

# Green Procurement Practices and Barriers in Furniture Manufacturing Companies

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**Abstract**— Lack of awareness is the most significant barrier to implementing green procurement practices among procurement managers. Procurement managers seldom consider the effects of procurement on the environment. This situation will cause many environmental problems such as carbon dioxide emissions, climate change, greenhouse effects, pollution, and deforestation. Hence, the purpose of this study is to identify the current practices of green procurement in furniture manufacturing companies. Additionally, this study intends to determine barriers to green procurement practices in furniture manufacturing companies. In this study, 118 procurement officers and managers were chosen randomly from furniture manufacturing companies in Batu Pahat, Johor. This study applied a quantitative method and utilized the Statistical Package Social Science (SPSS) version 20.0 to analyse the data from the responses of questionnaires. Descriptive analysis was employed to achieve the research objectives. The findings of this study have revealed that current practices of green procurement in furniture manufacturing companies include ensuring the safe, incoming movement of product to facilities, followed by ensuring that suppliers' locations are operated in a safe manner. Meanwhile, the main barrier to green procurement practices is that procedures for the implementation of green procurement are time-consuming. This study is important for furniture manufacturing companies to use green procurement practices in their operation and production processes.

**Keywords**—Green Procurement Practices; Barriers; Furniture Manufacturing Companies; Procurement Officers and Managers; Sustainable procurement

## 1. Introduction

The most significant barrier to green procurement practices is a lack of awareness among purchasing managers in Malaysia as stated by McMurray,

Islam, Siwar, and Fien [1]. They seldom take the effects of procurement on the environment into consideration. Such a situation causes them to purchase environmentally unfriendly products and services. This type of procurement products and services will actually result in the environmental deterioration problems in Malaysia, including climate change, greenhouse effect, pollution and deforestation. Environmental problems are a challenging issue in Malaysia [2]. For instance, emissions of carbon dioxide in Malaysia were higher than the global average in the energy sector in Malaysia. The emission of carbon dioxide in Malaysia was 0.7 percent of total carbon dioxide emissions and this is considered higher than other countries. In terms of metric tonnes per capita, carbon dioxide emissions in Malaysia were reported at 6.57 in 2004, increasing to 7.57 in 2008. Total carbon dioxide emissions from manufacturing companies reached 53 million metric tons in 2013. The emission of greenhouse gases in term of carbon dioxide from machining dust in furniture manufacturing companies is 112000 kg/TJ [3]. Thus, green procurement practices ought to be performed in order to minimize environmental problems. Green Procurement is defined as 'procurement that is consistent with the principles of sustainable development, such as ensuring a strong, healthy and just society, living within environmental limits and promoting good governance [4].

Malaysia government had developed some policies in order to promote green procurement practices [5]. Ministry of Energy, Green Technology and Water (MEGTW) and Ministry of Finance of Malaysia are responsible for planning the mechanism of green procurement adoption in Malaysia. Green procurement was included in the Tenth Malaysian Plan [6] and it is a part of the blueprint for the upcoming Eleventh Malaysian Plan [7]. The government is a decision maker with the rights to decide to procure greener products and service and also encourage businesses involved in

environmentally friendly activities. There are some environmental programs such as cleaner technology and production, prevention pollution and adoption of the Environmental Management System (EMS) and ISO 140001 certification in Malaysia. Malaysia had experienced growth of this standard with an increase from 241 in December 2000 to 367 at the end of 2002. This is an advantage in that Environmental Management System (EMS) represents an overall commitment by merchants to environmental performance instead of a product-centered approach [8].

Many previous studies on green procurement practices were carried out in countries such as Kenya, China, the UK and the USA [1]. Literature studies have been conducted in the areas of hospital, construction, food and Information Technology (IT). The study of green procurement practices is still lacking in Malaysia. In order to address this gap, a study of green procurement practices should be conducted for Malaysian furniture manufacturing companies. Green procurement practices are still considered as new insights for Malaysia although it has actually emerged from previous literature. Therefore, studies on green procurement practices are important and encouraging in Malaysia. Green procurement practices will lead to a more greenish environment in future years. The objectives of this study are: (a) to identify the current practices of green procurement in furniture manufacturing companies; and (b) determine barriers to green procurement practices in furniture manufacturing companies.

## 2. Literature Review

Green Procurement or sustainable procurement first emerged in 1992 [9]. Now, green procurement is fast growing at current trend and is a key component of companies' corporate responsibility and green strategy [10]. The policy and strategies of green procurement in both private and government companies are important for maintaining social, economic and environmental benefits. Such policies and strategies may promote green development more widely in the future [11]. Green procurement decisions take into consideration the environmental and social impacts of product and services along with cost. The key areas of green procurement are related to waste, stationery, building maintenance, Information Technology (IT) equipment, food and transportation methods such as air travel and bicycles [10]. Additionally, green procurement helps companies influence the supply chain by asking suppliers to follow certain environmental criteria before a purchase is made or a contract is signed [12]. It prioritizes the purchase of

environmentally-friendly products, components, and raw materials from suppliers and also addresses areas such as transport for business, utilities and equipment [12].

There is fast growth in the field of green procurement in government organizations and sectors across the world. Green procurement is a new concept and initiatives have been taken in Malaysia for improving sustainability [13]. Green procurement is effective for minimizing environmental impacts. Based on the Green Purchasing Network Malaysia [13], there are some of the essential principles of the green procurement include that consideration of necessity before purchasing, taken concern about environmental impact due to entire product life cycle and consideration of company and distributor environmental performance. Besides, green procurement also promotes the growth of local companies by maximum use of local materials and resources [5]. Therefore, this will enhance companies through technology and expertise transfer and encourage local companies to accelerate Malaysia's economic growth [14]. Thus, green procurement will definitely support the development of a green economy [5].

Based on previous studies, there are significant barriers to the development, adoption and implementation of green procurement practices across country and companies [15]. According to Preuss [16], the financial barriers in the form of cost or price, lack of budget, lack of resources were the largest barrier of the green procurement practices. The other barriers stated in existing literature are the lack of awareness, time pressure [17], lack of top management commitment [18, 19], and lack of guidance [19]. Based on previous studies, cost concerns showed a significantly higher rate in public companies [20]. Besides, barrier such as no enforcement code to implement the green procurement were identified by previous researchers [20].

## 3. Methodology

Quantitative research is a method that explains phenomena by collecting numerical data and analysing it using mathematically based method [21]. All the data that was collected quantitatively was analysed using SPSS. A random sampling technique was implemented in this research. The target population of this research was all furniture manufacturing companies around Batu Pahat, Johor. The estimated population size in furniture manufacturing companies is 170. Based on the Krejcie and Morgan [22] table, the sample size is 118 respondents. The respondents for this research are those involved in the purchasing department,

including purchasing officers and managers, in furniture manufacturing companies in Batu Pahat, Johor.

In this research, pre-testing of the questionnaire was done with 30 procurement officers and managers from furniture manufacturing companies. The Cronbach Alpha for the questionnaire that obtained in the pre-test was 0.890 which was considered as acceptable [23]. The questionnaires were distributed to the targeted respondents. The researcher distributed 118 sets of questionnaires to furniture manufacturing companies that are located at Batu Pahat, Johor according to the sample size that has been determined. However, only 87 responses were received back, which presents a response rate about 73.7%. The research questionnaires were divided into three sections: general background of the respondent, current practices of green procurement, and barriers to green procurement practices in furniture manufacturing companies. Section 1 uses the demographic profile methods to collect demographic data, whereas section 2 and 3 questions in the questionnaire are based on Likert 5-point Scale which modified from the study of Buniamin et al. [20]. The rankings range from 1=strongly disagree until 5=strongly agree.

The data collected were analysed by using the Statistical Package for Social Science (SPSS). SPSS is a type of software that help to manage and analyse large amounts of data collected by compiling accurate results in the form of tables and graphical charts. Descriptive analysis was used to describe the data and characteristics of the population being studied [24]. Not only that, descriptive analysis was employed to determine the average number, standard deviation, percentage and ranking. This includes graphical reports in the form of charts, graphs and tables. According to Neuman [24], tendency level is used to describe the mean range of each choice of the questions. The standard deviation was used to describe the dispersion of the data collected and examine the data with respect to the mean.

## 4. Results and Findings

### 4.1 Current Practices of Green Procurement

In the section 2 of the questionnaire, the targeted respondents rated the current practices of Green Procurement in furniture manufacturing companies along a 5 point Likert Scale ranging from 1=Strongly Disagree, 2= Disagree, 3= Neutral, 4= Agree, and 5=Strongly Agree. Descriptive analysis was used to analyze the mean and standard deviation of different measurement items. Table 1 demonstrates the descriptive analysis on the items

of current practices of Green Procurement in furniture manufacturing companies.

**Table 1.** Descriptive Analysis on the Current Practices of Green Procurement

No	Question	Mean	Std. Deviation	Interpretation
1	Ensures that suppliers' locations are operated in a safe manner	4.14	.765	High
2	Report the specific policy which requires implementation of green procurement practices	3.22	1.072	Moderate
3	Purchase from suppliers utilizing local material and resource	3.66	.887	Moderate
4	Ensure the safe, incoming movement of product to our facilities	4.29	.791	High
5	Conducts awareness training program on green procurement	2.94	.867	Moderate
6	Obtain supplier that comply with green policy	3.28	.885	Moderate
7	Obtain high-quality product or services from suppliers	3.40	.908	Moderate
8	Obtain product or services that meet the green requirement or policy	3.21	.865	Moderate
9	Obtain green products or services from suppliers are quite longer	3.45	.949	Moderate
10	Reports the procurement policy as relates to sustainable development	3.02	.889	Moderate
11	Look for suppliers that promote environmentally-friendly products	3.53	.913	Moderate
12	Reduces packaging material	3.46	.804	Moderate

13	Ask suppliers to commit to waste reduction goals	3.17	.781	Moderate
14	Visits suppliers' plants to ensure that they are not using sweatshop labor	2.75	.735	Moderate
15	Documented procedures in green procurement	3.03	.958	Moderate
16	Favor suppliers that rate highly on sustainability during tender process	3.03	.882	Moderate
17	Participants in the design of products for recycling or reuse	3.16	.963	Moderate
18	Look for suppliers who have been awarded suppliers' ISO 14000 certification	3.33	.787	Moderate
19	Established objectives for purchase of green products and services	3.20	.900	Moderate
20	Provides follow-up action of deficiencies in green procurement	3.33	.802	Moderate
21	Purchase from local and small suppliers	3.54	.846	Moderate

Table 1 reveals the mean and standard deviation of current practices of green procurement measurement items. All the items in the survey questionnaire have a moderate mean score according to the central tendency level. Based on the results, only two of the items have a high score mean, which means that many of the respondents agree with these items. The items are to ensure that suppliers' locations are operated in a safe manner and to ensure the safe, incoming movement of product to facilities with a mean value of 4.14 and 4.29 respectively. The highest mean is 4.29, which means that most of the respondents agree with the current practices to ensure the safe, incoming movement of product to our facilities. Fewer of the targeted respondents agreed to visit suppliers' plants to ensure that they are not using sweatshop labour with a mean of 2.75. That means that few of the respondents agree with the item among other moderate mean scores. Meanwhile, the standard

deviation is in the range of 0.735 to 1.072. The results show that the data points are not closely grouping around the mean. This is because the lower the value of standard deviation, the closer is the data to the average value.

## 4.2 Barriers of Green Procurement

In the section 3 of the questionnaire, the targeted respondents rated barriers to Green Procurement in furniture manufacturing companies with 5 points Likert Scale ranging from 1=Strongly Disagree, 2=Disagree, 3= Neutral, 4=Agree and 5=Strongly Agree. Descriptive analysis was used to analyze the mean and standard deviation of different measurement items. Table 2 displays the descriptive analysis on the items of barriers of Green Procurement in furniture manufacturing companies.

**Table 2.** Descriptive Analysis on the Barriers of Green Procurement

No	Question	Mean	Std. Deviation	Interpretation
1	Lack of proper guidance in implementing the green procurement	4.09	.772	High
2	There is no enforcement or specific code to implement the green procurement	3.56	1.053	Moderate
3	Purchasing green products are costly	4.40	.655	High
4	The cost of the procedure to implement green procurement is quite expensive.	4.51	.588	High
5	The procedures for implementation of green procurement are time-consuming	4.56	.604	High

6	There are lots of admin burden to implement green procurement	4.15	.870	High
7	Qualified staff is not sufficient to handle the green procurement	4.47	.587	High
8	Sufficient fund or allocated budget is not available for the implementation of green procurement	4.07	.818	High
9	Lack of commitment from top management in implementing the green procurement	4.22	.618	High
10	Lack of long-term observation	4.16	.697	High
	Average Mean Score	4.219		High

Table 2 shows the mean and standard deviation of barriers of green procurement items. Almost all of the items in the survey questionnaire have a high mean score according to the central tendency level. The highest mean is 4.56, which means that most of the respondents agree that the procedures for implementation of green procurement are time-consuming and fewer agree that there is no enforcement or specific code to implement green procurement, with a mean of 3.56. Meanwhile, the standard deviation is in the range of 0.587 to 1.053. The results show the data points are not closely grouping around the mean.

## 5. Discussions

Research question one is to identify what are the current practices of green procurement in the furniture manufacturing companies. From the results, most of the respondents implemented current practices by ensuring the safe incoming movement of product for facilities. Most of the respondents ensure that the entire process of materials and products moving into, though, and out of facilities are all in safe and controlled

conditions. For example, all the furniture such as desks, shelves, bins and other furniture should be unloaded prior to a move for ensuring safe in condition. Besides, furniture should be labelled a room number where it will be located and furniture that is not labelled will not be moved [25]. Most of the respondents will track their movement to and from the warehouse. Furthermore, they will ensure that the movements of materials are safe and health when handling or moving the material into facilities. The respondents understood that a change in the way of movements of products was being packaged and shipped as a way to be more environmentally and reduce the amount of material used [26]. Thus, implementation of green procurement practices may have an important effect on reducing the adverse environmental and social impact of business operations [27, 28].

The second highest mean is to ensure that the supplier's location is operated in a safe manner. Most of the respondents agreed that suppliers should provide and maintain a safe working environment as well as minimize hazards through safe work procedures ongoing safety training. For example, suppliers must provide a healthy and safe working environment for their workers. A safe working environment can improve the working condition and performance. Besides, a safe working environment also will gain a lot of trust from potential customers and improve a company's performance [29]. Most of the respondents agreed that purchase from suppliers utilizing local material and resource were also vital for making the furniture product. This was because a majority of them considered local suppliers to be the most commonly concerned about environmental issues [20]. Therefore, most of the respondents state that buying locally will definitely lower the greenhouse gas emissions and other resources associated with transportation of furniture. Some of the imported upholstered furnishing may contain toxic chemicals, such as fire retardants. The fire retardant will cause harm to life. It often has chronic harmful effects rather than immediate harmful effects [30]. Thus, most of the respondents buy local materials and resources. Some of the respondents also supported the development of green procurement practices and alternative materials to avoid the depletion of palm oil for making furniture. Most of them utilized the materials such as wood for furniture that has a strong environmentally friendly pedigree [31]. Meanwhile, the least implemented practice was to visit suppliers' plants to ensure that they were not using sweatshop labour. According to Fombrun [32], to protect human rights, socially responsible procuring requires ensuring suppliers do not use sweatshop labour. Thus, most of the suppliers comply with labour laws and do not use sweatshop labour which in turn improves companies' performance.

Research question two is to determine the barriers to the green procurement practices in furniture manufacturing companies. From the result, most of the respondents agree that the barrier of procedures for implementation of green procurement is time-consuming. This is because the preparatory stage for green procurement is crucial [33]. The United Nations Capital Development Fund stated that procurement is time-consuming and require complex procedures. Besides, implementing green procurement may require a review of existing procurement procedures [34]. Therefore, green procurement practices need time to implement in most companies. It is the most significant barrier that most of the respondents agree about in furniture manufacturing companies. The procedures of implementation of green procurement must be executed well in order to avoid problems such as delays, poor quality, and lack of value for companies.

The second highest barrier agreed upon by the respondents is that the cost of the procedure to implement green procurement is quite expensive. Most of the respondents have the perception that green procurement practices are expensive and will cost more [35]. This is because there are some procedures that need to be implemented well in companies. The green procurement practices are effective and cost saving for companies. Besides, green procurement is not a burden in cost, but a competitive advantage for companies [36]. Hence, the respondents should look at the benefits such as to reduce waste and improve resource efficiency, which result in saving costs of products and getting the best value for money. Most of the respondents agreed that qualified staff is not sufficient to handle the green procurement was the third highest barriers. This was because a number of procurement managers did not know what green procurement was, and only a small proportion of them had the view of green procurement as a standard procurement process which takes the environmental, social, and economics aspects into account [27]. Moreover, there is a lack of procurement expertise due to deficiency of training. This leads to fewer qualified staff to handle green procurement [4].

Meanwhile, the least barrier agreed upon by respondents was there was no enforcement or specific code to implement the green procurement. This was because there were some of the policies and regulations to implement green procurement. Besides, some of the number of suppliers are involved in testing the supplier code of conduct and providing feedback. The supplier code of conduct covers social, economic and environmental factors to develop a positive, long-lasting benefit for companies. This is one of the specific codes to implement green procurement for companies.

## 6. Conclusion

For current practices of green procurement, respondents focus more on the safe, incoming movement of product to facilities. Therefore, sustainable procurement practices had been determined in furniture manufacturing industry, Batu Pahat. They have also implemented green procurement practices in furniture manufacturing process such as to ensure that suppliers' locations are operated in a safe manner. With respect to barriers of green procurement, the main barrier is that procedures for implementation of green procurement are time-consuming. In general, the research has been successfully conducted and its objectives were achieved throughout the research process. The outcomes of this research are expected to provide a better understanding of the current practices of green procurement and barriers to furniture manufacturing companies. Green procurement practices are new but effective for minimizing environmental impacts. Moreover, green procurement practices provide some effects on economic, environmental, and social factors. Green procurement helps to reduce toxic and hazardous substances or waste and considers human health impacts.

There are some recommendations for future studies. Firstly, the recommendations are to consider improving and expanded this research by analysing a longer time period. A longer time period can provide more accurate results and contribute more to future research. Secondly, the researchers should consider a number of respondents from a different state of furniture manufacturing companies. This is because restraining the involvement of respondents from one state respondents could cause bias in the responses. This may cause the inaccuracy in the measurements and in getting accurate results. Besides, the researcher can also conduct the same study on food, textile, and others companies in order to get different results. Next, the questionnaire was used a five point Likert Scale method in which the respondents would not be able to provide their own answers. Therefore, future research can provide a qualitative method such as interview sessions for them to give more of their opinion.

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