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STAKEHOLDER CAPABILITY CRITERIA OF GREEN PROCUREMENT FOR CONSTRUCTION PROJECTS IN MALAYSIA: A SYSTEMATIC REVIEW

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ABSTRACT

Sustainable development goals (SDGs) affect many aspects of society, including the construction sector. The construction sector consumes about 40 to 75 percent of the total value of materials extracted globally and almost half of the electricity generated in the country. Therefore, the world needs to shift towards green environmental practices. The government has introduced green procurement as one of the green initiatives to save the environment. In Malaysia, green procurement is still in the introductory phase. Thus, the main challenges in green procurement implementation are the need for more knowledge among the stakeholders and the reluctance to accept the changes. The perceptions of various stakeholders regarding their environmental responsibilities depend on their capabilities and sense of responsibility. Therefore, this paper aims to identify the people's capabilities that would help boost the implementation of green procurement in the Malaysian construction industry. This paper highlights the outcome of the literature review using a systematic approach and a snowball approach. The articles were extracted from reputable databases such as ScienceDirect, Web of Science, and Scopus. Twenty-seven capabilities factors were identified

from the systematic literature review, which will be further investigated in the next phase of the research. This research would contribute to the stakeholders in enhancing their capability to adopt green procurement. The right capabilities help an organisation obtain an opportunity and achieve outstanding performance.

Keywords: *People Capability, Construction project, Green procurement, Stakeholder*

INTRODUCTION

The construction sector is the foundation of the economic growth of any country. The sector also impacts every sector's role at all levels of the economy (Alaloul et al., 2021). The amount of construction work done in 2018 was valued at RM 145.5 billion as of the year's end, up 5.1% from RM 138.5 billion in 2017 (Noor et al., 2021) . Meanwhile global construction output is expected to be US$4.5 trillion between 2020 and 2030 to reach US$15.2 trillion while the global construction output in 2020 was US$10.7 trillion (Oxford Economics, 2021). The construction sector in the Malaysian economic industry is relatively small compared to other sectors such as manufacturing, agriculture, education, and services. In 2019, the highest construction value was recorded, reaching approximately RM167.38 billion. The Department of Statistics Malaysia reported that the value of construction works contracted by 6.1 percent in the first quarter of 2022. This shows that the construction sector contributes significantly to the national gross domestic product (GDP). Hence, its development is critical (Estache, 2006).

Although the construction industry helps generate the economy, it cannot be denied that its complex process has caused a significant impact on the environment. Waste disposal, energy and water depletion, global warming, waterways pollution, and other types of environmental impacts have all been linked to the construction sector. A serious call to reduce the effect of construction on the environment needs to be made. The call to create awareness of the negative impacts on the environment caused by the construction industry needs to be addressed by the stakeholders.

It is well known that the construction industry involves a vast variety

of stakeholders. There are two types of stakeholders, which are direct stakeholders and indirect stakeholders. A direct stakeholder is a person directly involved in the construction project, such as a client, project manager, supplier, contractor, subcontractor, and other construction project members. Meanwhile, indirect stakeholder is a person or group that is not directly involved in a particular project but still can be affected by its outcomes or consequences. These stakeholders are interested in the project and play essential roles in changing the direction of green practices in the project (Cochrane, 2017). The Malaysian government, as a primary client, has strongly emphasised environmental preservation, as seen in the efforts such as by the Ministry of Energy, Science, Technology, Environment and Climate Change (MESTECC) in supporting and funding high-impact research on green technology in 2009 (DOE, 2010).

Green procurement is also one of the initiatives introduced to the construction industry in conjunction with the effort to create a greener world (Wong, Chan & Wadu, 2016). However, a few challenges hinder the implementation of green procurement in the Malaysian construction industry. Bohari and Xia (2015) agreed that the lack of knowledge among stakeholders is a crucial challenge in green procurement implementation. Buniamin et al. (2016) stated that the lack of understanding and knowledge among people working with the public client and stakeholder organisation obstructs green procurement implementation. Hence, this lack of understanding and knowledge might influence the stakeholders to not fully appreciate and realize the benefits of green procurement. Therefore, this paper aims to determine the capabilities of people in encouraging green practices in construction procurement. A systematic literature review was conducted to establish a list of the capabilities of people as reported in past research.

Introduction to Green Procurement

The construction industry is often associated with environmental pollution due to its nature, which involves complex processes and high dependence on natural resources. According to Vascila et al. (2021), the construction industry consumes between 20 and 50 percent of all natural resources worldwide. It is crucial that serious steps be taken to reduce the ongoing environmental pollution in the construction industry. Bohari

(2017) emphasised that during the initial planning, environmental concerns must be considered throughout the construction phase before the project implementation. One of the efforts that can be made in the early stage of construction is to introduce environmentally friendly construction procurement.

The green agenda of the Malaysian government consists of a series of initiatives that encourage adopting environmentally friendly practices across all industries to lessen the dependency of the country on fossil fuels and their adverse environmental effects. One of many initiatives introduced by the Malaysian government is the adoption of green procurement in the construction industry. The term "green procurement" is defined by Ho and Dickinson as a series of research, evaluation, selection, use, and waste disposal measure to reduce the impact on the environment (Yang et al., 2019). Vilbert and Makafui (2019) highlighted that green procurement impacts the entire supply chain because suppliers and manufacturers are pressured to provide environmentally friendly equipment. Besides that, green procurement is a comprehensive strategy considering organisation, people, processes, and technology (Vilbert & Makafui, 2019). Bidin et al. (2020) believe that green construction methods are used more widely, and green procurement is developed to guarantee that green construction methods are used more widely. According to Bohari et al. (2017), developed countries have long recognised the value of and expanded the green procurement practices. However, Malaysia and other Southeast Asian countries still seem to be developing the idea. A few challenges have been identified as hindering the efforts of green procurement adoption.

Challenges of Green Procurement

Green procurement seeks to minimise the adverse environmental effects compared to other goods or services with similar functions or interests that meet specific environmental requirements (Mosgaard, 2014). Therefore, adopting green procurement in the construction industry not only benefits the environment but also benefits the corporate. According to Rais et al. (2018), advantages in terms of the environment can be obtained by minimising the adverse effects on local populations and ecosystems. Meanwhile, the corporate division benefits by bringing commercial values to the organisation by increasing reusable content, improving environmental

performance, and reducing operating costs. Despite the advantages of green procurement, it has been yet widely used in Malaysia.

According to previous studies, Malaysia's green procurement faces several challenges in its implementation. Lack of knowledge among stakeholders is one of the significant challenges hindering the performance of green procurement in the country (Bohari & Xia, 2015). A low understanding of green procurement causes the stakeholders to ignore the importance and benefits of green procurement. This can be evidenced by a statement from Buniamin et al. (2016), where the green procurement implementation is restricted by the poor level of awareness and expertise among those working in the public client and stakeholder organisations. A lack of environmental principal knowledge and comprehension could cause other employees to underappreciate the advantages of green procurement (Rais et al., 2018).

Green procurement was introduced in Malaysia in the 10th Malaysia Plan. However, it is still in the introductory phase (Buniamin et al., 2016). Lack of awareness of green procurement also obstructs the effort in green procurement implementation in Malaysia. McMurray et al. (2014) and Wong, Chan, and Wadu (2016) agreed that the lack of awareness of the green procurement concept slows down its execution. Another barrier to green procurement implementation is the need for more training. Moreover, Bidin et al. (2020) agreed that the lack of knowledge and information on green procurement results from their lack of training. The lack of training also causes insufficient qualified staff to manage green procurement (Adham & Siwar, 2012).

Since environmental responsibility is practiced in a way that meets the interests of the stakeholders, perceptions of environmental responsibility are influenced by the ability of the stakeholders. Therefore, this paper explores people's capabilities in green procurement implementation.

People's Capability to Implement Green Procurement in the Construction Industry

Based on previous research in Thailand, people's capabilities are identified as one of the critical success factors for sustainability (Shen et al., 2018). Figure 1 illustrates the capability dimension of an organisation.

To remain competitive over the long term, the capability dimension emphasises integrating, adapting, and reconfiguring existing internal and external organisational skills, resources, and capabilities toward survival in a changing environment (Sarpin, 2015).

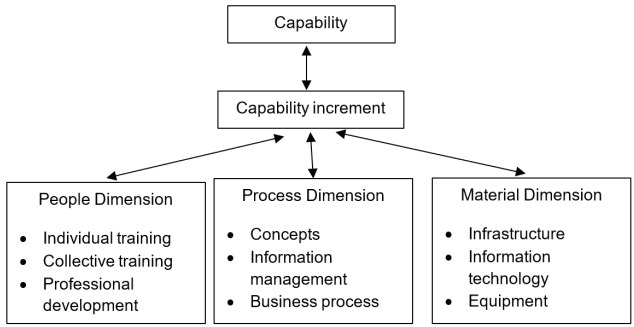

Figure 1. Capability Dimension

Source: Sarpin (2015)

The term "capabilities" refers to strategic "know-how" that has the power to influence future actions (Mousavi & Bossink, 2017). Lessman and Rauschmayer (2013) defined people's capabilities as the abilities, skills, and knowledge of individuals and how they use them to fulfil their purpose. Green procurement has been long introduced in Malaysia. However, as seen until today, this initiative has been poorly supported. The green procurement for goods and services was established in 2012. Nonetheless, data suggested that poor commitment from the top management has resulted in passive support for these measures (Ojo et al., 2014). People's capabilities are acknowledged as one of the key resources necessary for the successful change of an organisation (Brown, 2018).

Therefore, Sarpin (2015) emphasised that in promoting sustainability initiatives, it is essential to consider both the organisational capabilities and resources as well as the capabilities of the workforce and resources. The construction industry must consider the capabilities and skills of the individuals who contribute to superior performance at both the organisational and project levels.

METHODOLOGY

A systematic literature review is a process for identifying and evaluating research information on a specific research question (Adnan et al., 2020). Thus, a systematic literature review was conducted to identify the capabilities factors needed to implement green procurement in Malaysia. This systematic literature review was adopted to establish the capabilities factors in green procurement adoption. Systematic literature review was carried out from May 23 to July 28,2022 that specifically focus on research articles that were published between 2020 and 2022.

The literature review employed systematic and snowball approaches in the context of people's capabilities. The study was conducted in literature databases, namely ScienceDirect, web of science, and Scopus. The literature review structure for this research was explored via the keyword analysis: "(green procure*) and capability." A total of 1,182 articles resulted from the keyword search. Manual move analysis was used to identify similarities and differences between the three databases, which resulted in 28 duplicate articles being removed. We reviewed the abstracts and titles of the remaining 1,154 articles to assess if they fit with our research questions. The abstract review reduced the article dataset from 1,154 to 98 articles to be considered for further consideration. The full texts of these 98 articles were reviewed in-depth. Subsequently, 30 articles were excluded from the dataset because they did not sufficiently fit our research questions. Therefore, the final number of articles for the analysis comprised 53 articles.

RESULTS AND DISCUSSION

The final 53 articles were read thoroughly. All the capabilities identified from each article were tabulated manually, as shown in Figure 2. There were 27 capabilities identified from the systematic literature review. According to Sarpin (2015) the capabilities were classified into four categories of capabilities factors. Sarpin proposed the classification for a similar application based on the theory by Wiek et al. (2011). The factors were fixed into four micro categories: anticipatory, system thinking, interpersonal skills, and strategic capabilities. The research conducted by Sarpin focused on sustainability in facilities management. However, this model can be adopted into other contexts such as green procurement implementation.

Thus, the aim of this study is to identify the people's capabilities that will contribute to the implementation of green procurement in the Malaysian construction industry.

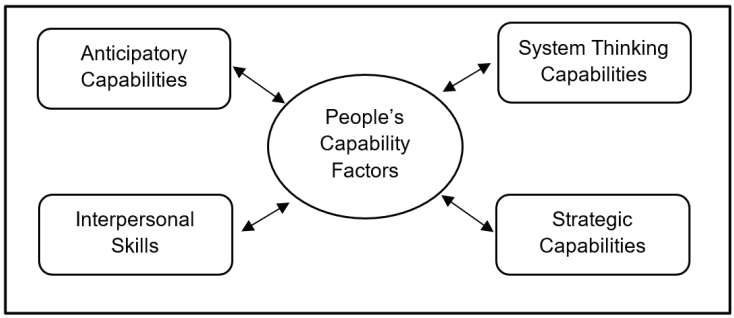

Figure 2. Key competencies in sustainability

Source: Sarpin (2015)

Anticipatory Capabilities

Anticipatory capabilities refer to the ability to envisage and create coherent "images" of the future and necessitate knowledge of future studies mediated by the goals and principles of sustainability (Withycombe, 2010). This capability may help gather and analyse information about the environmental impacts of different products and identify the emerging opportunities for a new sustainable strategy or technology. Anticipatory capability can contribute to analysing and evaluating sustainability actions and consequences (Sarpin et al., 2018). Anticipatory methods have been employed for decades in several domains and are increasingly used to support strategy and action for sustainability transformation (Henrichs et al.,2010; Wiek et al., 2012; Pereira et al.,2019).

System Thinking Capabilities

System thinking capabilities are the ability to analyse complex systems across three distinct sustainability pillars and on various sizes (Yang & Sarpin, 2014). Meanwhile, Wiek et al. (2012) defined system thinking capabilities as the ability to collectively analyse systems across different domains namely: society, environment, and economy, and across different scales. Knowledge sharing, green knowledge, and green training are capabilities under this category. All the capabilities listed under these categories should be tailored to address critical issues of sustainability

(Wiek et al., 2011). System thinking capabilities provide decision-making skills for future problems that can help people to incorporate crises to better prepare for systematic challenges that have yet to come (Roslan et al., 2021). Therefore, system thinking capabilities are crucial for developing transition strategies toward sustainability (Wiek et al., 2011).

Interpersonal Skills Capabilities

Interpersonal capabilities refer to the capacity to assist and empower stakeholders to address the problems and difficulties associated with the sustainability application (Sarpin & Yang, 2013). According to Wiek et al. (2011), this is the capacity to inspire, motivate, and encourage group collaboration and participation in sustainability research and problem-solving. Some of these capabilities include leadership, communication, and collaboration. Recognition, appreciating, and promoting diversity across all stakeholders and individuals in achieving sustainable organisational practice is a fundamental component of interpersonal capabilities (Sarpin et al., 2018). Multiple players with different backgrounds, resources, viewpoints, and interests are involved in and affected by sustainability concerns. Therefore, stakeholders must be equipped with these capabilities to implement green procurement in the construction industry successfully.

Strategic Capabilities

The ability to define and implement specific strategies for implementing sustainability in an organisation is referred to as strategic capabilities (Sarpin & Yang, 2013). These capabilities are the ability to gather and integrate resources and talents embedded within organisations to achieve strategic goals (Mumi, 2022). These capabilities require an intimate understanding of the strategic sustainability concept (Wiek et al., 2011). Some of the capabilities factors listed under this category include awareness of life cycle cost and total cost awareness, early involvement of contractors, and internal green policy. The sophistication of transition plans toward sustainability must meet the complexity of sustainability concerns (Sarewitz & Kriebel, 2010). The summary of the findings is presented in Figure 3 and Table 1.

The Significance of People's Capabilities in Green Procurement Implementation

Earlier sustainability scholars have recognised the significance of personnel and organisational capabilities in achieving sustainable goals.

According to Walshe et al. (2022), there is a massive overlap between the objectives of the capabilities approach and the SDGs. These capabilities are also thought to pave the organisation's way in achieving its green goals and targets (AlNuaimi & Khan and Liu; Liu & Yang, 2020). A solid set of capabilities allows people to participate fully in a society and contribute to the sustainability of their communities. Capabilities also help them adapt to change, innovate, and solve sustainability's complex challenges. Shen et al. (2018) state that people's capabilities are vital to successful organisational change. Therefore, this systematic review focused on people's capabilities and factors that will help boost green procurement adoption in the Malaysian construction industry.

Capabilities		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
A.	**Anticipatory capability**																																				
1	Stakeholders' engagement		*								*				*																						
2	Stakeholders' commitment to change		*		*			*	*		*				*					*	*															
3	Employees' commitment					*																			*											
4	Top management support																																				
5	Decision making																											*								
6	Stakeholders' awareness		*		*		*	*	*	*		*	*	*	*											*										
7	Foresighted thinking on the green agenda																											*								
B.	**System thinking capabilities**																																				
8	Knowledge sharing		*																																		
9	Green knowledge								*	*					*						*		*	*	*											
10	Skills related to green procurement								*	*					*						*		*	*	*											
11	Green training												*		*	*	*	*	*		*	*														
12	Technical competencies		*																																		
C.	**Interpersonal skills capabilities**																																				
13	Leadership		*																																		
14	Teamwork		*																			*														
15	Communication		*																																		
16	Procurer capabilities			*																												*	*				
17	Motivation																																				
18	Innovation					*														*							*									
19	Role model/leading effort																																				*
20	Collaboration															*					*		*				*									
D.	**Strategic capabilities**																																				
21	Early contractor involvement		*																																		
22	Green internal policy													*	*																						
23	Green incentives														*																						
24	Green project incentive														*																						
25	Life cycle & total cost of ownership awareness																																	*			
26	Familiar with government policy with environment																																		*		
27	Support corporate responsibility																																			*	

1 Fecma L., Zuo, J. & Rameezdeen, R. (2018), 2 Bohari et al (2020), 3 Rajevik, (2017), 4 Al Nuaimi et al., (2020) , 5 Al Nuaimi & khan, (2019), 6 Noranarttakun & Pharino, (2021), 7 Grandia & Voncken, (2010), 8 Grandia & Voncken, (2019), 9 Saferi et al. (2018), 10 Bal et al. (2013), 11 Wang et al.(2019), 12 Sanchez et al. (2014), 13 Liu et al.(2021) 14 Erzhadi et al. (2021), 15 Bader Khamis AlNuaimi et al. (2021) , 16 Najmi et al. (2020) 17 Igarashi (2013), 18 Khodaparasti et al. (2020), 19 Luzzini et al. (2015), 20 Wang et al. (2020), 21 Stekelorum et al. (2020), 22 Jurgilevicz & Poplavska (2019), 23 Pham & Pham (2021), 24 Jermsittiparsert et al. (2019), 25 AlNuaimi et al. (2021), 26 Yen and Yen (2012) 27 Olubunmi (2016) 28 Klor (2016) 29 Lambrechts et al. (2019) 30 Zaid et al. (2018) 31 Guoyou et al. (2013) 32 Dvaikata & Ali (2018) 33 Mohammad Bohari et al. (2016) 34 Qi et al. (2010) 35 Blowfield and Murray (2014) 36 Lehmann-Waffenschmidt et al. (2010)

Table 1. Summary of People's Capabilities Factors in the Implementation of Green Procurement

Classification	Capabilities factors	Authors
Anticipatory capabilities	Stakeholders' engagement Stakeholders' commitment to change Employees' commitment Top management support Decision making Stakeholders' awareness Foresighted thinking on the green agenda	Bohari et al. (2020), Bal et al. (2013), Ershadi et al. (2021), Al Nuaimi et al. (2020), Grandia and Voncken (2019), Grandia and Voncken (2010), Luzzini et al. (2015), Wang et al. (2020), Noranarttakun & Pharino (2021), Wang et al. (2019), Sanchez et al. (2014), Saferi et al. (2018),AlNuaimi et al. (2021),Yen and Yen (2012), Olubunmi et al. (2016).
System thinking capabilities	Knowledge sharing Green knowledge Skills related to green procurement Green training Technical competencies	Bohari et al. (2020), Grandia and Voncken (2019), Saferi et al. (2018), Ershadi et al. (2021), Wang et al. (2020),Stekelorum et al. (2020), Jurgilewicz and Poplavska (2019), Pham and Pham (2021), AlNuaimi et al. (2021a), AlNuaimi, Khan, et al. (2021b), Najmi et al. (2020), Igarashi et al. (2013), Khodaparasti et al. (2020)
Interpersonal skills capabilities	Leadership Teamwork Communication Procurer capabilities Motivation Innovation Role model/leading effort Collaboration	Ferme et al. (2018), Al Nuaimi et al., (2020),Rainville (2017), Luzzini et al. (2015),Stekelorum et al. (2020), Yen and Yen (2012),Zaid et al. (2018), Guoyou et al. (2013), Lehmann-Waffenschmidt et al. (2010)
Strategic capabilities	Early contractor involvement Green internal policy Green project incentive Life cycle cost and total cost of ownership awareness Familiar with government policy related to environmental legislation Support corporate responsibility	Ferme et al. (2018),Sanchez et al. (2014),Liu et al. (2019), Ershadi et al. (2021),Wang et al. (2020), AlNuaimi, Khan, et al. (2021b), Jurgilewicz and Poplavska (2019), Yen and Yen (2012), Mohamad Bohari et al. (2016), Qi et al.,(2010), Blowfield and Murray (2014)

RESULTS AND DISCUSSION

This systematic review provides an overview of the people's capabilities factors in implementing green procurement. From the study, 27 capabilities have been identified as people's capabilities in adopting green procurement. The establishment of capabilities will help to path the ways for stakeholders and organisations to adopt green procurement as a new routine. With the necessary capabilities, the organisation and stakeholders can apply sustainable practices through operation and strategic roles relevant to the

organisation's personnel. The capabilities factors identified will be analysed and validated through focus group discussions and questionnaires in the next stage. The list of capabilities from the outcome of this review can be a guide for future research. This systematic review may also be used to successfully implement green procurement in the construction project in parallel with the SDGs' call for sustainability.

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AUTHOR CONTRIBUTIONS

The authors made significant contributions to this article. Afiqah Iliyana, Sr Dr Asmah Alia and Associate Prof Sr Dr. Natasha Khalil contributed to the design and implementation of the research, analysis, and writing the manuscript.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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