

Identification of Sustainable Procurement in Manufacturing Industry

¹Shiau Wei Chan, ²Mohd Ezree Abdullah, ³Izzuddin Zaman and ¹Pei Pei Fong

¹Faculty of Technology Management and Business,

²Faculty of Civil and Environmental Engineering,

³Faculty of Mechanical and Manufacturing Engineering,

Universiti Tun Hussein Onn Malaysia, Batu Pahat, Johor, Malaysia

Abstract: Earlier studies had indicated that lack of awareness pose the most significant barrier to sustainable procurement implementation among procurement managers. This situation will cause many problems such as carbon emissions waste production and water consumption. The purpose of this study is to determine the extent of sustainable procurement practices amongst procurement managers in the furniture manufacturing industry located in Batu Pahat, Malaysia. The researcher conducted interviews with six managers. The audio-recordings of the interview protocols were transcribed and the data were analyzed using three methods which are data reduction, data displays and conclusion drawing. The findings of this study indicate that most of the companies purchase materials which are more environmental friendly and collect waste material for recycling purposes. This study is important for the manufacturing industry as a guideline to implement sustainable procurement practices in their operation and production processes.

Key words: Sustainable procurement, manufacturing industry waste production, drawing, operation, production processes

INTRODUCTION

Earlier studies had indicated that lack of awareness about sustainable procurement is becoming the most significant barrier to sustainable procurement implementation among procurement managers (McMurray *et al.*, 2014). The lack of awareness had caused low consideration among managers of the impacts that the procurement environment has on the community and social conditions of those delivering or receiving the products of the service (Mansi, 2015). Subsequently, many problems have occurred such as carbon emissions waste production and water consumption. Hence, sustainable procurement is very crucial while purchasing goods and services. In fact, there are numerous benefits of sustainable procurement that may result in considerable cost savings and more environmentally friendly solutions for instance reducing waste at the source, increasing beneficial uses and recycling (Walker and Brammer, 2009).

Sustainable procurement plays a vital role toward the environment. It takes social and environmental factors into consideration alongside with financial factors when making procurement decisions. It comprises of looking

beyond traditional economic parameters and making decisions based on associated risks, whole life costs, measures of success and implications for society and the environment. According to Walker and Brammer (2009), sustainable procurement is defined as “sustainable procurement is a 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” Components of sustainability in manufacturing companies are based on three common pillars or dimensions, i.e., economic, social and environmental sustainability.

Numerous studies on sustainable procurement had been conducted in foreign countries such as Europe (Large *et al.*, 2013) and India (Mansi, 2015). However, only a small amount of studies on this topic were conducted in Malaysia. In addition, a majority of these studies focused on procurement activities which do not harm our environment or cause many impacts on the society. Thus, in this study, the researcher had conducted a research to identify sustainable procurement amongst procurement managers in the furniture manufacturing industry.

Literature review: Sustainability is about searching a balance between economic, social and environmental needs. It includes taking accountability for the local, regional and global effects of our way of life. Meanwhile, procurement is about purchasing particular resources from external parties as required by internal operations. Sustainable Procurement (SP) is synonymous to Green Supply Chain Management (GSCM) (Srivastava, 2007) which is the coordination of the supply chain in a form that incorporates environmental concerns and considers inter-organizational activities (Green *et al.*, 2012). Walker and Brammer (2012) stated that sustainable procurement is a policy objective in public procurement and is the pursuit of sustainability objectives in the purchasing and supply process. The concept of sustainable procurement is extensive, comprehensive and multifaceted as it includes various interconnected features for instance supply process, buying and purchasing, value for money, society, environment, sustainable development, good governance and economy.

Sustainable procurement practices have been applied through numerous methods as a product lifecycle concept. The cycle begins at the designing of a product. Green design highlights on both environmental-conscious designs and life cycle analysis or assessment. When designing a product, the raw substances or materials used can be altered by the designing team during manufacturing in order to become less toxic and more environmental friendly (Srivastava, 2007). Additionally, manufacturing companies may apply green principles by using some approaches to diminish energy and resource consumption in the manufacturing process which is also referred to as recycling and reuse. Other green practices are minimizing detrimental emissions, using biodegradable and non-toxic materials and minimizing or eliminating waste.

There are six interdependent factors that affect the execution and success of sustainable procurement practices which are leadership, policy and programs organizational strategy organizational culture, capacity building, supply-side and finance (McMurray *et al.*, 2013). According to Ross, the government must lead by example and display through leadership which implements sustainable procurement. The implementation and execution of sustainable procurement policies by organizations in their cultures offer considerable chances to decrease adverse environmental and social influence of business operations (McMurray and Scott, 2003). Besides that sustainability ought to be incorporated into an organization's strategy in a way that matches the

organization's overall mission and goals (Lee *et al.*, 2010). In addition, sustainable procurement practices depend on the supply-side to provide sustainably produced goods and services as well. Furthermore, finance is the largest barrier in implementing sustainable procurement within organizations. Earlier studies demonstrated that financial restraints are in the form of costs, lack of funds and lack of resources (Preuss, 2001).

MATERIALS AND METHODS

Research design: This research used a qualitative method to achieve the research objective which is to determine sustainable procurement practices among procurement managers in furniture manufacturing companies. Qualitative data was collected through interviews. Through interviews, the researcher was able to generate rich data and meaningful insights about the implementation of sustainable procurement practices (Schultze and Avital, 2011). Before the interview sessions, the researcher obtained the permissions from the companies to participate in this study. After that, the researcher conducted interviews with six procurement managers. The interviews lasted for one hour each and were audio-recorded using a voice recorder. The interview data were then analyzed qualitatively. The analysis method used is the method of Miles and Huberman (1994) which include three components: data reduction, data displays and conclusion drawing.

Respondents: A total of six respondents were involved to help the researcher compile the required data. The respondents are procurement managers from different furniture manufacturing industries in Batu Pahat, Malaysia. The respondents were interviewed by the researcher based on questions that have been prepared. The respondents consist of 4 males and 2 females with ages ranging from 26-52 years old. Their service duration in their current company is from 3-20 year. To protect the respondents, their name and particulars are kept confidential and anonymous.

Instrumentation: In the present study, there are six questions used in the interview sessions with the procurement managers. The interview questions were validated by two experts, a crucial step which ensures that the questions can identify sustainable procurement practices among companies from the manufacturing industry. These two experts are lecturers from University

Table 1: Example of data reduction

Interview Questions	Company A (Respondent 1)	Company B (Respondent 2)	Company C (Respondent 3)	Company D (Respondent 4)	Company E (Respondent 5)	Company F (Respondent 6)
In your opinion, what do you understand sustainable procurement in manufacturing industry activities?	We purchased the materials which had bring environmental effect	We have implement green environmental concept when we design or produce a product in manufacturing industry	We act responsibly when we help protect our environment provide economic opportunity fairly and work safety in our business affairs	We integrate environmental and social considerations into the procurement process	Purchasing materials toward economic environment and social effect	Implementation of green environment practices in manufacturing process
Do you perform any practices in sustainable procurement activities? Can give me some examples?	Our company used materials which more environmental friendly such as chipboard and particle board We recycled extra and repeal of materials	Our company used materials such as chipboard and other real wood. We used recycle way to reduce waste	Our company used materials which is chipboard and medium-density fibreboard (MDF). We used all materials to produce so that reducing waste materials	Our company used chipboard, Medium Density Fibreboard (MDF) and plywood to produce furniture. We collected all the waste materials and pass to recycling	I used real wood which was discarded for producing furniture product	Our company used real wood and rubber wood as materials of product. We collected all the waste materials and pass to recycling

Tun Hussein Onn Malaysia (UTHM) in the field of manufacturing production and operation management. Expert A is a lecturer with extensive experience in the qualitative research field. She has taught university students for <5 years. While expert B is a lecturer who had ten years of teaching experience in industrial automation. He is actively involved in the development of automation manufacturing. All experts provided valuable opinions and recommendations on the interview questions. Then, appropriate amendments were made before executing the interviews.

RESULTS AND DISCUSSION

This study used qualitative methods of analysis which are data reduction, data displays and conclusion drawing (Miles and Huberman, 1994). Firstly, the researcher made use of data reduction, i.e., a process of selecting, focusing, simplifying, abstracting and transforming the data that appears in written-up field notes or transcriptions. Then, a data display which is an organized, compressed assembly of information that permits conclusion drawing and action was used. Lastly, the researcher utilized the conclusion drawing process to make conclusions from the collected data. The example of data reduction for this study is shown in Table 1.

Table 2 shows the data displays for sustainable procurement practices among manufacturing companies. According to the research results, different companies have different practices. Most companies use materials which are more environmental friendly and collect waste material for recycling. Only one company uses real wood which was discarded to produce new products.

Table 2: Data displays for sustainable procurement practices among manufacturing companies

Component	Sustainable procurement practices
Company A	Use materials which are more environmental friendly and collect waste materials for recycling
Company B	Use materials which are more environmental friendly and collect waste materials for recycling
Company C	Use materials which are more environmental friendly and collect waste materials for recycling
Company D	Use materials which are more environmental friendly and collect waste materials for recycling
Company E	Use real wood which was discarded to produce furniture
Company F	Use real wood and rubber wood as product materials and collect waste materials for recycling

For conclusion drawing, the researcher made a conclusion based on the interview data. It was found that most respondents understood the meaning of sustainable procurement in the manufacturing industry. Respondent 1 mentioned purchasing materials which have influences on the green environment because it is important for our health and safety. The rest of the respondents had similar answers to respondent 1. When sustainable procurement practices are implemented, all respondents were consistent with the principles of sustainable development such as ensuring a strong, healthy and just society, living within environmental limits and promoting good governance (Walker and Brammer, 2009).

Respondent 1 mentioned that their company uses materials which are more environmental friendly such as chipboards and particle boards. They recycled the extra and waste materials. That is one of the practices which implements sustainable procurement. The rest of the respondents also gave comparable responses as respondent 1 but respondent 5 used a different way to implement sustainable procurement practices. He used

real wood which was discarded to produce furniture such as coffee tables and bedsteads. He does not purchase any materials from supplier. Therefore, his practice was quite different with other respondents. This behavior showed reduction of energy and resource consumption in the manufacturing process (Zhu and Cote, 2004).

Next, the respondents were asked on factors which influenced sustainable procurement practices. The first factor is leadership. Most respondents led their employees to implement green practices while respondent 5 did not lead his employees as he handles the entire manufacturing process on his own and uses his ideas to create new furniture for his customers. The second factor is policies and programmes. Respondent 1, 3 and 4 had not set up any policies or programmes for sustainable procurement practices. All respondents used the green concept to implement sustainable procurement practices. The green concept is their organizational strategy which also acted as the third factor in influencing sustainable procurement practices. Respondent 3, 4 and 6 mentioned that their companies did not have an organizational culture which was the fourth factor that influences practices while another half of the respondents depended on less material waste to build up the culture in implementation practices. The fifth factor was the supply-side. Most respondents purchased green materials from their suppliers and reduce waste materials. Nowadays, most green materials are more expensive than other materials, so, all respondents agreed that financials is a factor that influences sustainable procurement practices.

The respondents were asked about the resulting implementation of sustainable procurement practices in the manufacturing industry. Based on the researcher's findings, most respondents implement the practices successfully. Sometimes, respondent 1 and 5 faced some problems in implementation practices. The example given by respondent 1 was material shortage because of insufficient wood resources from the supplier. Respondent 5's problem was not because he did not find suppliers to purchase materials but he instead chose to go directly to the forest to find real wood which were discarded.

According to the results from all respondents, sustainable procurement practices have some effects on the economic, environment and social factors. All respondents agreed that cost savings is the main effect due to procuring goods and services that are more efficient to operate and thereby, reducing operating costs. They used chipboards which were made by chippers and are more environmental friendly as material. Based on the

research, respondent 5 mentioned that he used 3R (reuse, reduce and recycle) to implement the practices. From the results, respondent 3 also considered his company's labour conditions to ensure that purchases are ethical and support fair trade and that supply chains are unharmed in terms of labor standards. Also, workforce welfare such as health and safety in the workplace was also promoted.

CONCLUSION

The objective of this research is to determine sustainable procurement practices among companies in the manufacturing industry. The methodology of the research is in accordance to the qualitative method which had been carried out via interviews. The respondents come from different positions but all jobs are focused on the purchase of materials in the furniture manufacturing industry located in Batu Pahat. To summarize, the objective of this research has been achieved successfully. Based on the objective of determining sustainable procurement practices among companies in the manufacturing industry, a summary can be derived from the discussions with the respondents. The companies which implement sustainable procurement use chipboard as material to produce furniture products. The result of the analysis proved that it was common to recycle to reduce waste materials. The materials used are chipboards which were made by chippers and are more environmental friendly. In this research, all respondents mentioned that green environment is important as it brings health and safety to humans.

In addition, there are some factors which influence sustainable procurement in the furniture manufacturing industry. Finance is the main factor that all respondents agreed with. Moreover, sustainable procurement practices brought out some effects to the companies' economy such as reducing the end-of-life disposal costs and impacts, lessening environment effects such as toxins, hazardous substances and waste and decreasing social impact such as dangers to the human health. Therefore, sustainable procurement practices are implemented successfully in furniture manufacturing industry.

Studies on sustainable procurement among companies in the manufacturing industry should continue to get better research results. The recommendations for future researchers include using quantitative research as it could possibly provide additional information. A combination of both qualitative and quantitative would give more weight to the themes established. In addition, future researchers can also use a variety of methods and approaches appropriate to obtain more detailed

information regarding this survey so that it can facilitate future researchers to observe, analyze and decide to adopt it as a perfect example. Furthermore, researchers can also conduct the same study on the food industry, corporations or organizations other than Small and Medium Enterprises (SMEs) to get different findings. This research provides a better understanding and gives further information about the importance of purchasing materials towards environment effect in the manufacturing industry, since there is a limited amount of studies focusing on sustainable procurement in the manufacturing industry. Therefore, this study provides significant contributions in relation to this field in Malaysia.

ACKNOWLEDGEMENT

This study was supported by Universiti Tun Hussein Onn Malaysia.

REFERENCES

- Green, K.W., P.J. Zelbst, J. Meacham and V.S. Bhadauria, 2012. Green supply chain management practices: impact on performance. *Supply Chain Manage. Int. J.*, 17: 290-305.
- Large, R.O., N. Kramer and R.K. Hartmann, 2013. Procurement of logistics services and sustainable development in Europe: Fields of activity and empirical results. *J. Purchasing Supply Manage.*, 19: 122-133.
- Lee, F.H., T.Z. Lee and W.Y. Wu, 2010. The relationship between human resource management practices, business strategy and firm performance: Evidence from steel industry in Taiwan. *Intl. J. Hum. Resour. Manage.*, 21: 1351-1372.
- Mansi, M., 2015. Sustainable procurement disclosure practices in central public sector enterprises: Evidence from India. *J. Purchasing Supply Manage.*, 21: 125-137.
- McMurray, A. and D. Scott, 2003. The relationship between organizational climate and organizational culture. *J. Am. Acad. Bus. Cambridge*, 3: 1-8.
- McMurray, A., M. Islam and J. Fien, 2013. Reframing sustainable procurement for the 21st Century: Proposing integrated theory. *AT. Bus. Manage. Rev.*, 9: 28-39.
- McMurray, A.J., M.M. Islam, C. Siwar and J. Fien, 2014. Sustainable procurement in Malaysian organizations: Practices, barriers and opportunities. *J. Purchasing Supply Manage.*, 20: 195-207.
- Miles, M.B. and A. Huberman, 1994. *Qualitative Data Analysis: An Expanded Sourcebook*. 2nd Edn., Sage, Thousand Oaks, California.
- Preuss, L., 2001. In dirty chains? Purchasing and greener manufacturing. *J. Bus. Ethics*, 34: 345-359.
- Schultze, U. and M. Avital, 2011. Designing interviews to generate rich data for information systems research. *Inf. Organiz.*, 21: 1-16.
- Srivastava, S.K., 2007. Green supply-chain management: A state-of-the-art literature review. *Int. J. Manage. Rev.*, 9: 53-80.
- Walker, H. and S. Brammer, 2009. Sustainable procurement in the United Kingdom public sector. *Supply Chain Manage. Intl. J.*, 14: 128-137.
- Walker, H. and S. Brammer, 2012. The relationship between sustainable procurement and e-procurement in the public sector. *Intl. J. Prod. Econ.*, 140: 256-268.
- Zhu, Q. and R.P. Cote, 2004. Integrating green supply chain management into an embryonic eco-industrial development: A case study of the Guitang Group. *J. Cleaner Prod.*, 12: 1025-1035.