A S.W.O.T. Analysis of Green Procurement Implementation in Construction Projects

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Abstract. Green-related practices are widely implemented in various countries to ensure that problems related to the environment can be reduced. The concept of green-related practices and strategies were introduced and identified in providing the green procurement can be fully implemented in the Malaysian construction project. Green procurement concept is presented as one of the initiatives to support in reducing environmental issues throughout construction execution. Hence, this paper focuses on analysing the strengths and weaknesses of green procurement as well presented the opportunities and threats towards construction. Focus group discussion was conducted among green expert's participant who shares their experiences and point of views related to green procurement. The outcomes of this research findings offer plans and a clearer picture for practitioners in implementing green procurement practices in construction execution.

1. Introduction

Construction activities give significant impacts on the environment, social and economics. There are some significant issues related to construction activities such as pollution, degradation of natural resources and carbon footprint [1]. Hence, there are some initiatives to ensure these environmental problems can be conserved and minimised [2]. The introduction of green-related practices has been widely endorsed to alleviate these issues.

The Malaysian government has encouraged construction stakeholders to implement green procurement approach to help and ensure that the project execution is being greened [1]. Green procurement was introduced under the National Green Technology Policy 2009 as one of the strategies to conserve the environment [3]. Malaysia is one of the developing countries that are rapidly building physical development to cater to facilities such as building and infrastructure for communities, and these activities will contribute toward indoor and outdoor environmental pollution [1]. As the green procurement concept is still very new in the Malaysian construction industry, it is crucial to address this towards the construction stakeholders to ensure they implement it to procure green construction projects [1].

Procurement is one of the essential elements in managing the construction project. Sustainability in the project life cycle is crucial in ensuring environment impact can be minimised. However, there are issues in the current procurement practices that disregard project lifecycle sustainability. [4] To help and manage environmental issues, green procurement is introduced as useful tools. Implementing green procurement means construction stakeholders need to ensure that environmental problems can be minimised from the initial towards the completion of construction activities [1]. The objective of this paper to identify strength, weaknesses, opportunities and threats of green procurement practices.
using SWOT analysis and assessed green’s perceptions on these matters in the local context of the Malaysian construction industry.

2. Green Procurement

There is several authors’ defined green procurement as an effective way of purchasing products or services that can minimise and reduce environmental impacts. Moreover, [5] mentioned that green procurement is a process of purchasing products, works and services which the process is interrelated with environmental factors. According to [6], green procurement is a process of assessing the purchasing products at lifecycle stages and its environmental effect from purchasing raw materials, transporting, handling, manufacturing, storage, consumptions and disposals. This is also supported by [7], green procurement is the process at the lifecycle stages. Apart from that [8] mentioned that it is essential to select and set the environmental requirements in the contract. Several green procurement initiatives have been introduced such as LEEDS certification that focuses on the standards of energy use, toxic material specifications, recycle of material, works safety procedures and social benefits [4]. [14] mentioned that green procurement capable in giving benefits towards environment. The implementation of green procurement can increase more demand for terms of green products, materials and services. Moreover, in Malaysia, MyHijau were introduced under the Ministry of Energy, Green Technology and Water (KeTTHA) to reassure green technology and green purchasing were implemented in construction projects in Malaysia [1]. According to [9], Eco-labels is essential tools to promote sustainable procurement, and it is crucial to strengthen green project management knowledge among construction project stakeholders [10].

3. Methodology

3.1 Research design

A comprehensive literature review was commenced to gather data on green procurement, the challenges and success factors of green procurement in construction projects. Data and information from the literature review were used to support the primary findings. A focus group discussion (FGD) was conducted with green experts to validate the objectives of this paper and to obtain a better knowledge of green procurement in Malaysia. The discussions were structured according to the themes using research questions prepared in advance before the discussions started and questions for the session were given to the moderator as guidelines.

3.2 Expert discussion

Expert group discussion was conducted to validate and obtain useful insights and knowledge of green procurement practices in the construction industry. Selection of green experts' participants was based on their rich experience and background in green procurement practices in the construction industry. A total of 18 participants in the focus group and they were among experts and academicians. Focus group discussion (FGD) approach was used to collect qualitative data for this research.

3.2.1 Arrangements of FGD

- **Invitations** – Construction companies and academicians who involved in green construction and experts on green procurement was contacted in advance, and they were explained about the discussion for the FGD. Invitation letters were sent to each participant that agreed to join the FGD.

- **Venue** - The FGD was conducted at Dewan Perpaduan III 1st Floor, Merdeka Palace Kuching on 6th February 2018. Duration of the event took place at 2:00 pm – 5:00 pm.

- **Sharing session** – A brief sharing session by Dr Khairul Naim bin Adhar on Green Construction Projects through Construction Procurement before the breakout sessions started.
• **Group Discussion composition** – The FGD were conducted using face to face discussion consisting of a group of green experts and academician. Each participant was assigned according to the themes of the discussion. The themes include the challenges and success factors of green procurement in construction projects. A brief introduction, purpose and scope of the FGD are explained to the participants, and they were asked to give a short introduction and background about themselves. All participants are given a chance to participate during the discussion and discussed relevant topics according to the themes. The discussion was led by one main moderator to ensure the discussion run smoothly and steer the in-depth topic of discussion with the participants.

• **Seating arrangements** – Circular seating arrangement was set to ensure clear interaction among participants and each participant provided with table name tags to enable moderator and rapporteur recognise the participants.

• **Recording and note-taking** - A rapporteur was assigned to take extensive notes during the discussion, and the discussion was audio recorded. All the input gathered will be further analysed. The session of the FDG lasted for 50 -60 minutes to complete. All participants were informed that all responses and discussion were kept strictly confidential which only be used for research purposes only. All transcribed audio record will be kept anonymously, and the final discussion results were then emailed to the participants.

• **Light refreshments, gifts, and photo session** – Light refreshments and gifts for the participant were given as a token of appreciation for willingness to spend their time to participate in the FGD and group photo session was taken after the discussion.

3.3 **SWOT Approach**
SWOT (Strength, Weakness, Opportunities, Threats) analysis is a technique that widely used to conduct a strategic study. A detailed SWOT approach was conducted to attain the understanding of the strength of green procurement, the characteristic of green procurement and the benefits of green procurement in construction project execution. Moreover, the drawbacks of green procurement were further identified and what can be improved. The changes in government policy, trends in construction-related with green procurement and the challenges of green procurement in construction project were further analysed using the SWOT approach.

4. **Analysis and Findings**
4.1 **SWOT analysis**
Different authors highlighted that based on countries that implement green procurement, green procurement could minimise environmental damages, less waste, less energy consumption, financial and environmental of construction can be improved, reduce pollution, raised awareness among staff on green practices and policies as well as improve company's positive image. Supply chain networks also can be enhanced.
Table 1. SWOT analysis by different authors.

| Ref. | Authors                                                                 | Strength                                                                                   |
|------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| 1.   | ICLEI European Secretariat, 2007, Green Council 2010; Varnas et al., 2009, Hutchison, 1998; Salam, 2008; Cruz and Wakolbinger, 2008; European Commission, 2011; Hutchison, 1998 | • Less energy consumption products,                                                        |
|      |                                                                         | • Less waste                                                                               |
|      |                                                                         | • Lower carbon footprints                                                                  |
|      |                                                                         | • Minimise environmental damages                                                           |
|      |                                                                         | • Environment and financial performance of construction and building process can be improved.|
|      |                                                                         | • Reduce pollution, reduce environmental handling costs.                                   |
|      |                                                                         | • Raised and increased staff awareness and knowledge of green practices and green policies.|
|      |                                                                         | • Improve the company's positive public image (corporate market competitiveness)            |
|      |                                                                         | • Supply chain networks can be enhanced, transaction costs, risks and emissions can be reduced.|
|      | Essa & Fortune, 2008                                                   | • Lack of knowledge (social sustainability factors)                                         |
| 2.   | Carter and Fortune, 2007                                               | • Lack of structured frameworks (assists project teams)                                    |
|      | Faith-Ell et al., 2006                                                 | • Lack of information and the inability to supervise after contract award. (intimidating tasks of practical implementation of environmental criteria) |
| 4.   | Sourani and Sohail, 2011; Walker and Hampson, 2008; Ruparathna and Hewage, 2015 | • Lack of funding, lack of awareness, lack of research and development, lack of understanding, information, commitment, and demand, insufficient policies, |
regulations, incentives and lack of leadership

| Ref. | Authors | Opportunities |
|------|---------|---------------|
| 1.   | Green Council, 2010 | • Increased and create business opportunities with international investors |
| 2.   | Office of the Auditor General Canada, 2005 | • Build green procurement expertise, expands tools and set requirements. |

| Ref. | Authors | Threats |
|------|---------|---------|
| 1.   | Pitt, M., Tucker, M., Riley, M., & Longden, J., 2009; Shiers et al., 2006 | • Lack of client demand |
|      |         | • Reluctance in contractor |

As gathered through extensive literature review, these statements were further validated through focus group discussion that has been conducted. The focus group discussion data were analysed by transcribing focus group comments. Analysing the transcripts and then identify responses that relevant to the questions asked. The answers of the participants were themes and categories according to the research questions. SWOT analysis and findings based on focus group discussion were summarised as follows;

Table 2. SWOT analysis based on FGD comments.

| Themes                  | Data extract                                                                 | Participants | S, W, O, T |
|-------------------------|------------------------------------------------------------------------------|--------------|------------|
| Policies & guidelines   | "No available alternative in green practices."                             | P1           | T          |
|                         | "Existing policies not enough yet to drive green procurement."              | P6           | W          |
| Green Specification     | "Must be integrated into tendering and contract."                           | P4           | W          |
| Sponsorship             | "Lack of sponsorship and stakeholder not ready to change."                 | P4           | T          |
| Knowledge/Awareness     | "Local construction industry still not mature in term of green procurement."| P5           | W          |
|                         | "Everybody wants to go green, but not many understand what the going green means is" | P7           | W          |
|                         | "Not serious and not clear in                                             |              | W          |

implementing green procurement."

The government need to create awareness, info, input or training that provide knowledge to industry practitioners

“people did not see the impacts of using certain materials and relate it with environmental aspect rather than giving them profit”

P8 W

Training

"Providing training to construction stakeholders." P1 O

Government support

"Government play important roles, in policy enforcement such as green certification."

"Impose the use of green procurement as mandatory, if government say do it, everyone will follow."

P8 O

P9 O

Cost

“we concern about the budget. when we talk about green procurement, we will think about the higher cost.”

P10 W

Local supply

"Main concern, supplier for green material and products, are still lacking, mostly we need to resource from Semenanjung most of the time we have a problem such as transport and local supply." P8 W

Expertise

“In term of resources, yes, we have it but in term of human resources and expertise is still lacking.” P11 T

Incentives

“Incentives from the Government as initiatives for the next step so that the stakeholders make use and take advantage from it.” P12 O

4.2 Summary way forward/improvement

From the analysis, it can be concluded that from the perspective of local contexts, there is no strength of green procurement been highlighted by the participants and this shows minimal knowledge and awareness of green procurement strengths and benefits. Different authors highlighted that based on countries that implement green procurement, green procurement could minimise environmental damages, less waste, less energy consumption, financial and environmental of construction can be
improved, reduce pollution, raised awareness among staff on green practices and policies as well as improve company's positive image. Supply chain networks also can be enhanced.

From a focal point of local contexts, the weaknesses of green procurement are the policies and guidelines not enough yet to drive local construction players to implement green procurement. Previous researchers also mentioned that there are insufficient policies available. Moreover, green specification not integrated into tendering and contract. It is crucial for the government to enforce the policy and make it as mandatory as a driver towards implementation of green procurement in construction projects. [16] also highlighted that policy pressure such as changes in building codes will make the developers refused to implement green procurement practice.

Moreover, this incurred a higher cost and lack of resources and supply of green products. According to [11], [12]; [13]; [4], lack of awareness, lack of knowledge, lack of funding are the weaknesses of green procurement implementation. Without awareness and knowledge, the construction players will not implement this in construction projects because giving knowledge regarding future benefits of environmental, economic and social benefits are essential to ensure that they aware of the benefits of using the green procurement. Lacking human resources and expertise will create problems in the implementation of green procurement. According to [15], it is important to provide technological basis such as green techniques to ensure the implementation of green procurement. Moreover, support and collaboration from both government and industry is important to increase the awareness in construction. It is also highlighted by the participants on the lack of awareness and knowledge of green procurement among local construction player. Giving training will provide opportunities regarding building green procurement expertise, expands its tools and set requirements. Implementation of green procurement will increase and creates business opportunities with international investors. From the group discussion, one of the participants highlighted that there are a lot of activities were introduced to educate contractor and stakeholder on the importance of taking care of the environment such as seminar to expose them on the environmental aspect and safety at the construction site. The green campus has also been introduced as an early exposure to students and staff to raise awareness of the green element in construction.

From the participant's perspectives, green procurement incurred a higher cost to implement in the construction project. They need government support regarding giving incentives, sponsorship or funding as a driver to perform green procurement in the construction project. Lacking regarding funding will make contractors reluctant and not ready to change. Top management supports are also essential to ensure green procurement can be implemented.

5. Conclusion

As a conclusion, the awareness and knowledge of green procurement need to be exposed towards construction players to ensure that they know about the benefits and function of green procurement in construction. The participants have not highlighted the strengths of green procurement because of minimal awareness and knowledge about it. The drivers to implement green procurement in construction are essential to ensure that it can be slowly being implemented in the construction projects. Policies and guidelines need to be clear, specifics and enforced by the government as mandatory to ensure that construction players implement it in the projects. More training required to form more expertise and give them knowledge on green-related practices and procurement. Furthermore, the need for financial support from the government is essential to show they support green procurement implementation in construction projects. These are the important factors in ensuring the implementation of green procurement in construction projects among Malaysian.

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