Green Material Procurement Implementation Towards Green Buildings

Shahela Mamter[1], Siti Rohayu Jusoh[2], Mohd Esham Mamat[3], Norazlin Mat Salleh[4]
[1234]Department of Quantity Surveying, Faculty of Architecture, Planning and Surveying, Universiti Teknologi MARA Cawangan Perak, Malaysia,
Email: shahe789@ uitm.edu.my perak

Abstract

Nowadays, construction industry has increasingly demanding and important in Malaysia. However, the current practices of the construction industry have significant impacts on environment. In order to minimize the issues on the environment, green buildings have been implemented in Malaysia. On the other hand, to ensure that the buildings are certified as green building, green materials must be used to environmental friendly.. Hence, the aim of this research is to investigate the green material procurement awareness among contractors towards the implementation of green building. These paper objectives are to identify the implementation of green material procurement in Malaysia and to examine the barriers and challenges for implementation of green material procurement faced by contractors. A total numbers of 95 questionnaires were distributed to G7 and G6 contractors in Selangor. Only 57 questionnaires were returned and were analyzed using Statistical Package for Social Science (SPSS) version 21.0 software. The researcher revealed that the most of the contractors are aware and getting serious attention but still in infancy stage to use green material procurement towards the implementation of green building. Many recommendations were analyzed by researcher in order to sustain the implementation of green material procurement in Malaysia.

Keywords: Green material procurement, awareness, green building, G7 and G8 contractors

1.0 Introduction

In Malaysia, the green construction is still at early stage and faces great challenges to penetrate market widely (Zainul Abidin, 2010). Abidin et al. (2013) noted that there are some buildings which claimed to be green but were not classified as green building because they do not meet certain requirements because of the design, orientation of the houses and the materials used do not help in terms of cooling the indoor environment which necessitated the occupier to use air-conditioners, hence contributing to more emission of greenhouse gases. According to Elforgani and Rahmat (2010) stated the explosion of construction activities led to gab between effective policies and environmental problems. The lack of directives from high-level leadership such as Governor, Executive Directors, General Manager and Policy Makers is considered as one of the most critical barriers to implement green design and this leads to a lack of mandatory green design standards and control mechanisms. In addition, Shafii (2005) point out that there are many impediments to developing sustainable development in Asia such as lack of awareness, lack of training and education about sustainable design, higher cost, special materials, rules and regulation, lack of demonstration, lack of technology and lack of demand. The willingness towards adoption of sustainable materials from construction practitioners like developers and contractors are still low (Tey et al., 2013). In addition, based on Durmus-Pedini and Ashuri (2010) it might result in issues about new green material because it was not faced before and become sources of litigation. Other than that, refer to NAO (2005), which described the top challenges to achieve sustainable procurement in central government are cause by lack of knowledge about what sustainable procurement is and how to achieve the sustainability itself.

2.0 Green Material Procurement

The global economy grow rapidly if the construction development worldwide changed drastically. Thus, the green materials chosen are important in order to meet the friendly environmental. Milani (2001) noted that, " a green material is one that simultaneously does the most with the least, fits most harmoniously within ecosystem processes, helps eliminate the use of other materials and energy, and contributes to the attainment of a service-based economy". Similarly, "green" material might be deployed or installed in destructive ways that completely negate their positive characteristics. By being salvaged and reused, a the conventional material might become a green material. Although Howe (2010) define that renewable resource are mainly contain in green building material to minimize maintenance and improve health and productivity. The characteristic like reuse and recycled content, zero or low of toxicity, sustainably and rapidly renewable harvested materials, high recyclability, durability, longevity and local production must be evaluated first before it can be choose by user. In agreeing with

Howe, Pavan (2010) adds that it must not pollute the environment, approving chemical and not tested on animals. According to Martins 2009; Clough et al. as cited by Ruparathna and Hewage (2013) highlight the element that include in procurement such as sourcing, purchasing, and all activities related to providing knowledge, manpower, equipment, materials, supplies, supervision, and management services necessary to accomplish the project objectives. It means that the procurement has become an important part in project of construction. Whereas, according to Waltonetal as cited by Igarashi, De Boer and Fet (2013) stated that the proper selection of suppliers has become an important decision because not only provide the right materials, products or solution at a competitive cost level, but it also must pay attention to environmental problems. So, as an example the material used must be free from hazardous materials or find other solutions that use the less material sand or energy. An environmental effort that has done by the firms wills not successes unless they combine the company's environmental objectives with the activities of purchasing product. According to Parikka-Alhola as cited by Zhu, Geng and Sarkis (2013) Government Public Procurement (GPP) is a method used to decrease the impacts of environment from purchased product for their whole life cycle by designing friendly product and production by manufacturer through public purchasing effort. Zhu, Geng and Sarkis (2013) added that GPP must be practices wisely by considering environmental problems related to good production, uses as well as treatment or disposal of used products. It not easy to identify the correctly procurement situation, unless provide some auditing form or eco-labeling may be appropriate. It is necessary to make use of various indicator and labels for public and government procurement staff especially for developing countries and municipal governmental level because they does not have expertise to making judgment for the greenness of the product itself.

3.0 The implementation of Green Material Procurement in Malaysia

The implementation of Government Green Procurement (GGP) has been accepted and recognize worldwide for the purpose of minimizing the environmental problems. Thus, the GGP policies were introduced to ensure government take attention on environmental consideration when make their government procurement decision. In Malaysia, (GGP) are exclusively specific to the supplies procurement, services and works by the Government that focus on environment which is to conserve and reduce the effect of environmental problems, to speed the national economy and sustainable development promotion. However, the concept of GGP is still fresh in Malaysia. So, many problems are occurring at this time such as there is no such policy, regulation and legal framework toward the GGP concept (Adham and Siwar, 2012). Besides, for those individual either company or corporate body that are interested to take part in the government procurement of supplies and services need to register with Ministry of Finance (MOF) while, they need to register with the Contractors Service Centre (Pusat Khidmat Kontraktor; PKK) and the Construction Industry Development Board Malaysia (CIDB), which are agencies under Ministry of Works (Ministry of Finance Malaysia, 2010). Based on Table 1, CIDB was published the project cycle and practices for those are implemented green building construction.

Malaysia government played a vital role for several institutions which include KeTTHA, CIDB, GBI organization and Green Tech Malaysia regarding to promotion of green construction awareness. Thus, GreenTech Malaysia cooperates with the federation of Malaysia manufacturers (FMM) to continue their plan to organize the Green Technology Road Show 2010 to guide the public in construction sector (KeTTHA, 2010).

Other than that, the government has taken an initiative to implement GGP practices in Malaysia. It has been outlined in 10th Malaysian Plan under valuing the nation’s environment endowment. The main objectives GGP are to support Government programs by obtaining value for money through the acquisition of works, supplies and services (Musa et al., 2013).

Recognizing the importance of Government Green Procurement (GGP), the Malaysian government has engaged in various initiatives to boost demand for green products and services with the target set at 50% of the selected products and services purchased by the government sector are eco-labelled by the year 2020. The Malaysian government has acknowledged the importance of GGP and initial steps have been carried out towards its implementation. Figure 1 shows the GGP process flow, based on GreenTech Malaysia’s sustainable procurement initiatives:

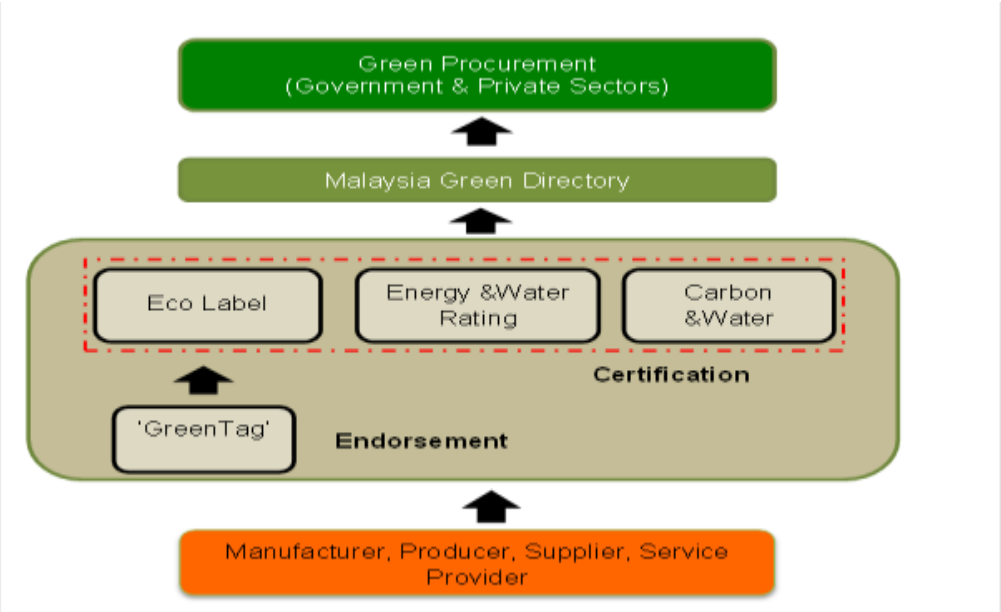

Figure 1: Green Government Procurement (GGP) process flow. (Sources in GreenTech Malaysia's 2015)

In the context of guidebook prepared by CIDB, the project cycle is simplified into four (4) stages which are:

- Planning
- Pre construction
- Construction
- Completion/ handover

Table 1: The project cycle in CIDB. (Sources: Guidebook on Planning and implementing Green Practices CIDB)

Planning and Design Stage	Green consideration
• Owners' needs • Legal requirement • Economic / technological feasibility • Project scope defined • Project design • Budget allocation / cost estimation	• Environmental Feasibility study (EIA) • EMP • Sustainable concept and strata
Pre-construction Stage	**Green Consideration**
• Procurement – appointment of contractors and consultants	• Environmental Bill of Quantities for bidding contractors
Construction Stage	**Green Consideration**
• Building erection • Delivery of material	• Best environmental practices – erosion and siltation control, waste management, housekeeping, etc
Completion and Handover	**Green Consideration**
• Site demobilization • Testing and commissioning • Application for fitness certificate • Handing over to owner with as-built drawings	• Close out plan – waste disposal, site remediation including options of decontamination and re- vegetation, recycling potential of salvaged items from demolished temporary facilities two years to both.

4.0 Methodology

In order to get the result of research, two methods were used: quantitative and qualitative method. However, this research only used quantitative method. Thus, a set questionnaire was developed and distributed to contractors

registered in CIDB. So, the result for this method will be present in some visuals such as tables, bar charts, pie chart etc. The table 2 below shows the total of the distribution and rate of return of questionnaire.

Table 2: Population and Sample

Population	Distribution	Rate of Return (60%)
1694	**95**	**57**

According to Table 2 above, the questionnaires were distributed to 95 persons from the total numbers of population which focuses on the G7 and G6 contractors registered in CIDB. However, at least 60% from the total distributed questionnaire should be collected due to the several contingencies.

5.0 Findings

The literature review and questionnaire has been prepared in order to achieve these objectives. The study reveals the following findings as listed below:

5.1 Implementation of Green Material Procurement in Malaysia.

Based on Table 3 the analysis carried out, most of the respondents are agreed to achieve the implementation of the green material procurement, these responsibilities are taken by the government of Malaysia to ensure that construction players are aware about new technology for green product. This is because, by using the sustainable building material, it will preserve the environmental conditions.

Table 3: Green Material Procurement Implementation in Malaysia

ITEM NO.	DESCRIPTION	MEAN	RANKING
1.	In Malaysia, the government takes responsibilities to ensure the construction players aware about new technology for green product.	4.09	1
2.	Construction players have emphasized the uses of green materials in the construction industry.	3.88	4
3.	Many constructions have implemented the green product toward making the building can classified as green building.	3.79	5
4.	The Green Government Procurement (GGP) was introduced to focus on supplies procurement, services and works by the Government which give focus on environment.	3.91	3
5.	The consideration of environmental aspects is known as green purchasing or green procurement.	4.02	2

5.2 Green Material Procurement Challenges and or Barriers

Based on Table 4, lack of awareness and understanding is a big issue that contributes the highest rank. The second highest is agreed that it needs a special material to be used in order to make the building is sustainable building. Besides, the third rank for this question is share for two statement which include lack of information towards environmental impact on the product and higher cost needed to use green material in construction make the construction players do not implement the green material procurement during purchasing the materials.

Table 4: Challenges for implementing of green material procurement

ITEM NO.	DESCRIPTION	MEAN	RANKING
1.	Higher cost needed for use green material in construction.	4.56	3
2.	Difficulties in finding suppliers for green materials.	4.35	6
3.	It needs special materials.	4.63	2

4.	Lack of information towards environmental impact on the product.	4.56	3
5.	Lack of awareness and understanding.	4.77	1
6.	Lack of competent people in the government agencies.	4.54	5
7.	Lack of incentive for companies to implement green procurement.	4.32	7
8.	The demand for the environmental sustainability still low.	4.02	8

6.0 Recommendation

There are a few recommendations for future research on green material procurement towards the implementation of green building as following:

a) This scope of research in Selangor, it is recommended to carry out in different states in Malaysia to determine whether the findings result different or not.
b) It is recommended to take other construction stakeholders as a respondent such as customer in order to know their perception towards the green material procurement.
c) This research only used a questionnaire method. For the further study would be carried out in different ways, such as interview in order to collect the data.

7.0 References

Adham, K.N. and Siwar, C.(2012), 'Empirical Investigation of Government Green Procurement (GGP) Practices in Malaysia', *OIDA International Journal of Sustainable Development 4(4), pp 77-87*

Durmus-Pedini, A. and Ashuri, B. (2010),'An Overview of the Benefits and Risk Factors of Going Green in Existing Buildings',*International Journal of Facility Management*, Vol.1(No.1), pp 1-15.

Elforgani, M. and Rahmat, I. (2010), 'An Investigation of Factors Influencing Design Team Attributes in Green Buildings',*American Journal of Applied Sciences*, 7(7), pp 345 – 350.

GreenTech Malaysia (2015), 'Government Green Procurement in Malaysia'. Available at: www.greentechmalaysia.my [Accessed 20 February 2015]

Howe, J.C. (2010), 'Overview of green buildings', National Wetlands Newsletter, 33(1), Available at: http://web.ebscohost.com.libdb.njit.edu [Accessed 15 July 2014]

Igarashi, M., De Boer, L. and Fet, A. (2013),'What is Required for Greener Supplier Selection? A Literature Review and Conceptual Model Development', *Journal of Purchasing and Supply Management*, 19(4), pp 247-263.

Milani. B. (2001), 'Building material in a green economy-community based strategies for dematerialization', Conference of the Canadian Society for Ecological Economics (CANSEE), McGill University, Montreal. Available at: greenn/Green%20Building%20Materials.htm [Accessed 11 August 2014]

Ministry of Finance Malaysia (MOF) (2010), 'Malaysia Procurement Regime. Government Procurement Division, Ministry of Finance Malaysia'. Available at: http://www.treasury.gov.my/pdf/lainlain/ msia_regime.pdf [Accessed 2 April 2011]

Musa, N of G., Buniamin, S., Johari, N., Ahmad, N., Rauf, F. and Rashid, A. (2013),'Key Indicators towards the Implementation Green Government Procurement in Malaysia'.

NAO (2005), 'Sustainable Procurement in Central Government,NAO, London'. Available at: www.nao.org.uk/nao/psd_toolkit/downloads.asp [Accessed 15 May 2014]

Pavan Mishra, P. S. (2010),'Golden Rule of Green Marketing- Green Marketing In India: Emerging Opportunities and Challenges, 3, 6. *Journal of Engineering, Science and Management Education,* pp 9 – 14.

Ruparathna, R. and Hewage, K. (2013), 'Review of Contemporary Construction Procurement Practices', *Journal of Management in Engineering.*

Shafii, F. (2005), 'Sustainable Building in the Malaysia Context'.Available at: http://web.utm.my/skpost [Accessed 11 May 2014].

Tey, J. S., Goh, K. C., Seow, T. W., & Goh, H. H. (2013), 'Challenges in Adopting Sustainable Materials in Malaysian Construction Industry", July 2013, International Conference on Sustainable Building Asia (SB13 SEOUL), Seoul, Korea.

ZainulAbidin, N. (2010)'Investigating the Awareness and Application of Sustainable Construction Concept by Malaysian Developers', Habitat International, 34(4), pp 421- 426.

Zhu, Q., Geng, Y. and Sarkis, J. (2013),'Motivating Green Public Procurement in China: An Individual Level Perspective. *Journal of environmental management,* 126, pp 85-95.