Challenges and Drivers of Green Procurement among Construction Practitioners in Malaysia

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ABSTRACT

Construction is one of the sectors that contributes to a significant impact on the natural environment. There are many initiatives introduced to ensure that problems related to environmental degradation can be minimized. The introduction of green procurement is one of the strategies that helps in tackling issues related to the environment in the execution of construction projects in the Malaysian construction industry. However, knowledge of green procurement among construction stakeholders in Malaysia is still indicated as very low. Thus, the aim of this paper is to identify the driving factors in encouraging the inclusion of green practices in construction procurement. The findings of this paper provide the success factors identified from the literature review and focus group discussion. The outcome provides insights for construction practitioners to ensure green procurement in the delivery of construction projects.

Keywords: *construction; environmental; green procurement; success strategy*

INTRODUCTION

The construction industry plays an important role in increasing and improving economic development. The Malaysian construction industry is projected to contribute 5.5 percent to the Gross Domestic Product by 2020 (Economic Planning Unit Malaysia, 2016). There is a greater emphasis on the implementation of green procurement in construction projects to reduce the negative environmental impact of construction (Wong, Chan, & Wadu, 2016). Environmental impacts, such as the pollution of waterways, global warming, biodiversity loss, and air quality reduction, have been credited to the direct activity of construction supply chains. Crucial calls to preserve scarce resources and maintain a sustainable environment have made governments and many corporations worldwide determined in introducing environmentally-friendly practices and products (Salam, 2008).

According to Lafuente and Sanchez (2010), environmental consciousness is identical to what can be considered as the altitudinal (or psychological) measurement of pro-environmental behaviour. In light of the result of the environmental consciousness study, the commitment in environmental behaviours is identified with people's general convictions, information and a constructive propensity towards environmental policy measures and individual action. The pro-environment eco-friendly attitude will change the way of life of the society in guaranteeing that the obligation of protecting the environment can be borne together for future generations.

The strategic thrusts in the Eleventh (11) Malaysia Plan 2016–2020 is the response of the Malaysian government to promoting environmentally responsible practices in seeking after green development for maintainability and strength to actualize methodologies moving towards a low-carbon economy and accomplish supportable turn of events. The theme of the Eleventh Malaysia Plan (11MP) 2016–2020 is anchoring growth on people, which is secured on three primary components; individuals are the bedrock of the country, getting individuals ready for the future, and everybody appreciates development and improvement. The 11th Malaysia Plan concentrates on conveying high effect results to both the capital economy and individual economy at sensible expense in the Malaysian National Development Strategy. One of the six (6) strategic

thrusts is concentrating on seeking after green development for maintainability and strength. Concentrating on the sustainable consumption and production concept, the government will act as the driver to impose green markets in products and services including building developments (EPU, 2015).

Focusing on the implementation of government green procurement (GGP), the government has set GGP to be mandatory for all government ministries and agencies. However, it should be highlighted that green procurement in Malaysia currently, is only focusing on the purchasing of green products and services in Malaysia. In 2020, GGP for products and services has targeted that at least 20% of government procurement will be green (EPU, 2015). Furthermore, green procurement in construction projects is still at the developmental stage. Green practices in Malaysia are lacking due to insufficient support from the practitioners (Chan et al., 2014). End-users' commitment and cooperation in the proper use of their green buildings are essential to achieve the purpose of green buildings (Bohari et al., 2016). The lack of support from end-users is due to lack of awareness and understanding among the end-users, as it is difficult to educate them post-occupancy. Lack of corporate commitment and clear direction on green procurement adoption from top management is one of the common setbacks (Khan et al., 2018). Workers are often unable to pursue green procurement initiatives without support from the high-level management (Peprah, Brako, & Akosah, 2018).

Therefore, it is crucial to first understand why industry practitioners lack interest in implementing green practices, as well as in identifying the driving factors to adopt green practices in their procurement delivery. This paper aims to identify the driving factors in encouraging the inclusion of green practices in construction procurement through a focus group discussion session to produce the barriers and the drivers' conceptual framework that can be the basis for the next phase of the research, which is the quantitative phase. This quantitative phase will be carried out by adopting questionnaire surveys to reach a bigger number of respondents in Malaysia.

LITERATURE REVIEW

Introduction to Green Procurement

From the view of environmental management theory, all organizations must make sure that environmental protection is considered part of their main responsibility (Shelbourn et al., 2006). A construction project is usually connected to environment degradation issues and the impact on the natural environment is really worrying. The theory suggests that proper environmental management is needed in order to minimize environmental problems. Thus, environmental consideration must be integrated throughout the construction phases with early planning before the project is executed (Bohari, 2017).

There are several initiatives and strategies introduced by the government to ensure the implementation of green procurement. Green procurement is formed as a standard process to prevent environmental problems as well as maintaining human health. In construction practice, the early phase of decision making has the most impact towards a project's environmental track (Bohari, Skitmore, Xia, & Teo, 2017). Moreover, construction waste also leads toward environmental problems as well (Ikau & Joseph, 2017). Integrating procurement at the early stage is the most important factor in the successful delivery of green practices. Procurement is indeed one of the significant processes, which can be integrated with green practices during the project phases (Bratt, Hallstedt, Robèrt, Broman, & Oldmark, 2013; Ruparathna & Hewage, 2015; Zsidisin & Hendrick, 1998).

Green procurement has been introduced to ensure higher adoption of green construction practices. Although the importance and growing practices of green procurement have been acknowledged in developed countries, it appears to be a developing concept in Malaysia and other Southeast Asian countries (Bohari et al., 2017). Green procurement is a strategy to encourage a sustainable approach (Ruparathna & Hewage, 2015). The performance of sustainability involves three main factors, which are environmental, social, and economical (Pitt, Tucker, Riley, & Longden, 2009).

The term green procurement is being used interchangeably with other terms, such as sustainable procurement and environmentally friendly procurement. Green procurement refers to a process that integrates environmental considerations by incorporating the cost and quality into the process (Khan et al., 2018), reduces pollution and provides a positive impact on the environment (Bohari et al., 2017) from the project start to the end of the project (Bakir, 2015). Green procurement in the context of Malaysia is regarded as the "procurement activities of products, services and works considering environmental criteria and standard that conserve the natural environment and resources which minimizes the negative impact of human activities"(SCP Malaysia, 2013).

Green Procurement in Malaysian Construction Industry

In Malaysia, the government has introduced many short- and long-term initiatives that promote green procurement in construction projects. MyHijau programs were launched and established in 2012 to support green purchasing and green product technology under the Ministry of Energy Green Technology and Water (KeTTHA) and Malaysia Green Tech Corporation (MGTC). Nevertheless, the strategic framework of green procurement is still being developed to assist in providing specific guidelines for purchasing green materials and services as well as producing awareness among industry players (Bohari et al., 2017). Moreover, the Construction Industry Development Board (CIDB) has been promoting low-carbon and sustainable practices to increase the adoption of the Malaysian Carbon Reduction and Environment Sustainability Tool (MyCREST) among construction industry practitioners, which can be used as a benchmark for the green performance of a construction project. The government has prepared a Construction Industry Transformation Program (CITP 2016–2020) to spearhead and provide a blueprint to transform the construction industry of Malaysia that also calls for the construction industry to shift towards a greener approach.

The concept of green procurement for government projects focusing on products and services has been further discussed in publications by Adham and Siwar (2012) and McMurray, Islam, Siwar, and Fien (2014). Adham and Siwar (2012) highlighted that the pilot project on green procurement for products and services in Malaysia has been conducted, and thus, more training in promoting the concept of green

procurement is introduced. However, green procurement for the construction industry has yet to be adopted. There is no policy urging for green procurement in construction projects available, but there are a lot of other green adoption tools in project deliveries, such as the green rating tools and the Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST).

It is argued that the advantage of green procurement in construction is that it can help in improving the environment, construction process, and in building financial performance (Varnäs, Balfors, & Faith-Ell, 2009). It is important to highlight that the significant enabler for successful implementation of green procurement is the active involvement of other stakeholders by establishing mutual participation, understanding, and cooperation between stakeholders (Diabat & Govindan, 2011). Each stakeholder will be involved in the life cycle stages of construction. For instance, the government (preparation stages, briefing & design stage, and tendering stage), green council (preparation stages), developers (preparation stage and briefing & design stage), suppliers (preparation stage and tendering stage), consultants (briefing & design stage), contractors (tendering stage), and customers (preparation stage). Therefore, cooperation between all the stakeholders, such as the government, purchasing agents, clients, architects and engineering consultants, contractors, suppliers, and quantity surveyors is important to achieve sustainability in a construction project so that green procurement might be more efficient and increase the probability of a construction project's success (Khan et al., 2018).

Challenges of Green Procurement Implementation

Green procurement is recognized as procurement that significantly reduces the environmental impact of products and services compared to others that provide the same function, or products that accommodate certain environmental standards (Mosgaard, 2015). Previous research has suggested that the green procurement approach benefits the environment and can control environmental problems.

However, based on the literature, there are several potential challenges in adopting green procurement specifically for the construction sector. These challenges might hinder the procurement adoption. The

potential challenges have been identified as stated in Table 1. The challenges are summarized based on a few themes, such as commitment, knowledge, cost, awareness, readiness, training, and policy.

Table 1: Challenges of Adopting Green Procurement

Challenges to procurement initiatives		Authors
Commitment	Lack of support from management. Lack of sustainable practices in the organization's vision and mission. Poor commitment from top management. Poor market demand which indicates the lack of support from the industry players. Insufficient cooperation with academia and environmental organizations.	• Varnas et al. (2009) • Ojo et al. (2014) (a)
Knowledge & Innovation	Insufficient awareness on the importance of Green Corporate strategies, such as having a certified environmental management system or another company-wide environmental standard. Lack of internal corporate incentive – financial allocation. Poor in-house knowledge or experience in green products and difficulty in integrating green procurement policy elements into existing policy. Insufficient information sharing between construction firms and suppliers. • Lack of innovation in public sector • Lack of human resources and expertise • Lack of technical support and construction stakeholders' understanding on benefits of sustainable construction principles	• Preuss (2007) • Ojo et al. (2014) • AlNuaimi(2019) • Bidinet al. (2019)

Table 1: Challenges of Adopting Green Procurement (Continued)

Challenges to procurement initiatives		Authors
Cost	Perception of higher costs due to green procurement. Increase of project execution costs due to higher price of green building material. Higher cost and lack of resources and supply of green products. Additional project development costs.	•Mosgaard et al. (2013) •Sourani and Sohail (2011) •Simion et al. (2019) •Bidin et al. (2019) •Willar et al. (2020)
Awareness & readiness	Lack of understanding of how to incorporate green thinking into buying. Poor public awareness on the importance of green purchasing for construction project. Lack of awareness and research and development. Inadequate market supply of green products and services.	•Varnas et al. (2009) •Sourani and Sohail (2011) •Walker and Hampson (2008) •Ojo et al. (2014) •Preuss (2007)
Training	Lack of training and commitment towards green culture. Lack of decentralized/developed purchasing structures.	•Carter and Dresner (2001) •McMurray et al. (2014)
Policies & Guidelines	Absence of policy and guideline as external pressure Insufficient incentive to encourage green practices adoption The stakeholders are not guided by any specific definition of green procurement. Lack of enforcement of relevant laws Lack of regulatory frameworks for sustainable construction procurement.	•Walker et al. (2008) •Ojo et al. (2014) •Ruparathna and Hewage (2015) •Bohari et al. (2017) •Ogunsanya et al. (2019)

The Potential Drivers of Green Procurement Implementation

There are some drivers proposed as a way forward for green procurement to be successfully implemented. The drivers are divided into six (6) main categories to enable extensive implementation of green procurement in construction projects. They are: i) integration of green

practices, ii) guidelines and policies, iii) constant assessment, iv) carrot and stick techniques, v) management and corporate factor and stakeholder values. A summary of these drivers is given in Table 2.

S1 refers to the integration of green practices in the construction procurement to ensure a collaborative effort by the stakeholders in implementing green practices. The top management plays an important role in the integration of green procurement with the existing practices (Mosgaard, 2015). Albino et al. (2009) suggested that benefits could be achieved from environmental sustainability being integrated into business procedures, such as an efficient increase in the usage of resources, bigger sales, return on investment, new market development, improved corporate image, increase in competitive advantage, and product variation.

Table 2: Factors that Enable Extensive Implementation of Green Procurement in a Construction Project According to Various Authors

Ref	Authors	Proposed Strategies					
		S1	S2	S3	S4	S5	S6
1	Albino et al. (2009)	*				*	
2	Shi, Zuo, Huang, Huang, and Pullen (2013)	Section 1.01	*	*		*	
3	Alberg Mosgaard (2015)	*		*	*	*	*
4	Ruparathna and Hewage (2015)	Section 1.02	*				*
5	Bohari et al. (2017)	Section 1.03	*	*		*	*
6	Lam, Chan, Poon, Chau, and Chun (2010)	Section 1.04	*		*	*	
7	Wong et al. (2016)	*	*		*		*

S1- Integration of green practices, S2- Green policies and guidelines, S3- Constant Assessment, S4 - Carrot & Stick approach, S5- Management commitment factor, S6- Stakeholder Values

S2 refers to the availability of policies and guidelines pertaining green practices and green building in the construction industry. The policies and regulations need to be established and introduced to the whole construction industry supply chain before they can be enforced and articulated strategically to ensure the implementation of green construction. As we know, the construction waste also contributes towards environmental problem and to minimize it, it is important that the authorities enforced on the rules on the waste disposal. The construction

industry players play important roles in making sure that environment is being cared to fulfil the society expectations. One of the initiatives that can be implement that CIDB Malaysia can create the awareness on environment legislations among the construction industry players through training modules (Ikau & Joseph, 2017). The establishment of the policy for green practices and procurement will signal to the industry that they must adopt the new greener way of procuring a construction project. The top-down approach is needed as an effective key factor towards the implementation of green procurement in construction (Ruparathna & Hewage, 2015).

S3 refers to constant assessment of the green performance of the construction project. Varnäs et al. (2009) mentioned the tools to be used throughout the stages of a project in order to identify environmental requirements. They include three (3) assessments, which are impact, risk, and life-cycle. Conversely, the environmental assessment of buildings consists of three (3) functions that include promoting better green building performance, offering information for decision makers during design, and providing the amount of impacts on the environment from the buildings (Cole, 2010).This constant assessment is to ensure the compliance by the project stakeholders starting from the inception stage until the completion of the project.

S4 refers to the reward and punishment approach to drive the stakeholders towards green practices and green construction adoption. Carrot and stick techniques, such as rewards, recognition, short-course training, supporting and educating suppliers, as well as budget allocation are combined to ensure the implementation of green procurement can be successfully adopted in the Malaysian construction industry. In this light, we propose what we believe has become the most consensual solution among specialists: a stick and carrot approach. The stick is a policy such as energy efficiency obligations and charges which are to be imposed if the obligations are neglected, while the carrot consists of financial incentives awarded for green energy usage and efficient operation.

S5 refers to the top management commitment. The role of the government is important in ensuring green procurement concepts are being implemented by providing incentives, regulatory frameworks, and environmental standards. To achieve better results in the performance of

green projects, commitment from the whole project team is important because it will benefit the outcome (Bohari et al., 2017). Moreover, management support in terms of continuous valuation of green procurement is important to the current green procurement practices and it comprises a tradition of collaboration on department procurement, choices in purchasing, and significance in procurement processes (Mosgaard, Riisgaard, & Huulgaard, 2013).

S6 refers to the stakeholder values towards greening the construction procurement. Turner and Zolin (2012) indicated that the apparent outcomes of the project are affected by the perception of stakeholders towards the project, which influences the accomplishment of the goals set by the association. Stakeholders refer to internal and external stakeholders of the project and greater commitment of project stakeholders has been identified as project success factor. El-Gohary et al. (2006) stressed the point that stakeholders can be a decisive factor that can "make or break" a project. Meanwhile, values are considered as an influence on stakeholders' work-related behaviour (Carmelli & Tishler, 2004). The term value used in this paper refers to the organizational and individual level of commitment and capability towards the project's objective.

RESEARCH METHODOLOGY

This study used both primary and secondary data. The secondary data were from an extensive collection of research, articles, and journals from the internet. The secondary data were used to acquire information and knowledge on Green Procurement. The secondary data were also used to support the primary data. For the research procedure we have used the inductive reasoning, where we gathered the information and analysed the data using a focus group discussion. Inductive reasoning is a method where one's credentials through experience, thought and familiarity, including what are cultured from others, are used to draw the final observation and general finding.

Focus Group Discussion

Primary data were collected by using a Focus Group discussion (FGD) involving participants that consisted of experienced construction

practitioners and academicians to attain information on green procurement practices in the Malaysian construction industry. This FGD was conducted to confirm the possible challenges in green procurement adoption and the drivers for the adoption of green procurement in the Malaysian construction industry. The selection of the participants was based on their credentials, such as experience and educational background in both construction industry and green construction. The respondents who attended the FGD session must at least have undergone training on green construction or at least have been involved in one green project before.

Table 3: List of Participants' Background, Experience and Roles in Construction Project.

	Professional Background	Experience in Construction Industry	Involvement in Green Construction
P1	Quantity surveyor	Above 10 years	Contract and procurement
P2	Quantity surveyor	Above 10 years	Contract and procurement
P3	Administrator	Above 10 years	Contract and procurement
P4	Government procurer	Above 10 years	Policy maker
P5	Researcher	Above 10 years	Green Materials
P6	Government procurer	Above 10 years	Contract and procurement
P7	Government procurer	Above 10 years	Human capital
P8	Contract administration	Above 10 years	Contract and procurement
P9	Quantity surveyor	Above 10 years	Contract and procurement
P10	Quantity surveyor	Above 5 years	Pre- and post-contract in construction technology
P11	Researcher	Above 10 years	Green procurement
P12	Researcher	Above 10 years	Green materials

The FGD sessions were conducted face-to-face led by one main moderator who was assisted by rapporteurs. A discussion session lasted for 50–60 minutes and was audio recorded. All inputs from the FGD were compiled and transcribed for further analysis. Each participant was assigned a code number to keep the participants' anonymity. All responses recorded were kept strictly confidential and would only be used for

research purposes. All transcribed audio-recordings and the identification of any individuals, projects, or naming of organizations were also kept anonymous. The final discussion results were then emailed to the participants for validation purposes.

RESULTS AND DISCUSSION

The drivers as a way forward for successful implementation of green procurement were gathered through extensive literature review and validated through the conducted focus group. The strategies were divided

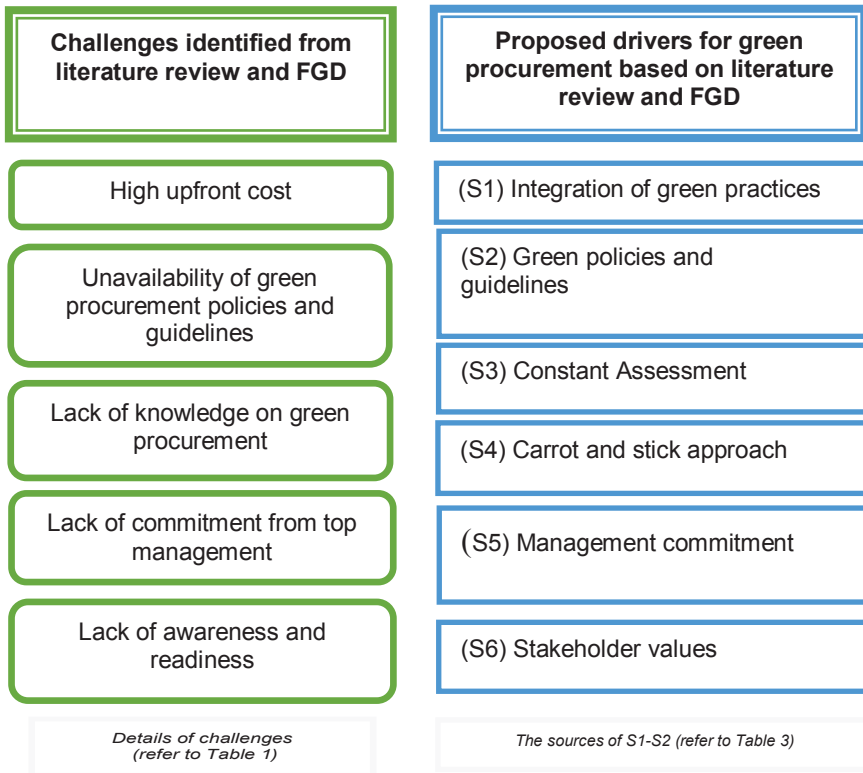

Figure 1: Proposed Drivers to Accelerate Green Procurement Implementation Based on the Outcome from the FGD

into six (6) main categories to enable extensive implementation of green procurement in construction projects. They are i) integration of green practices, ii) guidelines and policies, iii) constant assessment, iv) carrot and stick techniques v), management and corporate factor and stakeholder values as stipulated in the proposed conceptual framework in Figure 1.

Integration of Green Practices (S1)

The participants highlighted that it is important to integrate green practices into conventional procurement. As stated by participant P1:

> *"The need to inculcate green practices into Government Ministry of Finance circular. If the practices are not being enforced, there will be no changes happen in the industry" (P1)*

Companies play an important role in the existing procurement practices and integration of green procurement with the existing practices (Mosgaard, 2015). Albino et al. (2009) highlighted that benefits can be achieved from integrating environmental sustainability in terms of financially related issues, such as an efficient increase in the usage of resources, bigger sales, return on investment, and new market development.

The participants believed that to integrate green procurement into existing practices, the government should introduce a clear concept and urge industry players to implement it in their construction projects. Thus, the participants agreed on the first driver, which is the integration of green practices (S1). This will provide benefits from social, environmental, and economic aspects. However, most of the respondents agreed that green procurement is still new and at an early phase for the majority of practitioners in Malaysia.

The FGD participants agreed that the challenges in terms of cost can be minimized through the integration of green practices in the project procurement delivery. However, there are many other factors that can influence cost increases, such as the market demand and supply, as well as the location of the project.

Policies and Guidelines

The policies and regulations should be enacted and enunciated deliberately to guarantee the usage of green construction. The top-down methodology is required as a compelling key factor towards the usage of green purchasing in development (Ruparathna & Hewage, 2015). Bohari et al. (2017) believed in the significance of early instruction through institutional policies and guidelines at full scale and project levels to create a type of thinking that will control the detailing of rules at the project level. Quoted from the participants:

"To ensure the implementation of green procurement being adopted it is important that proper policy is given to the construction players who are involved in projects execution". (P2 and P4)

Moreover, policy guidelines play an important role in giving financial incentive and creating a tax incentive, in which the green construction can use to benefit the community. Thus, the government must have a policy on creating revenue streams for companies that are involved in green construction in terms of financial discounts, awards and subsidies, and many more (Shi et al., 2013). Referring to P1:

"*…Even though government provides the policies, if the market has no available alternative in terms of green practices, it will not help the industry". (P1)*

Furthermore, it is also highlighted by P6 and agreed by P1's statement that:

"...the existing policies are not enough yet to drive green procurement into broader aspect in construction project execution". (P1 and P6).

Therefore, awareness of green procurement and green practices among construction practitioners is important. Awareness will lead towards implementation. The participants agreed that the standard guidelines and policies are crucial to ensure the industry will implement green procurement practices. The changes in construction norms need to be gradually implemented. It will take time to bring in new practices and

replace existing ones. The strengths, weaknesses, opportunities, and threats of green practices need to be clearly highlighted in ensuring that construction practitioners will believe that the implementation will bring benefits in various aspects.

Constant Assessment

In the aspect of constant assessment, it has been highlighted that it is important to select products and services with reduced environmental impacts. The decision is to be made by the company or organization and this requires an assessment of environmental consequences for products as well as considering various aspects, such as cost of manufacturing and safeguarding raw materials, storage, transportation, handling and consumption, and disposal of products (Salam, 2008). The participants all agreed and as mentioned by one of the participants;

"It is important to investigate mechanism and how to do constant assessment. We have existing tools, such as Green Building Index and MyCrest, and it is good to adopt these tools as part of green procurement initiative." (P1)

Moreover, Varnäs et al. (2009) also mentioned the tools to be used throughout the stages of a project in order to identify environmental requirements. They include three (3) assessments, which are impact, risk, and life-cycle. In contrast, the environmental assessment of buildings consists of three (3) functions; they are promoting better green performance in buildings, offering information for decision makers during design, and providing the amount of impacts on the environment from the buildings (Cole, 2010).

As suggested by one of the participants, the assessment can be in terms of stakeholder certification and the terms stated in the contract.

"Moreover, the evaluation of the stakeholders, such as consultants and contractors also need to be taken into consideration because they need to be certified. This is to ensure that green will become a trend or culture in construction industry". (P4)

Similarly, Shi et al. (2013) believed that both assessment of building performance and green specifications are important tools to assess the technical sustainability of the whole building's life-cycle towards the final objective. The participants highlighted the importance of green specifications, benchmarking, and the effectiveness of green procurement practices as stated by the explanation:

"Benchmarking is important to ensure continuous improvement once things change differently." (P1)

Carrot and Stick Techniques

Carrot and stick techniques, such as rewards, recognition, short-course training, supporting and educating suppliers, and budget allocation are suggested to ensure the successful implementation of green procurement by stakeholders in the Malaysian construction industry. These techniques have been successfully implemented in other fields to ensure compliance. However, the carrot and stick techniques need to be supported with a strong fundamental knowledge among the industry stakeholders. Quoted from P6,

"*In Malaysia, stick approach is used by enforcement and still lacks approach. Capacity building to procurer has not reached satisfactory level.*" (P6)

All participants agreed that rewards and tax exemptions can be the carrot and stick approach to ensure the implementation of green procurement.

"*In other countries in Europe, the approach of green procurement implementation is a directive approach. Clear guidelines on minimum requirement must have Environmental Management System (EMS). All contractors must have EMS, if not, they cannot do the business. In terms of monitoring, transition period is given. Stick approach whereby the legislation.*" (P6)

Management Commitment

The role of the government is important in ensuring that green procurement concepts are being implemented by providing incentives, regulatory frameworks, and environmental standards. To achieve better results in the performance of green projects, commitment from the whole project team is important because it will be advantageous towards the outcome (Bohari et al., 2017).

"...Government plays major roles to ensure that the implementation of green procurement can be fully adopted in the industry." (P1)

Moreover, management support in terms of continuous valuation of green procurement is important to the current green procurement practices. It comprises a tradition of collaboration in department procurement, choices in purchasing, and significance in procurement processes (Mosgaard, Riisgaard, & Huulgaard, 2013). A participant also highlighted that;

"The driver to implement green procurement needs to be taken into consideration and this depends on the top management decision in order for this green procurement to be implemented." (P2)

All respondents agreed that politicians, ministers, government, private sector shareholders, and stakeholders have important roles, which can influence the organizations' decision to implement green procurement.

Stakeholder Values

In the construction context, green performance depends on stakeholder values, whereby their commitment indicates a huge impact on green performance (Wong, Chan, & Wadu, 2016). A study by Eskerod and Huemann (2013) shows that it is necessary to identify and manage the stakeholder values in sustainable construction as a future demand in green construction development. Stakeholder values, such as commitment, capability, and motivation are the important factors in ensuring a project's success.

Commitment also includes external stakeholders, such as the government and community. All the participants agreed that government commitment and support are very crucial to ensure that green objectives are fulfilled;

"Government needs to say as mandatory and enforcement." (P11)

"We need policy. Government needs to impose it as mandatory. If government says it, do it, everyone will follow." (P12)

Other than stakeholder commitment, the communication and nurturing the interest of all the team members including the suppliers and sub-contractors are crucially important. Thus, it is important to conduct continuous training and establish a medium to communicate the idea to the project stakeholders. This is as suggested by participant R7 that *"to ensure the readiness of industry, there must be series of training to upgrade the knowledge on green construction"*. The transition towards green construction demands that the organization has the capability in terms of technical knowledge on green practices.

Lack of knowledge in the green concept is one of the factors that contributes towards the resistance to implement green procurement in construction projects. Quoted from P5:

"Green concept is still new in the industry. It is important to start from early generation to create awareness on green practices because the industry will depend on them in the future. Local construction industry is still not mature in terms of green procurement implementation." (P5)

It is important to provide continuous training and knowledge sharing among the stakeholders in construction projects because their values are important in project delivery and outcomes. Moreover, this will help in terms of achieving the objectives of green projects. Sharing knowledge is important and the willingness to share expertise in green projects throughout their delivery is one way to create awareness and portray the capabilities of the stakeholders (Bohari et al., 2017). P1 agreed that providing training to construction stakeholders on green procurement is very important to ensure that their knowledge and awareness are at the

Table 4: Summary of the Challenges and Drivers of Green Procurement based on the FGD's participants

Challenges of Green Procurement	Drivers for Green Procurement	Focus Group Discussion (Local context)
High upfront cost	Integration of green practices Carrot and Stick approach	The participants believed that to integrate green procurement into existing practices, the government should introduce a clear concept and urge industry players to implement it in their construction projects. All participants agreed that rewards and tax exemptions can be the carrot and stick approach to ensure the implementation of green procurement in Malaysia.
Unavailability of Green Procurement Policies &Guidelines	Green policies and guidelines	The participants agreed that the standard guidelines and policies are crucial to ensure that the industry will implement green procurement practices. The changes in construction norms need to be gradually implemented.
Lack of knowledge on green procurement	Constant Assessment	The assessment can be in terms of stakeholder certification and the terms stated in the contract. The participants highlighted the importance of green specifications, benchmarking, and the effectiveness of green procurement practices.
Lack of commitment from top management	Management commitment	All respondents agreed that politicians, ministers, government, private sector shareholders, and stakeholders have important roles, which can influence the organizations' decision to implement green procurement.
Lack of awareness and readiness	Stakeholder Values	There are initiatives and commitments put in place to ensure the implementation of green practices, depends on the awareness, readiness to change, and enforcement by the construction practitioners and the government. Both parties need to collaborate.

highest level, thus ensuring successful implementation of green procurement. Furthermore, to give a clearer view on the aspects of green procurement, P4 also mentioned that research is being conducted to help contractors know and understand about green procurement, but it is still at the initial stage.

To ensure readiness when dealing with supply and demand, it is important to start at the minimum requirement to ensure a smooth adjustment or transition period. This will increase the suppliers' level of awareness on green practices. Both levels of readiness and practicality must be taken into consideration. The respondents agreed that the green concept is still new in the Malaysian construction industry. R6 supported R4 and mentioned that the level of awareness between construction stakeholders from East and West Malaysia is different. As stated by participant P6:

"Nowadays, people tend to see profit more than environment. This can be reflected with the level of awareness because people did not see the impacts of using certain materials and relate them with environmental aspect rather than giving them profit." (P6)

From the statements and comments by the respondents, it can be concluded that there are initiatives and commitments set in motion to ensure the implementation of green practices. However, it depends on the awareness, readiness to change, and enforcement by the construction practitioners and the government. Both parties need to collaborate in ensuring successful implementation of green practices in construction.

CONCLUSIONS AND RECOMMENDATIONS

Green procurement is regarded as an important tool in promoting green construction among construction players. In the era of globalization, it is expected that construction companies should have higher environmental awareness, which may result in a stronger drive and pressure for green practices. However, there are challenges identified that will slow down the process of promoting this new procurement approach. This paper highlights six (6) potential strategies to accelerate the process of adopting green procurement among practitioners, which are i) integration of green

practices, ii) guidelines and policies, iii) constant assessment, iv) carrot and stick techniques, v) management and corporate factor, and vi) stakeholder values.

The six strategies were derived from the review of existing literature and validated through the focus group discussion among experts. Experts in this paper refer to their knowledge and experience in green procurement and green construction. The conceptual framework of the drivers for green procurement in construction projects can be used as a basis to conduct an empirical study and further research.

This research can provide and contribute environmental management knowledge to construction practitioners towards greening the project and sustainability in terms of green procurement. Furthermore, this will help to create awareness and more knowledge on the potential of green procurement. This research will provide an overview of the current condition of green procurement in Malaysia.

The study's limitation is that in addition to being limited in resources, a greater number of further interviews are needed for future study. More evidence is needed to validate the points and suggestions made for improvement, possibly through another round of quantitative validation through a questionnaire survey. Also, the study is restricted to the construction industry alone, and hence, generalization to other types of organizations and projects with fundamentally different characteristics is limited at present.

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REFERENCES

Albino, V., Balice, A., & Dangelico, R. M. (2009). Environmental strategies and green product development: An overview on

sustainability-driven companies. *Business Strategy and the Environment*, *18*(2), 83-96.

AlNuaimi, B. K., & Khan, M. (2019). Public-sector green procurement in the United Arab Emirates: Innovation capability and commitment to change. *Journal of Cleaner Production, 233,* 482-489.

Bidin, Z. A., Bohari, A. A. M., Rais, S. L. A., & Saferi, M. M. (2019). A SWOT analysis of green procurement implementation in construction projects. In *IOP Conference Series: Earth and Environmental Science* (Vol. 385, No. 1, p. 012017). IOP Publishing.

Bohari, A. A. M. (2017). *Exploring the potential for green-oriented procurement in building projects: A case of the Malaysian construction industry* (Doctoral dissertation), Queensland University of Technology.

Bohari, A. A. M., Skitmore, M., Xia, B., & Zhang, X. (2016). Insights into the adoption of green construction in Malaysia: The drivers and challenges. *Environment-Behaviour Proceedings Journal, 1*(4), 45-53.

Bohari, A. A. M., Skitmore, M., Xia, B., & Teo, M. (2017). Green oriented procurement for building projects: Preliminary findings from Malaysia. *Journal of Cleaner Production*, *148*, 690-700.

Bratt, C., Hallstedt, S., Robèrt, K. H., Broman, G., & Oldmark, J. (2013). Assessment of criteria development for public procurement from a strategic sustainability perspective. *Journal of Cleaner Production*, *52*, 309-316.

Carmeli, A., & Tishler, A. (2004). The relationships between intangible organizational elements and organizational performance. *Strategic Management Journal*, *25*(13), 1257-1278.

Carter, C. R., & Dresner, M. (2001). Purchasing's role in environmental management: Cross -functio
Journal of Supply Chain Management, *37*(2), 12-27.

Chan, Y. H., Lee, B. C., & Lee, J. C. (2014). Sustainability in the construction industry in Malaysia: The challenges and breakthroughs. *Int. J. Soc. Behav. Edu. Econ. Bus. Ind. Eng*, *8*, 1218-1222.

Cole, R. J. (2005). Building environmental assessment methods: Redefining intentions and roles. *Building Research & Information, 33*(5), 455-467. doi: 10.1080/09613210500219063

Diabat, A., & Govindan, K. (2011). An analysis of the drivers affecting the implementation of green supply chain management. *Resources, Conservation and Recycling, 55*(6), 659-667.

El-Gohary, N. M., Osman, H., & El-Diraby, T. E. (2006). Stakeholder management for public private partnerships. *International Journal of Project Management*, *24*(7), 595-604.

Eskerod, P., & Huemann, M. (2013). Sustainable development and project stakeholder management: What standards say. *International Journal of Managing Projects in Business*, *6*(1), 36-50.

Ikau, R., & Joseph, C. (2017). Environmental legislation awareness among construction contractors in Malaysia. *International Journal of Service Management and Sustainability, 2* (2), 22-42.

Khan, M. W. A., Ting, N. H., Kuang, L. C., Darun, M. R., Mehfooz, U., & Khamidi, M. F. (2018). Green procurement in construction industry: A theoretical perspective of enablers and barriers. In *MATEC Web of Conferences* (Vol. 203, p. 02012). EDP Sciences.

Lafuente, R., & Sanchez, M. J. (2010). Defining and measuring environmental consciousness. *RevistaInternacional de Sociologia (RIS), 68*(3), 731-755.

Lam, P. T., Chan, E. H., Poon, C. S., Chau, C. K., & Chun, K. P. (2010). Factors affecting the implementation of green specifications in construction. *Journal of Environmental Management*, *91*(3), 654-661.

McMurray, A. J., Islam, M. M., Siwar, C., & Fien, J. (2014). Sustainable procurement in Malaysian organizations: Practices, barriers and opportunities. *Journal of Purchasing and Supply Management*, *20*(3), 195-207.

Mosgaard, M., Riisgaard, H., & Huulgaard, R. D. (2013). Greening non-product-related procurement–when policy meets reality. *Journal of Cleaner Production*, *39*, 137-145.

Mosgaard, M. A. (2015). Improving the practices of green procurement of minor items. *Journal of Cleaner Production*, *90*, 264-274.

Ogunsanya, O. A., Aigbavboa, C. O., Thwala, D. W., & Edwards, D. J. (2019). Barriers to sustainable procurement in the Nigerian construction industry: an exploratory factor analysis. *International Journal of Construction Management, 20*, 1-12.

Ojo, E., Mbowa, C., & Akinlabi, E. T. (2014). Barriers in implementing green supply chain management in construction industry. *International Conference on Industrial Engineering and Operations Management.*

Peprah, J. A., Brako, S., &Akosah, N. B. (2018). The awareness level of green procurement at the District Assemblies in Western Region in Ghana. *Journal of Management and Sustainability*, *8*(1), 46-58.

Pitt, M., Tucker, M., Riley, M., & Longden, J. (2009). Towards sustainable construction: Promotion and best practices. *Construction Innovation*, *9*(2), 201-224.

Preuss, L. (2007). Buying into our future: Sustainability initiatives in local government procurement. *Business Strategy and the Environment*, *16*(5), 354-365.

Preuss, L. (2009). Addressing sustainable development through public procurement: the case of local government. *Supply Chain Management: An International Journal*, *14*(3), 213–223.

Ruparathna, R., & Hewage, K. (2015). Sustainable procurement in the Canadian construction industry: Current practices, drivers and opportunities. *Journal of Cleaner Production*, *109*, 305-314.

Salam, M. A. (2008). An empirical investigation of the determinants of adoption of green procurement for successful green supply chain management. In *2008 4th IEEE International Conference on Management of Innovation and Technology* (pp. 1038–1043). IEEE.

Shelbourn, M., Bouchlaghem, D., Anumba, C., Carrillo, P., Khalfan, M., & Glass, J. (2006). Managing knowledge in the context of sustainable construction. *Journal of Information Technology in Construction*, *11*, 57-71.

Shi, Q., Zuo, J., Huang, R., Huang, J., & Pullen, S. (2013). Identifying the critical factors for green construction–an empirical study in China. *Habitat International*, *40*, 1-8.

Simion, C. P., Nicolescu, C., & Vrîncuț, M. (2019). Green procurement in Romanian construction projects. A cluster analysis of the barriers and enablers to green procurement in construction projects from the Bucharest-Ilfov Region of Romania. *Sustainability, 11*(22), 1-25.

Sourani, A. & Sohail, M. (2011). Barriers to addressing sustainable construction in public procurement strategies. *Proceedings of the Institution of Civil Engineers: Engineering Sustainability, 164*(4), 229-237.

Turner, R., & Zolin, R. (2012). Forecasting success on large projects: Developing reliable scales to predict multiple perspectives by multiple stakeholders over multiple time frames. *Project Management Journal*, *43*(5), 87-99.

Unit, E. P. (2015). Strengthening infrastructure to support economic expansion. Rancangan Malaysia Kesebelas (Eleventh Malaysia Plan): 2016-2020.

Varnäs, A., Balfors, B., & Faith-Ell, C. (2009). Environmental consideration in procurement of construction contracts: Current

practice, problems and opportunities in green procurement in the Swedish construction industry. *Journal of Cleaner Production*, *17*(13), 1214-1222.

Walker, H., Di Sisto, L., & McBain, D. (2008). Drivers and barriers to environmental supply chain management practices: Lessons from the public and private sectors. *Journal of Purchasing and Supply Management*, *14*(1), 69-85.

Willar, D., Waney, E. V. Y., Pangemanan, D. D. G., & Mait, R. E. G. (2020). Sustainable construction practices in the execution of infrastructure projects. *Smart and Sustainable Built Environment.* doi: https://doi.org/10.1108/SASBE-07-2019-0086

Wong, J. K. W., San Chan, J. K., & Wadu, M. J. (2016). Facilitating effective green procurement in construction projects: An empirical study of the enablers. *Journal of Cleaner Production*, *135*, 859-871.

Zsidisin, G. A., & Hendrick, T. E. (1998). Purchasing's involvement in environmental issues: A multi-country perspective. *Industrial Management & Data Systems*, *98*(7), 313-320.