this program, each student is encouraged to grow 5 plants during their study at the university, and this program is necessary to be done. These activities have been successfully carried out in several places, such as those that have been implemented in Canadian School (Cutter, 2009).

It is critical to implement a greening program when dealing with the current environmental crisis and global warming (Rubiantoro, 2013). Global warming is the thinning of the ozone layer as a result of the sun's heat, as well as a lack of fresh air and greening. Greening is an activity that effective and efficient in order reducing global warming and lowering carbon emissions (Agustinus, 2013). Greening benefits the environment by acting as the lungs of the environment, which are required by living creatures in their respiration process; controlling the environment to provide coolness, comfort, and freshness; preserving the beauty of nature; maintaining balance in nature to provide the ecosystem for the animals; protecting the environment, and providing beauty for the panorama. The benefits obtained by this program are in line with (Nasoetion in Archedia, 2009) stated: "The program Eco-Campus is basically set against the backdrop therefore, among other things, the campus environment should hopefully be a place that comfortable, clean, shaded (green), beautiful and healthy in gaining knowledge.

Greening provides numerous benefits for health, one of which is the presence of a flower garden, a space that is planted with various types of flowers. This flower garden is not like a town park, which typically requires a larger space. University members can create small flower gardens in the campus yard, and this idea encourages a mini garden competition. The event is organized to green the campus, take advantage of empty and barren spaces, and raise awareness of the students about the importance of caring for the environment.

Green Campus (GC) Program Socialization with Stickers and Eco-friendly Bags to All UNS Academic Societies

In accordance with the instruction of the Minister of Research, Technology, and Higher Education, the GC team, in collaboration with the research team, held a socialization event for new students of the Faculty of Economics and Business for the 2019 academic year. Socialization was intended to foster an appreciation for the environment starting from the students' early years of study. The research team collaborated with the UNS Green Campus Unit, led by Prof. Okid Parama Astirin M.S., and targeted the socialization to the new students of the faculty as the pioneer program in creating a clean, comfortable, and plastic-free campus. In the future, several other events, such as an open discussion on waste and the environment, involving new members of the Student Executive Board (BEM) would be organized as a part of the continuation program. In this program, cooperation is needed such as with BEM, because students who act as administrators of the Student Executive Board

(BEM) is required to have the ability to be able to cooperate, respect opinions and overcoming conflicts (Khotimah, 2014).

Several important aspects in the campus environment must be related to the green campus concept. The concept can be a fitness center. There are six things that need to be applied in order to create a green campus, namely smart water, smart energy, smart mobility, smart public services, smart building and smart rubbish (Wimala, 2016). These aspects can be realized because of the awareness of campus residents to the importance of a comfortable, beautiful and healthy environment. This indicator is important because awareness will increase participation which has an impact on environmental sustainability where campus residents do activities (M Amba, 2015).

During the socialization program, on Wednesday, 14 August 2019, the research team and the committee of the Introduction to Campus Life for New Students (PPKMB) in 2019 at the Faculty of Economics and Business distributed free tumblers and stickers promoting the green campus program to the new students.

The stickers had three main messages: sort waste, save water, and save energy. Aside from stainless straws and stickers, eco-friendly bags were also distributed. These bags were made of fabric to reduce the use of plastic bags for shopping and other purposes. The use of eco bags is one of the green products, which means that this product is made to protect the environment (Sumarwan in Aziz, 2012). While stickers are a form of socialization with image illustrations where the use of the media is easier to understand because illustrations can be make it easier for students to understand the content as well as find their own knowledge. (Fitriani et al.in Syarufah, 2020). The green campus socialization activities in the Faculty of Economics and Business are presented in Figure 1.

Figure 1. Green Campus Socialization Activities in the Faculty of Economics and Business and Campus Mini Garden Competition *(Source: Research documentation)*

3.2. Discussion of Online Survey with Google Form

A total of 227 responses were obtained from the online survey with Google Form (http://bit.ly/UNSGREENCAMPUS). The survey took the form of an online questionnaire, which was completed by UNS academic societies, such as students, lecturers, and administration staff. The questionnaire was divided into three sections: respondent profile; questions related to the research variables, including Green Rose (4 questions), Green Attitude (9 questions), Green Lifestyle (12 questions), and Green Infrastructure (4 questions), with options to limit the answers; and open-ended questions with descriptive and non-limited answers. The diagrams below depict the results of the survey with several questions.

Table 1. Results of Survey on Green Rose Variable

Item	Question	Result			
		Unavailable	Initiated	Programmed	Available
1.	Do you think there have been competitions during the Introduction to Campus Life for New Students (PPKMB) or events with the theme of environmental beauty, such as competitions to decorate trash cans and pots that will be planted with flowers in your faculty?	27.5%	6%	5.7%	60.8%
2	Do you think there are adequate green open spaces, both parks and campus forests, in every faculty at UNS?	27%	3.5%	3.4%	66.1%
3.	Do you think there is a budget allocation for gardening such as personal cleaning services and services in charge of watering, fertilizing, and caring for the garden?	17.5%	9%	9%	64.6%
4.	Do you think there have been efforts by the faculty to increase the number/area of green open spaces by planting trees?	30.2%	13.2%	12.7%	43.9%
	Average	25.55%	7.93%	7.70%	58.85%

Source: Processed survey data

Table 2. Results of Survey on Green Attitude Variable

Item	Question	Result			
		Unavailable	Initiated	Programmed	Available
1.	Has there been an appeal through a sticker campaign to turn off the electricity?	38.6%	3.5%	5%	52.9%
2	Has there been any effort made to save on the use of clean water with a sticker campaign appealing to save water?	23.8%	5%	6.6%	64.6%
3.	Is there a waste recycling program that has been implemented (e.g.	70.4%	8.5%	6.3%	14.8%

	taking advantage of wudhu waste water for watering plants, recycling dirty water into clean water, using dirty water for flushing toilets, etc.)?				
4.	Do you think there is a faculty plan to build a smoking area?	58.2%	11.1%	11.1%	19.6%
5.	Has the faculty implemented a program to reduce the use of paper and plastic (e.g. students' thesis with flipped papers and reduced spaces between paragraphs, SMS gateway, as well as reducing the use of straws, bottles, styrofoam, cardboard in canteens and offices, etc.)?	50.3%	13.8%	9.5%	26.5%
6.	Has the faculty ever held environmental education by holding an exhibition with the theme "environmentally friendly"?	52.9%	14.8%	6.9%	25.4%
7.	Has there been an effort by the faculty or the university to invite campus residents (academics) to the "bike to campus" movement/or to use public transportation?	46.6%	15.3%	14.8%	23.3%
8.	Has there been any effort to save clean water, both physically (toilet using eco-flush and automatic faucet) and non-physically (call for water-saving behavior) in the faculty?	47.6%	10.1%	10%	32.3%
9.	Is there a water conservation program, for example planning the use of infiltration wells and rainwater storage, use of biopore infiltration holes, etc.?	42.3%	8.5%	12.2%	37%
	Average	47.86%	10.07%	9.16%	32.93%

Source: Processed survey data

Table 3. Results of Survey on Green Lifestyle Variable

Item	Question	Result			
		Unavailable	Initiated	Programmed	Available
1.	Do you think that there are restrictions on the use of parking facilities for students by implementing a specific parking area, which only allows students in particular academic years to use certain parking spaces based on the rules?	73%	6%	2.5%	17.5%
2	Do you think the restrictions on the use of private vehicles at the time of graduation	83.6%	4.2%	3.7%	8.5%

	have been realized?				
3.	Do you think there has been a realization of the use of Vehicle Permit Cards for teaching staff and employees to enter and use parking facilities within the campus?	79.9%	4%	3.9%	12.2%
4.	Do you think that special bicycle lanes are available?	71.4%	8.5%	6.3%	13.8%
5.	Do you think that bicycle parking spaces are available?	41.8%	3.4%	4%	50.8%
6.	Do you think bicycles are available on campus for free or rent at a low rate?	78.8%	5%	5.1%	11.1%
7.	Do you think there is already a cycling community?	78.3%	7.5%	5.2%	9%
8.	Do you think pedestrian infrastructure is available (e.g. information boards, trash cans, traffic signs, lighting, seats)?	19%	8.5%	4.2%	68.3%
9.	Do you think there is already a campaign on the benefits of walking on campus?	66.1%	11.6 %	7%	15.3%
10.	Do you think there have been campaigns to reduce the use of private motorized vehicles?	67.2%	8.5%	6.8%	17.5%
11.	Do you think the number of bus fleets has increased?	72.5%	5.8%	11.1%	10.6%
12.	Do you think there are activities to improve campus bus management? (e.g.: route, schedule, bus stop)	46.6%	8.5%	10.5%	34.4%
	Average	64.85%	6.79 %	5.86%	22.42 %

Source: processed survey data

Table 4. Results of Survey on Green Infrastructure Variable

Item	Question	Result			
		Unavailable	Initiated	Programmed	Available
1.	Do you think the smart building concept has been implemented in the faculty? Smart building is a building that uses automatic equipment, such as sensor lights, sensor faucets, sensor doors, safety (physical security, presence sensors, video surveillance/CCTV), energy, water (sanitation), indoor environment (thermal comfort and air quality), and lighting (illumination, low power lighting), etc.).	74.6%	6.6%	6.6%	12.2%
2	Do you think there is already the use of energy-saving equipment, such as LED lights, automatic faucets, and energy-saving air conditioners?	43.4%	10.1%	3.7%	39.2%
3.	Do you think the smart building elements (e.g. natural ventilation, full natural daylighting), building energy management,	59.8%	12.2%	10.6%	17.5%

	and green building have been used?				
4.	Has there been an effort by the faculty to intensify the building to a minimum of 4 floors (there are still buildings having < 4 floors) to minimize the reduction of open space?	39.2%	9%	10.6%	41.3%
	Average	54.25%	9.48%	7.88%	27.55%

Source: Processed survey data

4. Conclusion

This research gathered 189 data from students, lecturers, and staff as respondents in all study programs and units at Universitas Sebelas Maret and draw the following conclusion.

1) Green Rose
2) An average of 44-60% of respondents reported that UNS has had a sufficient greening program, plant maintenance, and infrastructure. The movement to plant plants and flowers is proclaimed in every new student orientation activity. The goal is for students to have insight into reforestation.
3) Green Attitude
4) An average of 40-50 % assumed there has been adequate appeal to conserve water and electricity. However, more than 52% of respondents admitted that waste recycling infrastructure has not been available. To reduce emissions at UNS, the campus must issue regulations encouraging all academic societies to use public transportation when visiting campus. This effort has been applied in several faculties, one of which is the Faculty of Engineering.
5) Green Lifestyle
6) An average of 60-70 % pointed out the limited regulations to reduce the use of private vehicles in the campus area. Based on the observation, they also highlighted the absence of a bike-to-campus campaign, as evidenced by the lack of a special route for bicycles and rental. Campus bus management should be improved in terms of schedule, route, and stops. UNS should provide centralized parking lots to reduce the number of private vehicles entering the campus area. On the other hand, the respondents considered that the university has provided adequate pedestrian lines in all faculties.
7) Green Infrastructure
8) A total of 74% of respondents explained that the concept of the smart building, such as automated lighting, automated taps, automated doors, safety instruments (physical security, presence sensors, video surveillance/CCTV), energy, water (sanitation), indoor environment (thermal comfort and air quality), and lighting (illumination, low power lighting), has not been applied in UNS. In terms of building intensification, the majority of the respondents detailed the four-story buildings are already provided to reduce the use of open spaces in UNS.

References

Agustinus, I. B., & Mujahiddin, D. E. (2013). Implementasi kegiatan penghijauan dalam program rehabilitasi hutan dan lahan (RHL) di kecamatan Sekolaq darat Kabupaten Kutai Barat. Agrifor: *Jurnal Ilmu Pertanian dan Kehutanan*, 12(2), 110-115.

Amba, M. (2015). Desain strategi pengelolaan green campus pada Universitas Pattimura. *Jurnal Arika, 9*(2), 83-90.

Archedia, L. (2013). Eco Campus (Studi Deskriptif Tentang Perilaku Mahasiswa ITS Terhadap Program Eco Campus. Jurnal Sosial dan Politik. *journal.unair.ac.id.*

Atici, K. B., Yasayacak, G., Yildiz, Y., & Ulucan, A. (2021). Green University and academic performance: An empirical study on UI GreenMetric and World University Rankings. *Journal of Cleaner Production*, 291, 125289. https://doi.org/https://doi.org/10.1016/j.jclepro.2020.125289

Bahamondes, M. (2003). Poverty-Environment Pattern in a Growing Economy: Farming Community in Arid Central Chile from 1991-1994. *Journal of World Development* Vol. 31 No 11 pp 1947-1957.

Blumer, H. (1969). *Symbolic Interactionism: Perspective and Method*. Berkeley. University of California Press.

Cutter-Mackenzie, A. (2009). Multicultural school gardens: Creating engaging garden spaces in learning about language, culture, and environment. *Canadian Journal of Environmental Education*, 14(1), 122-135.

Dale, V., and Suzane C Beleyer. (2001). Challenges in the Development and Use of Ecological Indicators. Journal of Ecological Indicator Vol. 1, 3-10 March 2001.

Danuri, M. (2016). Green Campus Berbasis Teknologi Informasi. *Jurnal Ilmiah Infokam*, 12(1).

Field, B.C. and Field, M.K. (2006). *Environmental economics; an Introduction*. Fourth Edition. Mc Graw-Hill Co Inc, USA

Karyanto, Puguh and Putri N. (2020). *Environmental Science.* Surakarta: UNS Press

Khotimah, L. N., & Fauziah, N. (2014). Hubungan antara kelekatan terhadap orang tua dengan kompetensi interpersonal pada pengurus badan eksekutif mahasiswa Fakultas di Universitas Diponegoro semarang. *Jurnal EMPATI*, 3(4), 335-345.

Lakswendra, A. (2013). Eco Campus (Studi Deskriptif Tentang perilaku mahasiswa ITS terhadap Program Eco Campus). *Jurnal dalam Fakultas Ilmu Sosial dan Ilmu Politik*, Unair, Surabaya.

Mandiangan, P., Amperawan, A., & Sukarman, S. (2017). Konsep Melestarikan Budaya melalui Upaya Penghijauan Lingkungan Kampus Politeknik Negeri Sriwijaya. Vitruvian: *Jurnal Arsitektur, Bangunan, dan Lingkungan*, 6(2), 185915.

Mehmood, A., Shahani, T. A., & Khuharo, M. A. (2021). Sustainability Implementation of UI Green Metric World University Rankings Energy & Climate Change (EC) Indicators: A Case Study of MUET Gymnasium Fitness Facility. *Indonesian Journal of Innovation and Applied Sciences (IJIAS)*, 1(2), 124-133.

Muljaningsih, S., & Galuh, A. K. (2018). Intention model of waste management education concept based on green campus in Brawijaya University. Indonesian *Journal of Environment and Sustainable Development*, 9(2).

Nedhisa, P. I., & Tjahjaningrum, I. T. (2020). Estimasi Biomassa, Stok Karbon dan Sekuestrasi Karbon Mangrove pada Rhizophora mucronata di Wonorejo Surabaya dengan Persamaan Allometrik. *Jurnal Sains dan Seni ITS*, 8(2), E61-E65.

PPLH UNS. (2018). Guidelance Green Campus UNS : Transportation. Retrieved May 18, 2021, from https://greencampus.uns.ac.id/wpcontent/uploads/2016/10/WebTRANSPORTASI-2018.pdf.

PPLH UNS. (2018). Guidelance Green Campus UNS : Energy and Climate Change. Retrieved May 17, 2021, from https://greencampus.uns.ac.id/wp-content/uploads/2016/10/

Puspadi, N. A. (2016). Perbandingan Kendala dan Tantangan Penerapan Konsep Green Campus di Itenas dan Unpar. Jurnal Reka Racana: *Jurnal Online Institut Teknologi Nasional* Vol. 2 (No.2), 23-35, Juni 2016

Reardon, T., and Stephen A. Vosti. (1995). Links Between Rural Poverty and Environment in Developing Countries: Asset Categories and Investment Poverty. *Journal of World Development* Vol. 23 No 9 pp 1495-1506.

Rubiantoro, E. A., & Haryanto, R. (2013). Bentuk keterlibatan masyarakat dalam upaya penghijauan pada kawasan hunian padat di kelurahan serengan-Kota Surakarta. *Jurnal Pembangunan Wilayah & Kota*, 9(4), 416.

Setyowati, E., Harani, A. R., & Falah, Y. N. (2013). *Green Building Design Concepts of Healthcare Facilities on the Orthopedic Hospital in the Tropics*. Procedia - Social and Behavioral Sciences, 101, 189–199. https://doi.org/https://doi.org/10.1016/j.sbspro.2013.07.192

Sugiyono. (2018). *Metode Penelitan Kualitatif.* Bandung: Alfabeta

Supangat, A. (2013). Perubahan Iklim di Indonesia. Kompas.Com. Retrieved May 22, 2021, from http://sains.kompas.com/read/2013/04/01/11290330/Perubahan.Iklim.di.Indonesia

Syarufah, S., Pratama, K. S., Liswanti, L., Lestianto, M. S. A., & Sofyan, A. (2021). Penggunaan media gambar dalam sosialisasi sekolah tatap muka kepada anak sekolah dasar selama masa pandemi covid–19. *Jurnal IICT*, 2(1), 9-13.

Utomo, A. Z., & Dwiyanto, B. M. (2022). Pengaruh Green Marketing Dalam Sosialisasi "Diet Kantong Plastik" Terhadap Keputusan Pembelian Pada Produk Eco Bag (Tas Belanja Ramah Lingkungan) Alfamart Melalui Minat Beli Sebagai Variabel Intervening (Studi pada Konsumen Alfamart di Kabupaten Pati). *Diponegoro Journal of Management*, 11(5).

UI, Secretariat. (2020). *Guideline of UI Green Metric World University Rangking 2020.* Depok: Universitas Indonesia

Wahyuni, H., & Suranto, S. (2021). Dampak deforestasi hutan skala besar terhadap pemanasan global di Indonesia. JIIP: *Jurnal Ilmiah Ilmu Pemerintahan*, 6(1), 148-162.

Wimala, M., Akmalah, E., Irawati, I., & Sururi, M. 2016. *Overcoming the Obstacles to Green Campus Implementation in Indonesia. Journal of Civil, Environmental, Structural, Construction and Architectural Engineering* Vol.10 (December), 1352–1357.

Zamharir, Z., Sukmawaty, S., & Priyati, A. (2016). Analisis Pemanfaatan Energi Panas pada Pengeringan Bawang Merah (Allium ascalonicum L.) dengan menggunakan Alat Pengering Efek Rumah Kaca (ERK): Analysis of Heat Energy Utilizationin Onion (Allium ascalonicum, L.) DryingusingGreenHouses Gasses (GHG) Drye. *Jurnal Ilmiah Rekayasa Pertanian dan Biosistem*, 4(2), 264-274.