

IMPLEMENTATION OF GREEN PUBLIC PROCUREMENT IN HIGHER EDUCATION INSTITUTIONS

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ABSTRACT

Purpose: This study attempts to present the Implementation of green public procurement (GPP) along with obstacles and solutions in Higher Education Institutions (HEIs)

Design/methodology/approach: The method employed is a qualitative approach using interview discussions supported by documentation on the website of three HEIs. Ten stakeholders, including procurement staff, participated in the study, providing diverse perspectives. The research takes place from October 2023 until January 2024, with the research locus in the three HEIs in Indonesia.

Findings: GPP is directed to support green campus programs, including sanitation and infrastructure, waste management, water saving, transportation with low emissions, renewable energy, and education and research. Leadership style, ability to innovate, and support from all academics in higher education determine the success of implementing GPP. Obstacles in implementing the GPP consist of regulatory, resource, and provider constraints that meet the requirements of the GPP. The solution that can be given to overcome these obstacles is to create strict regulations regarding the Implementation of GPP, create environmentally friendly procurement plans, make energy-saving and resource-saving movements, and look for providers that comply with GPP.

Research implications: This research provides implications for the practice of green public Procurement in higher education governance.

Originality/value: This ground-breaking empirical study concentrates on GPP in State Islamic Higher Education Institutions (SI-HEIs).

Keywords: green campus, green public procurement, higher education.

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IMPLEMENTAÇÃO DE CONTRATOS PÚBLICOS ECOLÓGICOS NOS ESTABELECIMENTOS DE ENSINO SUPERIOR

RESUMO

Objetivo: Este estudo tenta apresentar a Implementação de contratos públicos ecológicos (CPE), juntamente com obstáculos e soluções nas Instituições de Ensino Superior (IES).

Concepção/metodologia/abordagem: O método utilizado é uma abordagem qualitativa que utiliza entrevistas e discussões apoiadas por documentação no sítio Web de três IES. Dez partes interessadas, incluindo a equipe de compras, participaram do estudo, fornecendo diversas perspectivas. A pesquisa ocorre de outubro de 2023 a janeiro de 2024, com o locus de pesquisa nas três IES na Indonésia.

Conclusões: o GPP é direcionado para apoiar programas de campus verdes, incluindo saneamento e infraestrutura, gerenciamento de resíduos, economia de água, transporte com baixas emissões, energia renovável e educação e pesquisa. O estilo de liderança, a capacidade de inovar e o apoio de todos os acadêmicos no ensino superior determinam o sucesso da implementação de CPE. Os obstáculos na implementação do GPP consistem em restrições regulamentares, de recursos e de fornecedores que atendem aos requisitos do GPP. A solução que pode ser dada para superar esses obstáculos é criar regulamentações rígidas em relação à Implementação de CPE, criar planos de aquisição ambientalmente amigáveis, fazer movimentos de economia de energia e de recursos, e procurar fornecedores que cumpram com CPE.

Implicações da pesquisa: Esta pesquisa fornece implicações para a prática de contratos públicos ecológicos na governança do ensino superior.

Originalidade/valor: Este estudo empírico inovador concentra-se em CPE em Instituições de Ensino Superior Islâmicas do Estado (SI-HEIs).

Palavras-chave: campus verde, contratação pública verde, ensino superior.

APLICACIÓN DE LA CONTRATACIÓN PÚBLICA ECOLÓGICA EN LAS INSTITUCIONES DE ENSEÑANZA SUPERIOR

RESUMEN

Propósito: Este estudio intenta presentar la Implementación de la contratación pública verde (CPE) junto con los obstáculos y soluciones en las Instituciones de Educación Superior (IES).

Diseño/metodología/enfoque: el método empleado es un enfoque cualitativo que utiliza discusiones de entrevistas respaldadas por documentación en el sitio web de tres instituciones de educación superior. Diez partes interesadas, incluido el personal de adquisiciones, participaron en el estudio, aportando perspectivas diversas. La investigación se lleva a cabo desde octubre de 2023 hasta enero de 2024, con el foco de investigación en las tres instituciones de educación superior en Indonesia.

Hallazgos: El GPP está dirigido a apoyar programas de campus verdes, incluyendo saneamiento e infraestructura, gestión de residuos, ahorro de agua, transporte con bajas emisiones, energía renovable y educación e investigación. El estilo de liderazgo, la capacidad de innovar y el apoyo de todos los académicos en la educación superior determinan el éxito de la implementación de GPP. Los obstáculos en la implementación del GPP consisten en restricciones regulatorias, de recursos y de proveedores que cumplen con los requisitos del GPP. La solución que se puede dar para superar estos obstáculos es crear regulaciones estrictas con respecto a la implementación de la GPP, crear planes de adquisición respetuosos con el medio ambiente, realizar movimientos de ahorro de energía y de recursos, y buscar proveedores que cumplan con la GPP.



Implicaciones de la investigación: esta investigación proporciona implicaciones para la práctica de la contratación pública verde en la gobernanza de la educación superior.

Originalidad/valor: Este innovador estudio empírico se concentra en la GPP en las instituciones de educación superior islámicas estatales (SI-HEI).

Palabras clave: campus verde, contratación pública verde, educación superior.

1 INTRODUCTION

In the field of Procurement, the issue of GPP is one that government institutions widely discuss. GPP is a process of fulfilling the needs for goods/services of KLDI (Ministries, Institutions, Regional Work Units, and other Institutions) by minimizing the impact of environmental damage. GPP means that the raw materials and processes are environmentally friendly, energy efficient when used, and can be recycled when thrown away. The Implementation of GPP as a policy instrument within the Government is strengthened by Presidential Decree No. 59 of 2017 concerning the Implementation of the Achievement of Sustainable Development Goals (SDGs) in Indonesia. GPP is based on the concept of value for money to fulfill 3 (three) interests, namely, economic, social, and environmental. The GPP Policy aims to provide a list of environmentally friendly goods/services products that can be used to realize the Procurement of environmentally friendly goods/services with efficient use of natural resources and preservation of environmental functions to ensure the Implementation of sustainable development. The GPP policy is strategic, cross-sectoral, and involves parties, including the Government Goods/Services Procurement Agency (LKPP), Ministries/Agencies, Provincial Governments, and City/Regency Governments in Indonesia. One of the public sector organizations that must follow the GPP policy is the SI-HEIs.

There is a sustainable campus ranking event called UI GreenMetric in higher education. In 2023, 1,183 universities from 85 countries will participate in this event, of which 145 are universities in Indonesia. The UI GreenMetric 2023 assessment is based on three pillars, namely Environment, Economy, and Social, with weighted assessment indicators consisting of Campus Condition and Infrastructure (15%), Energy and Climate Change (21%), Waste Management (18%), Usage Water (10%), Transportation (18%), and Education and Research (18%). State and private universities under the Indonesian



Ministry of Education and Culture dominate this event. Only 12 PTKIN (State Islamic Religious Colleges) participated in the UI Green Metric event in 2023.

In response to the increasing urgency of environmental issues in society, governments have increased their awareness of the impact of their purchasing decisions. GPP has emerged as an important concept at national and international levels that helps drive markets towards environmental sustainability and generates positive environmental benefits (Walker & Phillips, 2009). However, GPP is a complex and extreme departure from traditional procurement methods and requires significant changes in the underlying organizational culture, beliefs, and technology surrounding procurement practices (Lindström et al., 2020). Furthermore, GPP does not refer to a single process but to the entire supply chain and types of services (Chersan et al., 2020). Therefore, investigations exploring the internal factors that support the successful Implementation of GPP have been ongoing for a decade.

Increasing awareness of using Information Technology-based procurement systems such as e-procurement (EP) is needed to increase GPP (Kumar & Rosé, 2011; Guo et al., 2012; Ramkumar & Jenamani, 2015). However, implementing GPP on an EP platform is more than just transferring procedures. However, this requires restructuring the various pre-award and post-award phases and integrating data and feedback, making this process simpler and making GPP more manageable (Vila et al., 2018) Thus, it is suggested that the next set of improvements in EP systems should enable the integration of operational data and the adoption of big data capabilities and a data-driven mindset (Bader Khamis AlNuaimi et al., 2021). Utilizing big data concepts can make the procurement function faster, more informed, and able to collaborate with other organizational functions to make more informed GP decisions throughout the product life cycle (Chidambaram et al., 2015). As a result, digitalization and data integration are considered an integral approach to preserving the environment and achieving sustainable exploitation of natural resources (Knebel & Seele, 2020). That is why increasing demand for more big data is needed to secure a sustainable future (Zaidi et al., 2019). In fact, the available literature on Big Data Analytics (BDA) shows that the public sector remains less studied than the private sector (Forshaw et al., 2017; Yokoe et al., 2018), and IT-based Procurement is rarely investigated in the context of GP and environmental performance (Chersan et al., 2020). Additionally, (Bashir et al., 2020) concluded that there is a need for additional research on Procurement in the public sector.



GPP in state universities is important. It has a direct impact on the environment, conservation of natural resources, and prevention of pollution. It can increase innovation and new economic development, improve the health of campus residents and the community, comply with regulations, and realize an environmentally friendly campus. The urgency of procuring environmentally friendly goods and services in higher education is not only related to protecting a green and friendly campus environment but is also important to the sustainability of cleanliness, prosperity, and beauty of the environment. Procuring goods and services in accordance with regulations responsibly, effectively, and efficiently will contribute to the realization of a healthy, clean, and beautiful world. The idea for this research emerged because several problems had to be solved immediately to achieve green public Procurement. This research focuses on GPP at SI-HEIs. The problem formulation can be explained as follows:

RQ1. How is the GPP implemented at SI-HEIs?

RQ2. What are the obstacles and solutions to implement GPP at SI-HEIs?

2 LITERATURE REVIEW

2.1 REGULATION OF GPP IN INDONESIA

The rules related to the Procurement of public goods and services were stipulated in Presidential Regulation 54 of 2010 concerning the Procurement of government goods/services, then amended and issued Presidential Regulation No. 35 of 2011 concerning the Procurement of government goods/services. There were changes so that Presidential Regulation No. 70 of 2012, changed again to Presidential Regulation No. 172 of 2014 concerning Procurement of government goods/services and Presidential Regulation Number 4 of 2015 concerning the fourth amendment, then the issuance of Presidential Regulation No. 16 of 2018. Definition of public procurement of goods and services is the activity of procuring goods and services by ministries/institutions/regional apparatus funded by the State Revenue and Expenditure Budget /Regional Revenue and Expenditure Budget ; the process starts from identification of needs to handover of work results (Presidential Decree No. 16, 2018).

The Implementation of GPP is based on regulations issued by the Government. The GPP policy in Indonesia from 2015-2020 has demonstrated encouraging progress.



An important milestone in the development of this policy is marked by the enactment of the Minister of Environment Regulation No. 5 of 2019 concerning Procedures for the Application of Environmentally Friendly Labels for the Procurement of Environmentally Friendly Goods and Services, which contains six categories of environmentally friendly goods and services based on predetermined schemes, namely: Copy paper, Stationery/File folders made from recycled plastic, Timber Legality Assurance System-certified wood furniture, Air Conditioning (AC) devices, Microwave, a medical waste treatment technology product for healthcare facilities, Autoclave, a medical waste treatment technology product for healthcare facilities. The National Public Procurement Agency has followed up the regulation with the operational Procurement of goods and services regulated in the Circular Letter of the Head of the National Public Procurement Agency No. 16 of 2020 concerning green products / green industrial products to be used in GPP for three products listed in the Minister of Environment and Forestry Regulation Number 5 of 2019. This regulation requires a major contribution from us and all stakeholders to support the Implementation of GPP by Presidential Regulation No. 16/2018 on Government Procurement and other regulations.

2.2 GREEN PUBLIC PROCUREMENT

GPP is a process of fulfilling the needs for goods/services of Ministries, Institutions, Regional Work Units, and other Institutions. All stages of the procurement process will benefit KLDI, society, and the economy by minimizing the impact of environmental damage. Environmentally friendly Procurement requires that the goods and services used are produced from environmentally friendly raw materials, processed in an environmentally friendly manner, when used, are energy efficient, and when disposed of or written off, can be recycled.

In response to the increasing urgency of environmental issues in civil society, governments have increased their awareness of the impact of purchasing decisions. GP has emerged as an important concept at national and international levels that helps drive markets towards environmental sustainability and generates positive environmental benefits (Walker & Phillips, 2009). However, GP is a complex and extreme advancement of traditional procurement methods and requires significant changes in the underlying organizational culture, beliefs, and technology surrounding procurement practices



(Omotayo et al., 2021). Furthermore, GP does not refer to a single process but to the entire supply chain and types of services (Chersan et al., 2020). For this reason, investigations exploring the internal factors that support successful GP implementation have been ongoing for a decade. Leadership attributes and styles are increasingly considered key antecedents to successful green organizational initiatives (Brammer & Walker, 2011; Pirayesh & Pourrezay, 2019; Liu et al., 2020; Singh et al., 2020).

Most previous studies on Sustainable Public Procurement (SPP) focused more on implementing only one aspect of SPP, such as the environment (Knebel & Seele, 2020), rather than the social or innovative aspects of Public Procurement. Additionally, as noted by Cheng et al. (2018), in some cases, the term sustainable procurement is used to refer to GPP. Several other studies point to the challenges that make it difficult to integrate environmental considerations into public Procurement and identify opportunities to overcome barriers and support GPP policies (Knebel & Seele, 2020; Lindström et al., 2020). However, there are exceptions, and some previous research has focused on applying social aspects in certain procurement processes, such as food procurement (Stefani et al., 2017). Stahl et al. (2020) have focused on how certain procedures can improve GPP implementation. Other studies focus on identifying possible strategies to include social aspects in public Procurement (Bernal et al., 2019) or collaboration between contracting authorities and suppliers (Witjes & Lozano, 2016). However, most previous research has worked with different operationalizations or conceptualizations of GPPs, making it impossible to provide a picture of how many GPPs, including their subcategories, are implemented and what patterns emerge within them (Kretschmer et al., 2021).

3 METHOD

This research aims to obtain facts about implementing GPP in state Islamic universities. Qualitative methods are used to answer the research problem formulation. Data in the form of interviews and documentation from three SI-HEIs in Indonesia, consisting of one University that managed to rank 1st, one University that ranked third at the SI-HEIs level in Indonesia in 2023, and one University that has not participated in the UI Green Metric event. This combination of SI-HEIs samples was taken to represent how GPP is implemented in SI-HEIs.



Primary data collection took the form of interviews and documentation obtained from the websites of each University. Research stages as carried out by (Miles et al., 2014). Data in structured interviews were conducted with key informants who understand the procurement of public goods and services at SI-HEIs. Next, data display and data condensation are carried out using content analysis. The final stage concludes the interpretation of qualitative data. The research was conducted from October 2023 to January 2024.

4 RESULTS AND DISCUSSIONS

4.1 THE IMPLEMENTATION OF GPP IN SI-HEIS

UI GreenMetric is an international awards event for universities that care about the environment and sustainability. The UI GreenMetric Award assesses several categories that universities must apply as in the following table.

Table 1

Category and Percentage of Total Points

Num	Category	Percentage of Total Points (%)
1	Setting and infrastructure	15
2	Energy and climate change	21
3	Waste	18
4	Water	10
5	Transportation	18
6	Education and Research	18
Total		100

Source: <https://greenmetric.ui.ac.id> proceed

The Implementation of GPP must be balanced with the commitment of campus leaders and residents regarding the green campus program. Fifty eight SI-HEIs have BLU status, so they are called universities. Among this number, only a few are committed to implementing a green campus in their place. The Implementation of the green campus, supported by green public Procurement, is carried out by SI-HEIs, which takes part in the UI Green Metric award event, where in 2022, there will be 10 SI-HEIs and 12 SI-HEIs in 2023. This fact is a good start for implementing GPP in the future.



The development of the Implementation of the green campus at SI-HEIs can be proven by the increasing achievements of SI-HEIs in obtaining awards in the UI Green Metric event, which can be explained according to Table 2 below:

Table 2

List of SI-HEIs participating in the UI Green Metric Event

Num	University Name	International Rankings		National Rankings		SI-HEIs Ranking	
		2022	2023	2022	2023	2022	2023
1	Universitas Islam Negeri Raden Intan Lampung	61	71	8	9	1	1
2	Universitas Islam Negeri Sultan Thaha Saifuddin Jambi	261	205	28	27	2	2
3	Universitas Islam Negeri Walisongo Semarang	271	342	31	36	3	3
4	Universitas Islam Negeri Syarif Hidayatullah Jakarta	318	381	34	39	4	5
5	Universitas Islam Negeri Raden Fatah Palembang	448	321	43	34	5	4
6	Universitas Islam Negeri Salatiga	684	789	61	83	6	7
7	Universitas Islam Negeri Alaudin Makassar	806	1003	82	102	7	10
8	Universitas Islam Negeri Sultan Aji Muhammad Idris Samarinda	822	926	84	92	8	8
9	Universitas Islam Negeri Fatmawati Sukarno Bengkulu	975	1130	106	125	9	11
10	Universitas Islam Negeri Maulana Malik Ibrahim Malang	1021	935	116	93	10	9
11	IAIN Metro Lampung		390		40		6
12	IAIN Ponorogo		1160		136		13

Source: <https://greenmetric.ui.ac.id/rankings> proceed

An overview of the Implementation of GPP in PTKIN can be presented in the explanation of two PTKINs that took part in the UI GreenMetric event and one SI-HEIs that still needs to take part in the UI Green Metric below.

4.2 UNIVERSITY A

University A has two campus locations. As the largest Islamic campus in Indonesia, University A has a big vision to become an international reference for the development of integrative-multidisciplinary Islamic knowledge and an environmentally friendly university by 2035. The main campus has an area of 45 Ha, and the postgraduate campus has an area of 5 Ha. University A is located in the suburban area of Sukarame, Bandar Lampung, the capital of Lampung Province. Surrounded by community housing, and there is green open space around it. The environment has high greenery, with a dry tropical climate at the beginning and a wet climate at the end of the year. Many green



plants provide shelter and conservation for birds at University A, such as the river kingfisher (*Todirhamphus chloris*), the Sriganti sunbird (*Nectarinia jugularis*), and the coconut sunbird (*Anthreptes malacensis*) which are registered protected bird species at University A. attachment to Government Regulation No.7 of 1999 concerning Preservation of Plant and Animal Species.

A separate website accommodates all activities, teams, and even sustainability reports on the University A green campus website. The Implementation of GPP can be seen from the physical Procurement of buildings, machines, equipment, goods, and other supporting services. The results of interviews with goods and services procurement officials regarding the Implementation of PBJ at University A are as follows:

"The Central Ministry of Religion handles the auction, while the management section is handled by the PPK in each faculty. Functionally, Procurement is handled by the faculty. University A has a campus green team whose job is to handle issues regarding campus green. University A was ranked first at the SI-HEIs level in the Green Campus Award. In the e-catalog, uploading items is now easier. The requirements that providers must have, namely KBLI (Indonesian Business Field Standard Classification) and KBKI (Indonesian Standard Commodity Classification), are complete and appropriate; at least a display case has been provided at LKPP or the Ministry of Religion, so you can enter your goods using pictures, descriptions, and specifications. Providers must also be verified by ATTITUDE (Provider Performance Information System). The provider first registers as a provider through the "SIKAP" application, which a verifier will later verify to assess the provider's credibility. "Meanwhile, the verifier is submitted from the University."

Meanwhile, the financial mechanism is explained as follows:

"Regarding finances in the UKPBJ section, there has never been a special inspection, but all financial or SPJ issues are verified first by SPI before disbursement is carried out. Meanwhile, TKDM uses self disclaimer. The basis for self-disclaimer calculations is based on the provider's statement or transfer of risk. So, all risks are left to the provider. Likewise, for e-catalogs, providers will be asked to state their willingness to bear the risk.

University A has an area of 455,957 m², 82.5% of which is open space, 26.72% is forest vegetation, 72.19% is planted with plants, and 23.79% is water catchment. University A is a green campus with 44.21% of the budget supporting sustainability.



There are also supporting facilities as follows: parking for people with disabilities, lift buttons for disabled people, toilets, ramp stairs available at 11 points on campus, 96 smoke detectors with safety sign stickers, eight fire hydrant units, 30 fire alarm units, 180 fire extinguishers, 22 emergency exits, evacuation routes, emergency procedures, health clinic, arboretum, and greenhouse. University A is very committed to energy efficiency by utilizing energy-saving devices, LED TVs (20% - 30% electricity savings), LED lights (90% of which are energy efficient), energy-saving computers in IT laboratories, and fans. Environmentally friendly.

Implementing the Smart Building concept at University A is reflected in the buildings that fulfill this concept: the New Rectorate Building, ICT Building, Faculty of Da'wah, Tarbiyah Faculty, Ballroom, Faculty of Science and Technology, and the Student Center building. Among the seven buildings, the New Rectorate building (total area 5,000 m²) and Ballroom (total area 5,500 m²) have met all the criteria for smart buildings: automation, safety, energy, water, indoor environment, and lighting. The total area of the seven buildings that implement the smart building concept is 137,300 m², while the total area of the University A building is 251,496 m². Thus, the smart building area percentage of the total building area is 64.52%. Renewable energy sources at University A consist of 27,860 kWh of solar panels per year, biomass producing 148 kWh of energy per year, and wind turbines providing 840 kWh of energy. kWh every year. The renewable energy usage ratio is 2.33%.

The Implementation of green Building is reflected in all development and renovation policies, such as an open space area in the middle of the Building for air ventilation and lots of windows for natural interior lighting by applying the concept of transparency for visual continuity and connectivity between buildings, vertical sides of the Building. Air vents to deflect air vertically. Apart from that, indoor vertical gardens in student dormitories and indoor air humidifiers in lecture buildings also support the green building concept. University A is committed to preserving the environment by implementing a zero-emission program, namely:

1. Car Free Day policy every Friday from 06.00 to 11.00 WIB;
2. Restrictions on private motorized vehicles for new University A students;
3. Install notification tags for separating energy-saving, water-saving, organic, inorganic, and B3 waste, turning off unused lights, and working healthily with computers;



4. Utilization of solar panels for street lights and lighting for several buildings at University A;
5. Campaign for a no-smoking policy throughout campus;
6. Routine maintenance of all electrical equipment, including AC.

The total carbon footprint (CO₂) at University A in 2023 is 1,511.53 MT (metric tons) with details of 1,034.69 MT from electricity use of 1,231,782.67 kWh, 0 MT from buses, 163.77 MT from 853 cars used enter. Campus, and 313.05 MT from 3,261 motorbikes entering campus. The Center for Technology developed University A's IT Development Direction, Information, and Databases (PTIPD), which implements the Implementation of Enable Green ICT. The program comprises smart data centers and networks, enabling green business processes and end-user computing. There are several services provided in the form of activities to support a green campus, including training for internal auditors for the ISO 14001:2015 environmental management system, community service for the use of organic waste for eco-enzymes, YSSSEE (Young Scholar Symposium on Science and Mathematics Environment) for sustainable development (SDGs). University A is trying to reduce the use of plastic and paper with the following program:

1. University regulations regarding restrictions on the use of plastic and paper;
2. Paperless administration by applying a barcode for signing;
3. Websites for academic purposes, such as SIARIL and SIGASTRA;
4. Utilization of e-learning for the teaching and learning process;
5. Tumbler campaign for the entire campus academic community to reduce the use of single-use plastic bottles;
6. Recycle organic waste into eco-bricks, beanbags, and other handicrafts.

Utilization of water-saving equipment at University A, such as automatic water taps and flushing toilets. Automatic water taps can save water usage throughout the work unit and flush the toilet. There are 1,652 toilet units, and 508 (30.75%) are water-saving, while 595 (33.24%) of the 1,790 water-saving automatic water faucet units are spread throughout the campus. University A is testing a pond water treatment system to produce water suitable for consumption. This system can change turbid water into clean water by filtering and removing contaminants. Processed water (or green water) has successfully passed laboratory tests regarding its physical and chemical properties. The water sampling locations are at 3 points, namely the SBSN Building, Pool A, and Pool B. Water



pollution control in the campus environment is carried out by carrying out laboratory analysis to determine water quality. Three water sampling locations are well water in the SBSN building, Pool A, and Pool B. The construction of the drinking water supply system (SPAM) at University A has complied with the Minister of Health's regulations regarding drinking water quality standards. Sucofindo carried out laboratory analysis based on physical parameters: smell, taste, temperature and total dissolved solids, as well as chemical parameters consisting of 19 parameters. The number of motorized vehicles (cars and motorbikes) entering campus divided by the number of campus residents is 0.118. There has been an increase in motorized vehicles compared to last year due to the re-introduction of offline lectures.

University A has a shuttle bus, but because the distance from the entrance gate to the exit gate is only $\pm 2,000$ meters, its Implementation is not practical. Campus official vehicles (minibusses) are provided to take guests or academics outside the campus. On the other hand, golf carts are provided for the entire community on campus and guests to tour and enjoy the beautiful views at University A. Courses or modules related to environment and sustainability are currently offered in 9 faculties and 47 study programs. Furthermore, in 2023, the number of majors offered will increase from 27 study programs to 110 study programs.

4.3 UNIVERSITY C

There are several indicators for implementing a green campus. The first indicator represents the University's efforts towards sustainability, especially in environmental management and open areas. This indicator assesses the ratio between the area of open space to the total area and population of the campus, the area of vegetation cover and planted forests, and the area of water catchment to the university budget for sustainability efforts. The main campus of University C is located in Semarang City, Central Java, Indonesia; University C has a total area of 30.4 hectares, of which 82% is green open space. Waste management and recycling activities are the main factors in creating a sustainable environment. Academic activities on campus produce a lot of waste; therefore, recycling and waste management programs must be one of the University's concerns. 80% of organic waste at the University is processed into compost. 70% of inorganic waste at the University is processed.



Water use on campus is an important indicator in GreenMetric UI. Water management involves reducing water use, improving conservation programs, and protecting communities. The criteria assessed in this indicator are the Implementation of water conservation programs, water recycling programs, and the use of water-saving equipment. The Water Conservation Program consists of 112 biopores and 25 suction wells. Transportation has a big influence on carbon emissions and pollution levels on campus. Transportation policies to limit the number of motorized vehicles, use of campus buses, and use of bicycles will create a healthier environment. The pedestrian policy will encourage students and employees to walk around campus and avoid using private vehicles. Using environmentally friendly public transportation will reduce carbon pollution around campus. Procurement for transportation programs in the form of pick-up and drop-off services, central parking areas, and zero-emission vehicles. There are 16 student organization activities related to sustainability. The number of courses related to sustainability is 273. The number of research publications related to sustainability is 137.

4.4 UNIVERSITY B

The development plan for Campus II (University B Integrated Campus) in Tanah Pajangan, Bantul, continues to develop. The construction of an integrated campus at B University will carry the Forest Campus concept, not just a Green Campus. This concept means that development will not damage the initial ecosystem that has lived and thrived in Guwosari. The B University campus will be in the middle of the forest of Bantul City. This concept will also have a positive impact on the social, economic, and socio-cultural conditions of the community around the campus and will even support the concept of developing the Bantul Regency as Bantul, an Independent City launched by the Bantul Regional Government. The Block Plan for the construction of the University B Integrated Campus consists of existing faculty buildings (Ushuluddin and Islamic Thought, Da'wah and Communication, Adab and Cultural Sciences, Sharia and Law, Islamic Economics and Business, Tarbiyah and Teacher Training, Social and Humanities, Science and Technology). Faculties to be developed (Psychology, Engineering, Public Health, Social Politics, Maritime Affairs) and Postgraduate buildings. Five Integrated Laboratory buildings, a Teaching Hospital, Ma'had (student dormitory), and the Center for Research and Community Service Building.



The Integrated Campus development infrastructure adheres to the Green Campus Spine Concept. As the main access to circulation, Green Transportation is implemented. The main lane in the middle is used by motorized vehicles, which prioritize public transportation (shuttle buses) because they can carry more passengers than private vehicles. Green Lane on either side of the main lane is space for shade trees, which absorb CO₂ and pollutants and improve the quality of the area's microclimate. Plants that absorb pollutants and provide shading have also been added to the facade of the third floor of the podium. Shared streets are used by pedestrians and non-motorized vehicles, building arcades as movement spaces for pedestrians that can be used when it rains.

The building mass along the Campus Spine consists of 3 podium floors, a podium roof, and four academic tower floors. All spaces in buildings along Campus Spine are used as shared facilities to accommodate joint activities between faculties. Meanwhile, the Forest Campus concept will show a social interaction space with large trees and a city forest atmosphere from the connecting bridge. Meanwhile, implementing Green Transportation in the Forest Campus utilizes the Campus Spine as the main regional connectivity route with environmentally friendly public transportation. This public transportation system runs with a looping system from end to end, serving the entire Green Compact Spine Block Design area. In order to connect with private vehicles from campus users, a park-and-ride system can be implemented where users can access the campus by parking their vehicle in the parking area at the end of the area and continuing their journey into campus using a Looping Spine Shuttle.

The B University integrated campus will also implement the concepts of Green energy, Green Water, and Green Waste. The Green energy concept means environmentally friendly energy can be developed using green Compact Spine Blocks. Environmentally friendly energy is obtained with solar panels implemented into the building skin. Solar panels can be configured as window shading, which provides a dual function: generating energy and reducing solar heat entering the Building. Utilizing building roof space for solar panels is also an alternative that provides the opportunity for an architectural expression known as Building building-integrated photovoltaic (BIPV).

Meanwhile, the Green Water concept optimizes water use within the Forest Campus. So retention wells and reservoirs can be developed. Retention wells function to help compensate for areas of land developed for pavement and buildings. Retention wells will help absorb groundwater and retain rainwater or run-off within the Forest Campus



area. As an alternative water source, Rain Water Harvesting can also be carried out by channeling gray water captured by the building shell to be collected and processed into clean water. Green Waste means the management of rubbish and waste in the Forest Campus area, which is carried out sustainably. This management can start from the smallest level by sorting waste, pooling, and continuing to the urban waste system (TPS and TPA). Organic waste that has been sorted can be managed independently with centralized compost facilities on campus. This compost can be reused or sold to those who need it so that a good environmental cycle occurs. That is how it is, explained Radiman.

Since 2022, University B has also started planting trees under the Chancellor's direction. The Implementation of regulations, cutting and planting trees, has begun in University B. There is also a policy that requires graduating students to plant one tree. Every tree planting also involves UKM, namely Mapala, the program that has been carried out is labeling trees in the campus area. At M University, almost every rector has a special program related to greening. At the location where the new campus will be built, it is planned to maximize the use of solar panels for energy savings. The hope is that 50% of the electricity will come from solar power to save energy. Likewise, campus two has also been prepared for waste processing, covering an area of 1.6 hectares, both liquid and solid waste. Everything is conceptualized like a forest campus. Later, it is planned that each faculty will compete regarding the use of waste, especially plastic, to beautify their respective buildings and will receive rewards. The source of funds for this reward is the proceeds from the sale of waste that has been collected. Regarding waste disposal, the University of B is still collaborating with outsourcing for collection and disposal to the landfill. Meanwhile, for B3 waste (waste from chemical use) in collaboration with PT. FIG.

In response to the increasing urgency of environmental issues in civil society, governments have increased their awareness of the impact of purchasing decisions. GPP has emerged as an important concept at national and international levels that helps drive markets towards environmental sustainability and generates positive environmental benefits (Walker & Phillips, 2009). However, GPP is a complex and extreme advancement of traditional procurement methods and requires significant changes in the underlying organizational culture, beliefs, and technology surrounding procurement practices (Omotayo et al., 2021). Furthermore, GPP does not refer to a single process but



to the entire supply chain and types of services (Chersan et al., 2020). For this reason, investigations exploring the internal factors that support the successful Implementation of GPP have been ongoing for a decade. Leadership attributes and styles are increasingly considered key antecedents to successful green organizational initiatives (Brammer & Walker, 2011; Pirayesh & Pourrezay, 2019; Singh et al., 2020; Zhang et al., 2021).

Ultimately, an organization's orientation toward sustainability is driven by an understanding of its leadership values (Stahl et al., 2020). Furthermore, Chan & Muthuveloo (2020) stated that leadership and innovation management are the two most important ways to increase competitiveness and achieve better environmental performance. Therefore, for GPP to be developed and sustained, organizations must drive change by enhancing leadership and innovation capabilities (Schwarz & Huber, 2008; Dost et al., 2016; M. Zhang & Hartley, 2018; Mazzucchelli et al., 2021). A successful GP transformation requires a shift in mindset to foster an environment conducive to innovation and new value-added activities related to sustainability and GPP (Kumar & Rosé, 2011; Fallon-Byrne & Harney, 2017).

GPP is a key issue for many EU Member States, gaining greater momentum in the coronavirus pandemic. The Recovery Plan for Europe and the Multiannual Financial Framework (MFF) proposed by the European Commission (EC) to help repair the economic and social damage caused by the coronavirus pandemic, kick-start the European economy, and create and protect jobs provide a framework for implementing structural reforms across the European Union (Lindström et al., 2020). According to the European Council, the Recovery Plan for Europe will require massive public and private sector investment at the European level to enable the Union to stand firmly on the path to a sustainable and resilient recovery while supporting green and digital priorities (Nodehi et al., 2022). Regardless of how public resources are spent, it should be remembered that, within the EU legislative framework, public authorities must provide services, goods, or works by the rules and procedures established by EU public procurement law. Public procurement is obtaining goods, services, and works through public contracts.

Several other studies point to the challenges that make it difficult to integrate environmental considerations into public Procurement and identify opportunities to overcome barriers and support GPP policies (Knebel & Seele, 2020; Lindström et al., 2020). However, there are exceptions, and some previous research has focused on applying social aspects in certain procurement processes, such as food procurement



(Stefani et al., 2017). Other studies focus on identifying possible strategies to include social aspects in public Procurement (Bernal et al., 2019) or collaboration between contracting authorities and suppliers (Witjes & Lozano, 2016).

4.5 OBSTACLES AND SOLUTIONS IN IMPLEMENTING GPP

University C procurement officials, when asked about several obstacles in implementing GPP, explained the following:

"There are three types of obstacles that occur in implementing GPP: regulatory obstacles, availability of providers, and resources. Regulatory Obstacles. Presidential Regulation Number 4 of 2010, as most recently amended by Presidential Regulation Number 70 of 2012 concerning the Procurement of government goods and services, does not require the application of environmentally friendly concepts in the Procurement of government goods and services. However, a method for evaluating bids for selection of providers has yet to be introduced and regulated in the form of a cost assessment system over the economic life, relevant to the concept of sustainable environmentally friendly Procurement. There are also no standard provisions for procurement documents that specifically refer to environmental friendliness. Apart from that, not all price standards for goods and services are regulated by the Government, and each Regional Government accommodates the interests of environmentally friendly Procurement. For example, the price of paper that is recommended to be environmentally friendly can be almost double that of paper that is generally available on the market but does not contain items categorized as environmentally friendly products. Provider Availability Constraints. The higher the environmentally friendly requirements specified, the fewer providers can meet the criteria. It turns out that it is not easy to find providers who meet the requirements to provide goods to support a green campus. We have to order special equipment which sometimes not all vendors can provide. Provider data in the e-catalog is also still limited to general items. Resource constraints. Implementing GPP to support a green campus requires quite large and complete resources. It is not only the campus area assets that must support a fairly large green open space; the existing land and buildings are old and did not use the green campus concept when they were first built. Furthermore, the human resources needed must also be experts in architecture, civil engineering, environmental engineering, transportation, information technology, and so on. On average, only a few SI-HEIs have opened science and technology majors, so they do not have the human resources to support a green campus. "Apart from that, what is no less important is that the budget required to support a green campus is quite large, while there is a more important need as the main task of higher education, namely tri dharma, which sometimes makes SI-HEIs reluctant to implement GPP on its campus."



This research found obstacles in implementing GPP, including the lack of strict rules, the lack of resources owned by PTKIN, and the provision of GPP, which took more work. According to Cheng et al. (2018), the reasons for the rare use of environmental considerations in public Procurement can be found in the need for appropriate regulations at national and international levels or the lack of training of procurement staff. Public procurement elements include procedures, type of contract, estimated price, final price, and savings from an empirical point of view (Džupka et al., 2020). In this regard, (Dutra et al., 2017) suggest that failure to implement GP may be traceable to inadequate technological and managerial capabilities. Therefore, governments, like other organizations, must continuously adapt their procurement activities to innovations in the market to pursue GP (Grandia et al., 2015) successfully. Some evidence has been gathered linking GP to innovation. For example, a study conducted in the UAE (AlNuaimi & Khan, 2019) found a positive relationship between IC and GP in the public sector. This relationship is also highlighted by (Grandia et al., 2015), who suggest that the public sector must constantly adapt its procurement activities to respond to innovations in emerging markets. Additionally, they argue that innovation in Procurement can lead to the creation of sustainable procurement models.

Another obstacle is the need for more resources at PTKIN to implement GPP. It has been suggested that important factors limiting the Implementation of GP are a misunderstanding of general organizational operations about the environment and employee engagement demonstrated by managers (Filho et al., 2020). Finally, a recent study conducted in the UAE concluded that leadership in change management is the most influential internal factor for GPs in the oil and gas sector (Hashmi et al., 2020). Blome et al. (2016) even suggested that top management characteristics are crucial for advanced green practices, including GP. However, which leadership style is more suitable for achieving successful GP implementation is still debated. Transactional Leadership (TSL) is considered less effective than Transformational Leadership (TFL) in this context and less correlated with high performance and productivity than TFL (AlNuaimi et al., 2021). Additionally, TSL can be accompanied by contingent punishment and reward behaviors, which are considered sources of effectiveness by the leadership, while TFL influences the overall thinking and behavior of those led, creating a unified understanding that results in success in organizational learning (Choudhary et al., 2013). Based on this, following the NRBV, we propose that leadership style influences the Implementation of GPP.



However, TFL can harm firm performance when combined with the possibility of high technological and low demand uncertainty (Zhang et al., 2019). Nevertheless, Dunne et al. (2016) found evidence to support the idea that leaders who inspire and who lead effective organizations build environments that are more likely to result in new product innovation. When AlNuaimi et al. (2021) compared the effect of TSL and TFL in increasing employee creativity, they found that the positive effect of TFL was more significant than TSL on employee creativity.

However, there can be more to be done, several solutions can be done. When interviewed by M University procurement officials, it was explained as follows:

"Based on existing obstacles, there are solutions that can be implemented. SI-HEIs can prepare a Chancellor's Decree containing environmentally friendly and sustainable-oriented procurement policies and regulations. As long as the regulations do not conflict with the public interest and are not intended to benefit individuals or groups, there is no need to hesitate to regulate them. It is important to avoid misperceptions between the parties involved in procuring goods and services and the supervisory/inspection apparatus. Budget Users/Authorized Users can prepare a General Procurement Plan with an environmentally friendly and sustainable perspective. Proposed needs for goods and services from work units are controlled and directed in type and volume. For example, plans to procure various types of paper, including tissue paper, are controlled because they use wood/tree raw materials. Plans to procure electronic equipment such as air conditioners and computers are controlled because they consume large capacities of electrical energy. Then, the Commitment Making Officer follows up by preparing specifications for goods/services and a contract design with an environmentally friendly and sustainable perspective. Next, the Procurement Officer/Procurement Services Unit follows up by selecting providers who are committed to environmental conservation efforts and also have environmentally friendly products. Make energy-saving moves to save resources. "Just use water as needed, use AC at a temperature of 23 - 25°C, service electronic equipment regularly, and make sure electronic equipment is turned off when not in use."



5 CONCLUSIONS

In its Implementation, SI-HEIs requires leadership commitment and support from the academic community. Innovation and the use of technology are also needed in the successful Implementation of GPP. GPP is directed to support green campus programs, including sanitation and infrastructure, waste management, water saving, transportation with low emissions, renewable energy, and education and research. Obstacles in implementing the GPP consist of regulatory, resource, and provider constraints that meet the requirements of the GPP. The solution that can be given to overcome these obstacles is to create strict regulations regarding the Implementation of GPP, create environmentally friendly procurement plans, make energy-saving and resource-saving movements, and look for providers that comply with GPP.

The results of this research provide implications for the practice of GPP in higher education governance. The results of this research also support the RBV (Resource View) theory, which suggests the need for certain resources to achieve a competitive advantage, especially in implementing GPP at SI-HEIs. This research can be a basis for SI-HEIs procurement officials in making policies related to GPP. This research also provides empirical evidence describing how GPP is implemented and the obstacles and solutions at SI-HEIs. Future researchers can research other variables that influence GPP and research related to green campuses with different research objects, theories, and research methods.

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