

GREEN SUPPLY CHAIN MANAGEMENT PRACTICES IN MALAYSIA

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ABSTRACT

The purpose of the study is to determine the green practices that integrate environmental concerns into supply chain management among the industries in Malaysia. The review is focused on practices of green supply chain management (GSCM) implemented in Malaysian industries. Secondary data was used in this study, where a detailed review of previous researches in sorting out the literature and develop the research direction of the study. By comparing studies from past researches, it results that eco-design, green purchasing and reverse logistics are the most adopted green supply chain practices in Malaysia industries. These green practices may help in lowering the environmental impacts.

Keywords

Supply Chain Management, Green Supply Chain Management, Environmental Management, Green Practices.

1.0 INTRODUCTION

Environment has emerged as a hot issue for government and public. It is observed that business organizations activities are to be considered the source that brings most negative impact to the environment (Eltayeb, Zailani, and Jayaraman, 2010). Regarding to the environment pollution issue, GSCM emerges as a new systematic environmental approach and being practice in many organizations.

The main objective of this research is to investigate the practices of GSCM that has maintaining and achieving the effectiveness in lowering environmental impacts. According to Eltayeb & Zailani (2009), Malaysian rapid industrialization has caused negative impact on the environment due to increasing in pollution, waste, and rapid consumption of natural resources. Therefore, the problem statement of this study is what GSCM practices that implemented can

balance the economic and environmental sustainability of firms. However, different practices of GSCM show ability of firm in designing the strategy in increasing awareness on environmental sustainability issues. Thus, this study will investigate two research questions: (1) What are the GSCM practices apply in Malaysia industries? and (2) What is the extent of GSCM practices in industrial operation?

2.0 LITERATURE REVIEW

2.1 Green Supply Chain Management

There are various definition of GSCM exist in the literatures. According to Ninlawan, Seksan, Tossapol, and Pilada (2010), by adding the “green” component in the supply chain, it refers to GSCM which is defines as “green procurement+ green manufacturing+ green distribution+ reverse logistics”. Besides, GSCM also can be defined as “integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing process, delivery of the final product to the consumers as well as end-of-life management of the product after it useful life” (as cited by Seman, Zakuan, Jusoh, Shoki and Saman, 2012).

The concept of green supply chain management has become important agenda in business today (Rusli, Rahman and Ho, 2012). The green supply chain concept assumes full responsibility of a firm towards its products from the extraction or acquisition of raw materials up to final use and disposal of products (as cited by Eltayeb, Zailani and Ramayah, 2011). GSCM has proven to be an important strategy for successful companies as its practices have ranged from green purchasing to integrated supply chain flowing from the suppliers to customers which is ‘closing the loop’ (Rusli *et al.*, 2012).

2.2 Green Supply Chain Management in Malaysia

Malaysian government and the public have realized that the environmental issues are an important issue to be concerned. Malaysia's government has fully commitment in promoting low carbon technology in ensuring sustainable development while conserving natural environment and resources (Chua and Oh, 2011). Moreover, Environmental Quality Act has been amended several times since it was established in 1974 in order to encompass 18 sets of regulations to help implement projects relating to air, sewage and industrial effluent assessment (as cited by Eltayeb *et al.*, 2011). In addition, non-government organization (NGOs) such as Environmental Protection Society of Malaysia was formulated to monitor environmental issues.

In response to environmental issues at global and local levels, firms start to adopt green supply chain management initiatives. However, it is critical for developing countries like Malaysia to resolve pollution control problems by "going green" in order to move towards a sustainable environmental development and achieving the 'triple bottom line' of social, economic and environmental benefits (as cited by Savita, Dominic and Ramayah, 2012).

Table 1
GSCM in Malaysia based on literature

Title/Author/Year	Findings
Green manufacturing practices among wooden furniture manufacturers in Malaysia Ratnasingam and Wagner, 2009	<ul style="list-style-type: none"> The adoption of green manufacturing practices within the Malaysian wooden furniture industry is limited, as the lack of price premium for green furniture and the absence of stringent legislations do not induce the adoption of such practices among the Malaysian furniture industry, which is predominantly engaged in low-cost, high volume wooden furniture productions.
The influence of ISO 14000 on firm performance Joyce, 2009	<ul style="list-style-type: none"> ISO 14000 certification improves average return of equity but not necessarily in terms of sales and capitalization
Going green through green supply chain initiatives towards environmental sustainability Eltayeb et al., 2009	<ul style="list-style-type: none"> Eco-design is the most highly adopted green supply chain initiative among the certified manufacturing firms in Malaysia, followed by green purchasing and reverse logistics. Malaysian firms more focus in internal green supply chain initiatives (eco-design) compare with external relationships with suppliers

	and customers (green purchasing and reverse logistics).
The Examination on the drivers for green purchasing adoption among EMS 14001 certified companies in Malaysia ElTayeb <i>et al.</i> , 2010	<ul style="list-style-type: none"> Green purchasing is affected by the driver of regulations, customer pressures, expected business benefits and firm ownership. Although Malaysian firms show a high level of social responsibility, it does not constitute a genuine driver for firms to adopt.
Integrating Green Innovations in Logistics Services towards logistics services sustainability: A conceptual paper Jumadi and Zailani, 2010	<ul style="list-style-type: none"> Malaysia senior logistics executives perceive management knowledge and skills as their most important factor in managing logistics industry. There is a correlation between the degree of importance of green issues to companies' transportation and logistics strategy and that companies use of transportation/ logistics partner to help them green their supply chains.
Integrated Eco-design Tool for Malaysian Automobile Industry Gonzales et al., 2010	<ul style="list-style-type: none"> Examination on the different product eco-evaluation methods in terms of material recyclability, manufacturing process and disassemblability used for eco-design, especially in the automobile industry. Key area to support eco-design infrastructure in Malaysia are material, part process and assembly.
Green supply chain initiatives among certified companies in Malaysia and environmental sustainability: Investigating the outcomes Eltayeb et al., 2011	<ul style="list-style-type: none"> Eco-design has significant positive effect on four types of outcomes (environmental outcomes, economic outcomes, cost reductions, and intangible outcomes). Reverse logistics have significant positive effect on cost reduction only. Green purchasing don't have any significant positive effect on any of the four types of outcomes.
The relationship between Manufacturing System Performance and Green Practices in Supply Chain Management Mahmood, Rahman and Deros, 2011	<ul style="list-style-type: none"> Green supply chain practices that denominated as product recycling, environmental compliance and optimization have significant influence to some of the manufacturing performances.

Green progress and prospect in Malaysia Chua, and Oh, 2011	<ul style="list-style-type: none"> Pursuing green technology in economic and social developments not only helps sustain the non-renewable fuels, safeguards and minimizes the environmental degradation due to carbon emissions; it also creates a strong green economy and industry, inline with the country's vision as well as the rest of the world economies.
Greening of the supply chain through supply chain initiatives towards environmental sustainability Khidir & Zailani, 2011	<ul style="list-style-type: none"> Expected business benefits have the greatest influence on green supply chain initiatives followed by regulations and customer pressures, and finally social responsibility. Malaysian firms tend to respond regulations and customer pressures that require them to adopt green supply chain initiatives but the decision is based mainly on evaluating the benefits that return to the firms from adopting such initiatives.
Green Innovation Adoption among Logistics Services Providers in Malaysia: An Exploratory Study on the Managers' Perceptions Zailani, Amran, and Jumadi, 2011	<ul style="list-style-type: none"> Technology is an important tool in mitigating the environmental in logistics services.
Green Supply Chain Management in Developing Countries: A Study of Factors and Practices in Malaysia Rusli <i>et al.</i> , 2012	<ul style="list-style-type: none"> Customers, marketing, regulations, competitive and internal factors are among the factors that encouraged firms to adopt green practices. Manufacturers in Malaysia implement green purchasing, eco-design and internal green practices in their operations.
A Proposed of Green Practices and Green Innovation Model in Malaysian Automotive Industry Condong <i>et al.</i> , 2012	<ul style="list-style-type: none"> There is a positive and significant relationship between green practices (internal environmental management, technology integration, logistics management, customer focus, supplier focus) on green innovation (green product innovation and green process innovation).
Green Supply Chain Management: A Review and Research Direction Seman <i>et al.</i> , 2012	<ul style="list-style-type: none"> It is lack researches to examine the adoption and implementation of GSCM practices especially in developing countries such as Malaysia.
Eco-design strategy among ISO 14001 certified	<ul style="list-style-type: none"> Eco-green is a valuable approach that permits business to move beyond end-end-of-

manufacturing firms in Malaysia: Green drivers and its relationship to performance outcomes Savita, Dominic, Ramayah, 2012	<p>the-pipe solution towards sustainable development.</p> <ul style="list-style-type: none"> Technologies have infused in most business processes and supply chain, and Green IT/IS has therefore become one of the latest considerations to improve environmental problems.
The impact of external institutional drivers and internal strategy on environmental performance Zailani, Eltayeb, Hsu and Tan, 2012	<ul style="list-style-type: none"> Eco-design is a key factor to sustainable environmental performance. Regulation and incentives construct play a critical role in encouraging firms to implement effective eco-design

Table 1 show the findings studied by previous scholars related to GSCM in Malaysia. From the table, it shows clearly how researchers were attempt in promoting the green practices in Malaysia.

According to Seman *et al.* (2012), the studies of GSCM in Malaysia are still relatively new and the findings are also not conclusive. This is because a lot of companies in Malaysia are behind and yet not greening their business operation. According to Eltayeb *et al.* (2009), Malaysian fully owned companies have lower level of adoption and participants in green supply chain practices compare to foreign based companies and MNC (Multinational Company). The barriers in adopting GSCM in Malaysia depend on the companies' size and high cost of practicing green supply chain (as cited by Seman *et al.*, 2012).

As demonstrated in Table 2, the green practices implement in Malaysia is limited. Most of the scholars defined eco-design practice in their study.

Table 2
Green practices implement in Malaysia based on literature.

Source	Green practices
Eltayeb et al., 2009	Eco-design, green purchasing, reverse logistics
Eltayeb et al., 2009	Green purchasing
Gonzales et al., 2010	Eco-design
Eltayeb, Zailani and Ramayah, 2010	Eco-design, green Purchasing, supplier environmental collaboration, customer environmental collaboration, reverse logistics
Jumadi et al., 2010	Green logistics (green transportation, green storage, green packing, reverse logistics, green innovation)
Mahmood W. H. W., et al., 2011	Product recycling, environmental compliance, optimization of processes

Rusli et al., 2012	Green purchasing, internal green practices, reverse logistics, cooperation with suppliers/customers, eco-design
Condong, J., Zubir, A. F. M., Hashim, S. A. & Lanang, N. A. S., 2012.	Internal environmental management, technology integration, logistics management, customer focus, supplier management.
Savita <i>et al.</i> , 2012.	Eco-design
Zailani, Eltayeb, Hsu and Tan, 2012	Eco-design

3.0 METHODOLOGY

The methodology of this study consists of theoretical part where literature survey method being applied. Materials of this study were obtained from secondary data sources such as journals, internet (web-based) and books. Secondary data is useful in providing further information for this study besides supporting the reliability of this study. In order to provide the latest information or data, source of journals published since year 2008 were used. Based on the objective of the study, multiple journals related to GSCM were collected and analyze for the used to investigate the green practices in Malaysian industries.

4.0 FINDINGS

Comparisons between literatures were described pertaining to each research question (RQ) that mentioned earlier.

RQ 1: What are the most implemented GSCM practices in Malaysia?

By analyze the studies of previous scholars on GSCM practices in Malaysia (show in Table 2.). It can concluded that the eco-design, green purchasing and reverse logistics are the practices that commonly applied by Malaysian firms.

Eco-design refers to actions taken during product development aim at minimizing a product's environmental impact during its whole life-cycle without compromising other essential product criteria such as performance and cost (as cited by Eltayeb *et al.*, 2009). Accordingly, eco-design consider as a very important green practice because majority of environmental impacts arising from production, consumption and disposal of the product which direct consequences of decisions made at the design stage. However, according to Eltayeb *et al.* (2011) study, the basic eco-design activities include design for the reduction, design for reuse, design for recycling, design for manufacturing, and design for resource efficiency.

According to Lambert & Cooper (2000) study as cited by Eltayeb *et al.* (2011), green purchasing means that purchasing or supply chain managers consider the issue of sustainability in their purchasing of inputs in addition to the traditional purchasing criteria of cost, quality, and delivery. Green purchasing placed in an important and advantageous position to play a key role in the greening of products and activities as it located at the beginning of the forward flow of materials within an organization (Eltayeb *et al.*, 2010). Hamner (2006) as cited by Eltayeb *et al.* (2010) summarized the basic green purchasing activities in seven points: (1) product content requirements, (2) product content restrictions, (3) product content labeling or disclosure, (4) supplier questionnaires, (5) supplier environmental management systems, (6) supplier certification, and (7) supplier compliance auditing.

Reverse logistics focuses primarily on the return or take-back products and materials from the point of consumption to the forward supply chain for the purpose of recycling, reuse, manufacture, repair, refurbishing, or safe disposal of the products and materials (as cited by Eltayeb *et al.*, 2009). Reverse logistics is contrary to the traditional supply chain because its focus is to get product back from the customers rather than moving product to customers.

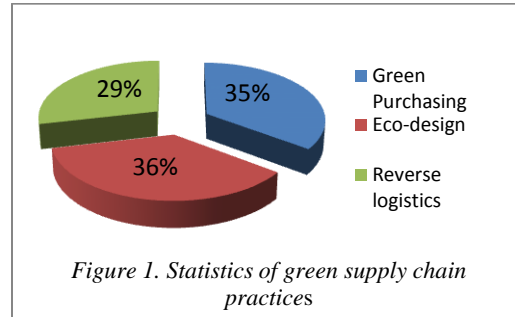


Figure 1. Statistics of green supply chain practices

Source: Eltayeb *et al.* (2009). Going green through green supply chain initiatives towards environmental sustainability.

According to Figure 1, the most implemented green practice in Malaysian industries is eco-design, then it followed by green purchasing and reverse logistics.

RQ 2: What is the extent of GSCM practices in industrial operation?

GSCM practices adoption differs between firms depending on their products and services. Basically, firm get involved with eco-design, green purchasing, and reverse logistics as their effort in support the greening in supply chain. Although GSCM approaches are still relatively new in Malaysia, it has

started to be implemented by manufacturing firms in Malaysia (Rusli *et al.*, 2012).

Eco-design encompasses green design items for products and packaging. In designing green in products, firms produce products that have reused or recycled materials in their contents such as recycled plastics and glass besides produce products that are free from hazardous substances such as lead, mercury, chromium, and cadmium. In addition, life cycle assessment is used to evaluate the environmental load of the products. While for the effort conducting eco-design in packaging, firms make sure that the products' packaging has recyclable contents, and minimize the use of materials in packaging (as cited by Eltayeb *et al.*, 2009).

Rusli *et al.* (2012) found that firms practice green purchasing in their operation by avoiding purchase substances that will give high impact to the environment. While for firms that must use chemical substances in their products, they will try to control or minimize the usage of hazardous chemical substances in their end products. Moreover, large firms tend to set strict green standards for their purchased inputs and mandate their suppliers to stick to these standards (Eltayeb *et al.*, 2010). Suppliers, in turn, set green specifications for their inputs purchased according to the standards set by customers.

In Rusli *et al.* (2012) study, interview through Malaysia's firms has been conducted and showed that firms try to reuse the production scrap rather than throw them away in managing the production scrap especially solid scraps. This is one of the reverse logistics dimensions in green operations as suggested by Rogers and Tibben-Lembke (2001) cited by Eltayeb *et al.* (2009).

4.1 Initial findings

GSCM continues to be an important research agenda among the researches. However, there is still limited of studies to investigate on GSCM practices adopted and implemented in Malaysia. Therefore, based on the previous scholars' studies, a theoretical framework has been proposed for my study (shown in Figure 2).

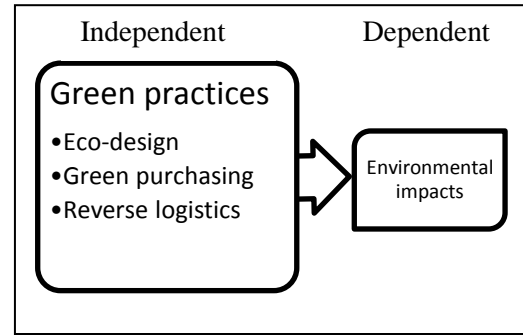


Figure 2: Theoretical framework

Figure 2 shows the relationship between independent variables (eco-design, green purchasing, and reverse logistics) and dependent variable (environmental impacts) in GSCM practices. Green practices that apply in supply chain management would bring impacts to environment. It may lower the environmental impacts such as reduction on consumption of natural resources.

5.0 DISCUSSION & CONCLUSION

As mentioned above, the researches on Malaysia is still lacking. Thus, investigating what Malaysian firms are doing currently in terms of GSCM practices are encouraged for the future researchers. In addition, future research should focus on the best practices to implement among Malaysian industrial and also increase the organization awareness level on environmental problems that caused by their firm's operation.

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