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Green Procurement in Construction: Analysis of the Readiness Level and Key Catalyst among Construction Enablers

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Abstract: In the concern of sustainability and increasing awareness of environmental degradation, the Malaysian government has promoted numerous initiatives on green growth and green procurement (GP) to maintain and minimize the ecological effects in construction. However, this initiative is still in the infancy stage as to date, there is no specific guideline delineated to the construction industry, and it has yet to be enforced by the government to the construction practitioners. In construction, green procurement is a new area, and immediate actions are needed upon the principles, guidelines, and policy and implementation framework. Hence, this research aims to analyse the readiness level, barriers, and key catalysts among construction enablers towards adopting green procurement in the construction industry. Questionnaires were distributed to 102 construction enablers, focusing on quantity surveying firms in the Klang Valley area (Kuala Lumpur and Selangor), and 87 returned the responses. The analysis uses descriptive statistics via mean score, and the standard deviation was used to measure the variables and the mean's dispersion. It is revealed that the consultants are ready to adopt green procurement. However, GP's implementation's top challenges are lack of internal expertise, low awareness about green procurement, and lack of established best practices, standardized procedures and guidelines. It can be summarized that promoting GP and its implementation requires government support in policies, initiatives, and incentives. As the current practice is fragmented, ideally, GP's adoption in construction projects needs to conform to the acceptable standards that enable specific provisions to acquire eco-friendly sustainable construction.

Keywords: Green procurement, construction, readiness level, barriers, key catalyst

1. Introduction

Malaysia has gone through a very rapid construction and development phase with the emerging skyscraper buildings that have become common landmarks in the city's skylines. The arising development is parallel with the country's prompt initiatives that include construction of a mega project to generate more income for building owners. Construction industry is one of the key important drivers in stimulating Malaysia's economic growth to strive for high income developed nation, inclusiveness and sustainability by 2020. Over the last 30 years, it has formed a significant component of national Gross Domestic Product (GDP) and is expected to grow at 10.3% per annum with a contribution of RM327 billion (5.5%) to GDP for the next 2 years (EPU, 2015). The industry also provides about 1.2 million employment opportunities representing 9.5% of Malaysia's total workforce (CIDB, 2015). Although the development conveys a positive impact to the economic growth, it may constitute adverse impacts and consequences on the

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environment. According to Adham et al., (2012), the great socioeconomic development in Malaysia simultaneously contributes to large impact on the environment, directly and indirectly. Construction industry activities lead to greenhouse gas (GHS) and high carbon dioxide emissions, water pollution and also lead to high waste of materials to landfills. Concerns on the environmental adverse impact are significant to avoid destruction or damages of the natural resources.

Therefore, the Malaysian government has promoted the awareness of green growth and the concept of green procurement (GP) as a method to maintain and minimize the environmental effects. This plan refers to the purchase of products, services and related works in the public sector that take into account environmental criteria to conserve the environment and natural resources, and minimize and mitigate the negative impacts of human activities. Green procurement has existed in most developed countries such as German, United Kingdom, Japan and other European Union countries (Musa et al., 2013). In other countries, the green procurement enforcement by the government is called Green Government Procurement (GGP), a smart acquisition which means improving the efficiency of Government revenue while at the same time using the public market power to transform the Malaysian economy into the Green Economy (Kahlenborn et al., 2014). In Malaysia, sustainability concern in the green growth has been addressed in the Construction Industry Transformation Plan (CITP) 2016-2020, and one of the thrusts in this strategy is environmental sustainability. Other than that, the promotion of green procurement and green growth is also announced in the 11th Malaysia Plan (2016-2020) whereby one of the plans is focusing on the pursuance of green for sustainability and community resilience. The government has been serious in the highlights of green procurement as it was also shown in the National Green Technology Policy (NGTP) in 2009, that offered environmental-friendly and green products or services.

With all the agendas, the main aim and objectives of the government shall be fulfilled in minimizing the environmental issues caused by the construction industry. Malaysia's public and private agencies collaborated through many incentives in introducing several strategies to solve the environmental problems. The strategies include preserving the environment, such as utilizing resources, minimizing wastes efficiently and introducing policies to preserve the environment. The latest strategy outlined by the Malaysian government in addressing the environmental problems in Malaysia is the green procurement.

2. Green Procurement (GP) Issues in Malaysia's Construction Industry

Environmental degradation and the global impact issues have contributed to the increase in various stakeholders' interest in green procurement as it is able to emphasize particular attributes, such as recycled content, energy efficiency, and waste reduction. However, green procurement (GP) is still not well-reviewed and familiar among many organizations, firms or people in the sector of construction industry. Fischer (2010) argued that the GP's implementation and the success seem to be unclear even though the use of green procurement appears to be increasing globally. Several researches, (for example: Adham et al., 2012; Bohari & Xia, 2015; Musa et al., 2013) addressed the significance of GP in their research from the aspect of products, services, constructions and others. However, it is also highlighted that the establishment of GP is still lacking in terms of legal, policy, framework, and standard guidelines. This is also supported by Musa et al., (2013) that there is no issuance of standard guideline or framework that can be used by the procurement officers in applying GP practices in their firms.

In 2014, the Malaysian government has introduced a guideline for government procurers through the Ministry of Energy and Natural Resources (KeTSA) or previously known as KeTTHA and Malaysia Green Technology and Climate Change Centre (MGTC). The government green procurement (GGP) guideline in 2014 was established as the first government green procurement and the purchasing is delineated to six (6) green products and services including cleaning services, ICT equipment, energy efficiency (EE) indoor lighting, paper, paints, and fibre cement (Kahlenborn et al., 2014). The GGP guideline is improvised through its latest issuance in the year 2018, where 20 products were incorporated (as shown in Figure 1) instead of 6 products in 2014. Although the Malaysia's GGP guideline was established as the first government green procurement, it covers only the products and facilities for government buildings and does not cover the construction sectors comprehensively. In other words, the established GGP guideline does not address stages and activities in the construction sectors which include inception, design, construction, occupancy and demolition phase.

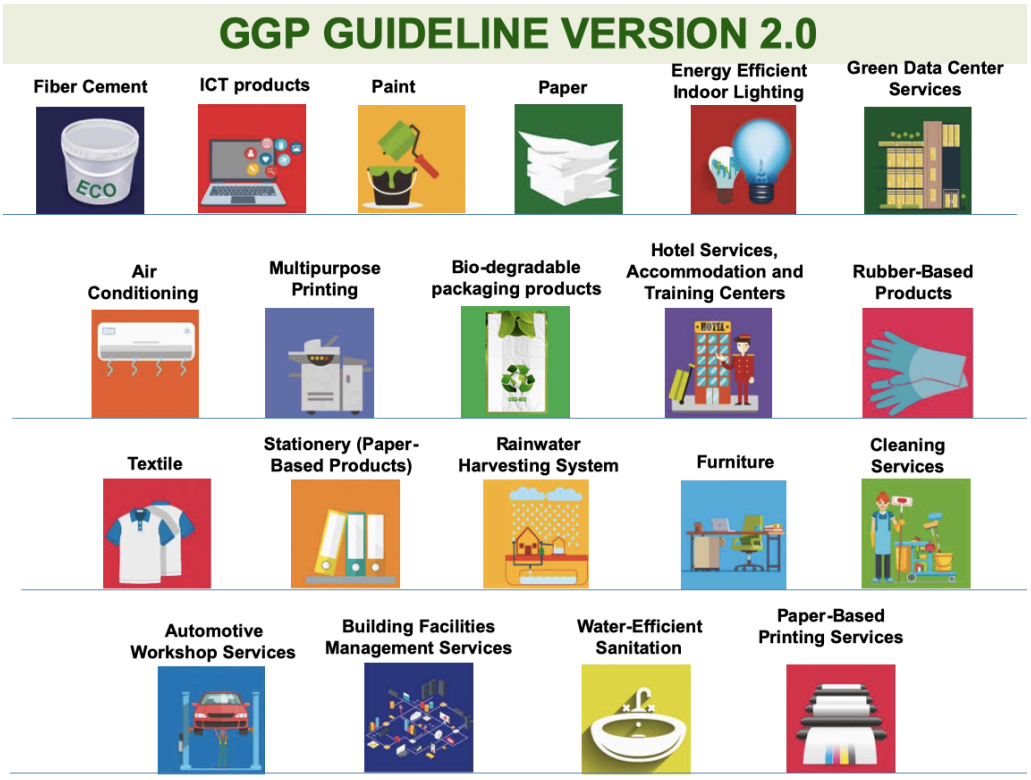

Fig. 1 - Listed products and services under government green procurement (GGP) guideline 2.0 (KeTTHA, 2018)

As debated by Bohari et al., (2017), implementing green procurement has become an exacting issue due to lack of knowledge on the determinants and development of environmental criteria. This is also supported by other researchers such as Fischer (2010), Kahlenborn et al., (2014) and Buniamin et al., (2016) that revealed the vital need to acknowledge the environmental parameters in pre-construction, construction and post-construction phases. This clearly shows that green procurement is still not favourable and many still depend on the traditional or general procurement. In the inception stage of construction, deciding procurement option is inevitably crucial to determine the client's strategy in achieving the objectives of the construction. Procurement is the key decision in the initial stage which it acts as powerful agent of changing and also having important multi-dimensional tools capable of integrating green practices throughout the construction process (Bohari et al., 2017).

Other than that, there is an unclear allocation of environmental criteria in the tender as it is not well-defined (Bouwer et al., 2005). Tender document is prepared by the quantity surveyor as an initial part of contract document between two parties. It contains several crucial sections including tenderer's instruction, specification and Bills of Quantities. Tender document is also prepared as an offer of invitation to the potential contractors to provide reasonable price of project. Ideally, the project's aim may differ if the tender is not prepared in accordance to the client's decision. Hence, this issue of GP's implementation during pre-construction is also related to the lack of training and knowledge capability (Bouwer et al., 2005). Based on the analytical review on the precedent researchers relating to GP in construction, the issues and challenges in GP's implementation is summarized using cross-case analysis as shown in Table 1.

Table 1 - Summary of cross-case analysis on the issues and challenges of GP's implementation

No.	Description of Issues and Challenges	Source(s)
1	Lack of confidence in carrying out the GP plans	Sanchez (2014); KeTTHA (2009)
2	Lack of established best practices, standard procedures, guidelines and policy	Sanchez (2014); Bouwer et al., (2005); Fischer (2010); Zhu (2013); KeTTHA (2009); Ojo et al., (2014); Green Council (2010); Adham et al., (2012); Qiao and Wang (2011); Geng and Doberstein (2008); Bohari et al (2017)
3	Scarcity of environmental criteria in design and contractor's selection	Sanchez (2014)
4	Lack of monitoring, control, and review methods	Sanchez (2014)
5	Lack of knowledge about the GP	Bouwer et al., (2005); Fischer (2010); Zhu (2013); Ojo, et al., (2014); Green Council (2010); Qiao and Wang (2011); Geng and Doberstein (2008); Bohari et al (2017)
6	Higher cost of green products	Bouwer et al., (2005); Fischer (2010); Zhu (2013); KeTTHA (2009); Green Council (2010); Adham, et al., (2012); Qiao and Wang (2011); Jaafar, et al,, (2016); Geng and Doberstein (2008); Bohari et al (2017)
7	Market uncertainties or technical uncertainties	Fischer (2010)
8	Lack of financial and sources of fund	Bouwer et al., (2005); Fischer (2010); Zhu (2013); KeTTHA (2009); Green Council (2010); Adham, et al., (2012); Qiao and Wang (2011); Jaafar et al,, (2016); Geng and Doberstein (2008); Bohari et al (2017)
9	Lack of internal expertise	Zhu (2013); KeTTHA (2009)
10	Lack of green materials or products in local market	KeTTHA (2009)
11	Lack of innovative financing on green projects due to possibility of risk occurence	KeTTHA (2009)
12	Poor awareness on green procurement	Ojo, et al., (2014); Adham et al., (2012); Geng and Doberstein (2008)
13	Insufficient cooperation with academia and environmental organisations	Oio (2014)
14	Poor commitment by top management	Sanchez (2014); Ojo et al., (2014); Jaafar et al,, (2016)
15	Negative perceptions on the quality of eco-friendly products and services	Adham et al., (2012)

Consequently, the analysis on the above issues has become major challenges for both government and private agencies on green procurement programs. If the industry is ready to implement GP for construction, there is a need to determine the possible strategies to overcome the challenges, especially for construction enablers. Therefore, this study is aimed to investigate the level of readiness among construction enablers towards the adoption of GP in the construction industry. In fact, the identification is needed in determining the rationale of GP for the construction industry. Hence, it requires determinants of the barriers faced by the industry and construction enablers as well as determinants on the key catalyst to promote GP in the construction industry.

3. The Review of Green Procurement's Implementation: Readiness Level, Barriers and Key Catalysts

Procurement in construction influences the overall performance of the project. This is also supported by Valdes-Vasquez (2011) where procurement is the key that contributes to the overall success of a project . It is important for all types of construction project either building or infrastructure. Procurement of construction projects is very complex and unique. The result from the online survey by RIBA reveals that the most common procurement that have been used are traditional, design and build, management contract and private finance initiative (RIBA, 2013). The selection of procurement method depends on the client's preference and the suitability of the type of project. According to Fischer (2011), there are plethora of terms on Green Procurement (GP) that include environmentally preferable, sustainable, affirmative, and socially responsible procurement. Hence, the description of GP is not based on a single source of

definition. Smith and Terman (2016) defined GP as the process of selecting products or services that have a lesser or reduced effect on human's health and the environment when comparing them to other competing products or services that serve the same purpose. Meanwhile, Malaysian Green Technology Corporation (2017) has defined Government Green Procurement (GGP) as "..the acquisition of products, services and work in the public sector that takes into account environmental criteria and standards to conserve the natural environment and resources, which minimises and reduces the negative impacts of human activities".

When applied in tenders, GP can increase market demand for environmental products and services and stimulate eco-innovation. The importance of GP is widely highlighted and when the system needs to be enhanced or established, ideally, readiness on the implementation needs to be addressed by the stakeholders. Readiness is to be a major factor in determining whether a Green Procurement program can be effectively implemented and supported by the construction players. It is depicted as the willingness and the ability to do or adopt something. Psychologists and sociologists commonly employ four concepts in order to measure readiness levels which are attitude, values, opinion, and belief. Readiness also refers to the environment within which an individual or institution has been prepared for a new thing (Othman et al., 2012). However, to make it into realization, the implementation drivers are needed to promote its reliability and rationale on why it is needed for construction, in the first place. On this basis, the success in adopting GP depends on the readiness, willingness and the ability of the construction industry players. Psychologists and sociologists commonly employ four concepts to measure readiness level: attitude, values, opinion, and belief. According to Houston et al., (2002), readiness can be divide into two domains, cognitive and non-cognitive. "Cognitive domain" refers to the knowledge and skills that a person requires, while the "non-cognitive domain" related to motivation, integrity, and interpersonal interaction. Attitude is a crucial element if a person or institution is to achieve something. It is an essential support for the development of willingness to adopt green procurement. If the attitude is negative, the willingness to use green procurement will not exist. That means the readiness to adopt green procurement will not happen and, consequently, leads to a failure to create procurement that concerns the environment.

To address the issues and challenges of GP in construction, several key drivers were analysed from various literature to ensure that Green Procurement (GP) can be successfully implemented. Adham et al., (2012) in their findings highlighted that strategies and drivers to promote GP includes policies provision by the government, emergence of legislative frameworks and regulations on GP. Legislation and rules play an important role in driving an organization to carry out environmental action (Fischer 2010; Adham et al., 2012; Zhu et al., 2013) , unfortunately Malaysia has yet to have policies, legislative and regulatory frameworks on GP. Other than that, providing incentives and financial assistance, subsidies and tax incentives to industry are needed to produce more productive and environmentally friendly products and services (Adham et al., 2012; Adham et al., 2015). To increase greater awareness on GP, both government and private agencies should provide more campaigns, workshops and promotions that are able to disseminate awareness and involvement of the industry (Adham et al., 2012; Adham et al., 2015; Zhu et al., 2013; Testa et al., 2016; Bohari et al., 2017; Musa et al., 2013). Moreover, the strategies could not be a one-time off process and persistent supports from relevant agencies and stakeholders are vitally needed. Specific provisions for the acquisition of eco-friendly products and services are crucial and fragmentation issues should be minimized by improving integration between agencies (Adham, et al., 2012). Based on the highlighted issues and the listed strategies as key catalyst to implement GP in construction, it has to be tested among construction enablers in Malaysia to seek whether the industry is ready to accept "green" for the construction procurement.

4. Methodology

Enabler refers to the organisation that facilitates, regulates and promotes the success implementation of GP that includes policy makers, regulators and consultants. Due to a large population of construction enablers in Malaysia, this study has limited the scope of research, focusing on the consultant firms practicing quantity surveying services. Quantity surveyors are responsible to prepare procurement and tender documentations in pre-construction. Hence, it is rationale to attain their feedbacks as the roles of quantity surveyors are vital in the inception phase of construction until the construction reaches the end of life cycle stage. The sample was drawn based on purposive sampling method where the respondents are chosen based on the purpose of the survey. Questionnaires were distributed to the quantity surveyors' firms in Kuala Lumpur. As extracted from the website of to Board of Quantity Surveyors Malaysia (BQSM, 2018), the current total number of registered quantity surveyors' firms in Kuala Lumpur is 102. Kuala Lumpur is chosen as the region since it represents the highest population of quantity surveyors' firms registered with BQSM. Based on the total population, a set of 102 questionnaires were distributed to the quantity surveying firms. Out of 102, 87 questionnaires were returned which resulted in 85% of response rate.

5. Findings and Analysis of Data

Before proceeding with the survey, a pilot study was carried out in order to test the reliability of the questionnaires. According to Hertzog (2008), a reliability test is sufficient if it involves at least 10% of total respondents in a survey. Since the questionnaires were distributed to 102 firms, the reliability test was carried out to 10 consultant firms as the respondents use Cronbach's coefficient alpha test. Table 3 shows the sections contained in the questionnaire and the

result of reliability test using Cronbach alpha score. As shown in Table 2, the alpha value for 33 items stipulated in the questionnaire is .996. Thus, all questions received coefficient alpha values above 0.7, which indicates good reliability. As supported by Hair et al., (2006), an alpha value which exceeds 0.70, indicates that the instrument has sufficiently good reliability or internal consistency. Therefore, the result of the reliability test is that all the variables demonstrate internal consistency and the main survey could be carried out on all respondents.

Table 2 - The result of reliability analysis using Cronbach's Alpha

Cronbach's Alpha	N of Items
.996	33

General demographic data were compiled from the participants, which includes their working experience and their current designation at the respective organisation. Table 3 presents the summary of the participants' demographic background. A majority of the participants which represent 50.6% of total respondents are designated as contract managers. It is followed by 33.3%% respondents in the position of contract executives, 10.3% associates and 5.8% principle directors. This majority affirmed that their working experience is between 6 to 10 years in the field. It is found that 40.2% of the respondents have experience in the involvement of green project and the remaining 59.8% respondents have no experience in green project's involvement.

Table 3 - Demographic result of the respondents

Demographic	Items	Frequency (n)	Percentage
Gender	Male	48	55.2%
	Female	39	44.8%
Designation	Principle/Director	5	5.8%
	Associate	9	10.3%
	Contract Manager/Superior	44	50.6%
	Contract Executive	29	33.3%
Working experience	More than 15 years	4	4.6%
	11 to 15 years	6	6.9%
	6 to 10 years	53	60.9%
	Less than 5 years	24	27.6%
Involvement in green project	Yes	35	40.2%
	No	52	59.8%

5.1 Level of Readiness and Challenges on the Adoption of Green Procurement for Construction

The analysis on the result of readiness level, challenges and key catalyst to adopt GP in construction was calculated based on five (5) numerical Likert-scale: 1–Strongly disagree; 2–Disagree; 3–Average; 4–Agree; 5–Strongly Agree. Hence, descriptive statistical analysis using mean score and standard deviation were used to measure the criteria and mean rank to convey information about distributions in a concise way. Table 4 and 5 showed the result of the readiness level and challenges of the respondents on the adoption of GP in construction.

As shown in Table 4, the mean values of all readiness criteria range from the highest mean (4.02) to the lowest mean (2.48). The standard deviation (*sd*) value shows a smaller dispersion on the distribution of data and the obtained *sd* score is less than the mean, ranging from 0.833 to 0.973. The standard deviation indicates that the ratings are consistent among all respondents (87 respondents); hence, the data are considered reliable. It was found that the respondents are ready to adopt the green procurement (mean score =3.77). They are ready to adopt green procurement concept in all construction stage, produce tender and contract document on GP, adopt existing policies related to GP, ready to add knowledge and skills related to green procurement and top management is ready to give commitment to implement GP. However, the mean score shows a lower level of readiness (mean score=2.48) which refers to the respondents' readiness on financial expenses to implement GP.

Table 4 - Mean Rank of the Readiness Level to the adoption of GP in construction

Criteria of Readiness	Mean	Std. Deviation (*sd*)
Our organisation is ready to add knowledge and skills related to green procurement.	4.02	0.833
Our top management is ready to give commitment and implement GP.	3.99	0.933
Our organisation is ready to integrate environmental criteria in decision making stage especially during preparation on bill of quantities (BQ)	3.87	0.973
Our organisation is ready to adopt green practices and procurement in all construction stages.	3.77	0.906
Our organisation is ready to adopt existing policies related to GP.	3.67	0.948
Our organisation is ready to produce green-oriented procurement documentation.	3.64	0.889
Our organisation is ready to accept financial impact upon implementing GP in the construction industry.	2.48	0.874

The result on the challenges of GP's implementation is shown in Table 5, where the mean values of all readiness criteria range from the highest mean (4.08) to the lowest mean (3.31). A small dispersion of standard deviation (*sd*) value on the data distribution is shown in the range from 0.723 to 0.970 which indicates that they are consistent. From the result, the respondents agreed that the main challenges in adopting GP for construction is lack of internal expertise in green procurement particularly. It is then followed by challenges in terms of poor awareness on green procurement, lack of established best practices, standardized procedures and established guidelines and policy.

Table 5 - Mean Rank of the Challenges to the adoption of GP in construction

Criteria of Challenges	Mean	Std. Deviation (*sd*)
Lack of internal expertise.	4.08	0.750
Poor awareness on green procurement.	3.99	0.739
Lack of established best practices, standard procedures, guidelines and policy.	3.92	0.852
Lack of knowledge and capabilities to implement GP.	3.91	0.787
Scarcity of environmental criteria in design and contractors' selection.	3.87	0.759
Insufficient cooperation with academia and environmental organizations.	3.79	0.779
Market and technical uncertainties.	3.78	0.855
Lack of innovative financing on green projects due to possibility of risk occurrence.	3.77	0.845
Higher cost of green products	3.77	0.773
Lack of green materials or products in local market.	3.75	0.838
Fragmented issues on the existing environmental criteria and tools	3.72	0.802
Poor commitment by top management.	3.68	0.723
Lack of confident in carrying out the GP plans	3.60	0.842
Negative perceptions about the quality of eco-friendly products and services.	3.40	0.970
Lacking of monitoring, control, and review methods.	3.31	0.906

5.2 Key Catalyst to Promote GP in the Construction Industry

In general, the survey finds a number of important key catalyst as compiled from the literature analysis, that need to be put in place in order promote GP in construction industry. Table 6 shows the mean score on the agreement level of the respondents, with regards to the listed criteria of drivers. The data is tabulated in accordance to top rank with the highest mean (4.03) to the lowest rank (mean=3.54). The obtained *sd* score is less than the mean which ranges from 0.655 to 1.048. The standard deviation (*sd*) value shows a smaller dispersion on the distribution of data, thus, indicates that the ratings are consistent among all respondents. From the data analysis and finding, the highest rank of key driver

to promote GP is commitment and strong support from the government in the form of policies, initiatives and incentives that support the implementation of GP (mean=4.03). It is then followed by providing specific provisions for the acquisition of eco-friendly products and services and increasing campaign on media; both are included in the top three (3) ranked of survey ratings.

Table 6 - Mean rank of the key catalyst to promote GP in the construction industry

Criteria of Key Catalyst / Drivers	Mean	Std. Deviation (*sd*)
Commitment and strong support of the government in the form of policies, initiatives and incentives that support the implementation of GP	4.03	0.655
Provide specific provisions for the acquisition of eco-friendly products and services.	3.89	0.763
Increase promotion and campaign on media.	3.83	0.795
Top management action.	3.79	0.779
Providing policies, legislative frameworks and regulations on GP.	3.77	0.758
Organize GP workshops for all parties involved in construction.	3.69	0.867
Monitoring, evaluation and reporting systems (including targets and implementation mechanism to measure GP progress).	3.64	0.902
Improve integration between agencies.	3.63	0.837
Implement building capacity programs to enhance knowledge and skills.	3.62	1.048
Availability of green products and services as well as GP instruments.	3.54	0.974

6. Discussion of Results

The results show the readiness level, challenges, and key catalysts were constituted from the respondents' different perspectives. It was agreed that the enablers are ready to adopt GP in construction. However, the agreement survey on the challenges showed that the respondents' lack of internal expertise was ranked as the top barrier. This result is parallel to the study concluded by Bohari & Xia, (2015), ICLEI European Secretariat (2007), KeTTHA (2009), Michelsen and de Boer (2009) and Zhu et al. (2013), that have similarly highlighted this issue. Expertise can be defined as having a broader experience and a high level of skills in any field. Larsson and Cole (2001) supported that the value of an expert's knowledge is also recognized as an opportunity. In this case, lack of internal expertise has become the primary barrier because generally, the construction enablers have little experience with green procurement and they are not environmental experts. The next challenge is having poor awareness about green procurement, which is paralleled with conclusions drawn by by Adham, et al., (2012), Bohari & Xia, (2015), Geng and Doberstein, (2008) and Ojo et al, (2014). The main reason for poor awareness about green procurement is the lack of sensitivity towards environmental problems and less promotion on green procurement as a tool to minimize the environmental impact. ICLEI European Secretariat (2007) also stated that poor awareness might be because of a lack of seminars and in-house newsletters on green procurement. The deficiency of established best practices, standardised procedures and guidelines or policy was ranked as the third rank of challenges faced by the construction enablers. There is still no specific guideline or framework that can be followed by the construction player (Adham, et al., 2012; Bouwer et al., 2005; Fischer, 2010; Geng & Doberstein, 2008; Green Council, 2010; Musa et al., 2013; Ojo et al., 2014; Qiao & Wang, 2011; Sanchez et al., 2014). It is undefined that problems encountered when setting up the planned procedures. Besides, any problems in obtaining the desired results need to be remedied immediately (Kahlenborn, et al., 2014).

Hence, capacity plans are needed as key catalyst to promote GP's implementation in construction. Building capacity is the process to improve and retain the skills and knowledge. It also refers to strengthening the skills, competencies and abilities of people and communities. As supported by Yang et al. (2015), green technology's key drivers should uptake and quality assurance that will enable the system to achieve sustainability goals. The result shows robust commitment and support from the government and implementation agencies are needed in policies, initiatives, and incentives as a key catalyst. According to Adham et al., (2012), our government is serious toward adopting green procurement whereby they have provided the initiatives to support GP's implementation. It includes providing financial assisting schemes through the Green Technology Financing Scheme (GTFS), Malaysia Green Procurement Program (MGPP), Malaysia Green Labeling Program (MGLP) and MyHIJAU Directory demand for eco-friendly products and services is increased if specific provisions are mandated. It will also attract others to invest at the eco-friendly products and services; thus, establishing a larger and newer market for innovative sustainability solutions.

Steering committees between the integration of agencies are also needed to increase promotion and campaign on GP for construction. It was also raised by precedent researchers (for example: Adham et al., 2012; Adham, et al., 2015; Bohari et al., 2017; Musa et al., 2013; Zhu, et al., 2013). There are many agencies involved to make sure green

procurement can be successfully implemented in Malaysia. The Ministry of Finance (MOF), Ministry of Energy and Natural Resources (KeTSA), The Ministry of Enviroment & Water (KASA), the Ministry of Urban Wellbeing, Housing and Local Government (KPKT) and the Economic Planning Unit (EPU) were the main agencies that are responsible for the plan. According to KeTTHA (2018), GP's implementation is extended to 12 selected ministries and agencies in 2016; and 2017 it had been further expanded to all Government ministries and agencies. Currently, the guideline of GGP for products is extended to 40 products and services, which will be established in the year 2020 for 20 government ministries. In Malaysia, the GGP guideline for products, services, and works is allocated under the national plan aligned to UN Sustainable Development Goals in the SCP-GGP Project. Technical working committees from various ministries were involved in the SCP-GGP project funded under the United Nations Development Program (UNDP). Hence, it is crucial to gain all parties' cooperation to ensure the success of the green procurement.

Apart from that, green procurement implementation should also focus on the policies and governance in adopting green procurement for the construction industry. A robust legal framework and a thorough regular review play a vital role in GP's successful functioning. The policy is defined as the government's direction in achieving specific performance (Li & Ken, 2005). While the legal framework refers to the rules, rights, and obligations of companies, governments, and citizens are outlined in legal documents. Undoubtedly, GP in construction works cannot be implemented when the legal framework impedes the concept's application. Once the policy on the green products and services and green procurement instruments are available, the challenges of lack in the material can be solved, and GP can be encouraged and enforced entirely.

7. Conclusion

With the increasing problems of environment, the effectiveness of the green procurement is crucially needed. GP is able to play roles in the mitigation on the environmental adverse impact from construction activities which leads to sustainability throughout construction supply chain. Throughout its life cycle, building gives significant contribution to global GHG emissions, pollution and waste management issues. Today more than ever, buildings have tremendous impact on the environment both during construction and operation and it has raised the growing concerns regarding construction industry locally and globally. This study provides insights regarding the level of readiness on GP in the Malaysia's construction industry, and reveals the challenges on the GP's adoption in construction and the required key drivers for implementing GGP. Ideally, GP should be looked as a whole system and the rating tool provided points for procuring energy efficient products as well as optimizing performance and building sustainability. It is hoped that this study would be a starting point to continue the agenda on establishing green procurement for Malaysian construction industry and producing further strategic implementation plans.

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