GREEN SUPPLY CHAIN MANAGEMENT: A RESEARCH AGENDA

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ABSTRACT

Green Supply Chain Management (GSCM) practices are gaining popularity among Malaysian Small and Medium Enterprises (SMEs), which is being increasingly implemented. Although previous research focused on GSCM practices and its outcomes extensively, most of the research based on developed countries. Limited research has been done about GSCM and its outcome in Malaysia. The purpose of this paper is to identify different types of GSCM practices and performance outcomes in Malaysian context. This paper will compare GSCM research at global level with the existing GSCM research in Malaysia to explore further directions of GSCM research in Malaysia.

Keywords: Green Supply Chain Management (GSCM), Small and Medium Enterprises (SMEs)

1. INTRODUCTION

Sustainability issues related to environment has gained much attention among stakeholders. As a result organizations choose the adoption of green supply chain management (GSCM) as an integrated approach to address the issues. Moreover, business organizations have been said as the source for the most of the environmental problems (El Tayeb et al, 2008). Sheu and Hu (2005) recognized that environmental issues have dramatically increased the awareness among organizations over the past ten years. (Sheu & Hu, 2005). GSCM practices has also extended to the entire value chain (from supplier to customer) when organizations inform buyers of ways to reduce their impact to the natural environment (Handfield, R & Nichols, 2002). The pressure and drive accompanying globalization has prompted enterprise to improve their environmental performance (Zhu & Sarkis, 2006). Sarkis and Tamarkin (2005) suggested that the

pressure on organizations to improve the environmental performance comes from globalization rather than localization. Increasing environmental concern has gradually become part of the overall corporation culture and, in turn, has helped to reengineer the strategies of organizations. This paper focusses on the potential of applying GSCM practices among Malaysian SMEs.

2. LITERATURE REVIEW

2.1 Green Supply Chain Management (GSCM)

According to Hervani, Helms, and Sarkis (2005), GSCM involves various activities such as reuse, remanufacturing and recycling, green design, green procurement practices, total quality environmental management, environmentally friendly packaging, transportation and managing end-life products practices GSCM is the phenomena of integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing process, delivery of the final product to consumers as well as end-of-life management of the product after its useful life (Srivastava, 2007). GSCM is also the practice of monitoring and improving environmental performance in the supply chain during a product's life cycle (H'Mida & Lakhal, 2007). Rettab and Brik (2008) stated GSCM is a managerial approach that seeks to minimize a product or service's environmental and social impacts or footprint. Consequently, GSCM is a proven way to reduce a company's impact on the environment while improving business performance (Torielli et al, 2011). A well-established GSCM focus upon sustainability on each stage ranges from product design, material selection, manufacturing, distribution of the product to user via forward logistic process, collecting back used product from the point of consumption either it is repair, recondition, remanufacture, recycle or dispose of by implementing reverse logistic practices (Larson, 2011).

In short, the pre requisite understanding of GSCM is to recognize the need and importance to preserve the environment whilst producing any products or services. The section elaborate further on how implementing GSCM impacts the environment.

2.2 Green Supply Chain Management in global context

Banerjee, S. (2001) stressed that environmental concerns have been spread local to regional and to global. Thus from the perspective of environmental concerns, integration of environmental concerns and SCM has been in focus for two decades (Rao & Holt, 2005). Jabbour, and Jabbour (2015a) indicated that the internal environmental management should be the first adopted GSCM practice to increase the organizational culture, green teams, and empowerment. Internal environmental management also provides the ground for the adoption of GSCM practices. For instance, green human resources encourage employees to consider waste management, pollution prevention, eco-efficiency and investment recovery. Jabbour, and Jabbour (2015b) examined the relationship between adoption of green operational practices and green performance in Brazilian ISO 9001 certified firms and found green operational practices do influence the green performance.

Huang, Tan, & Ding (2015) investigated the pressures and drivers that have been experienced by Chinese manufacturing SMEs. They concluded that Chinese manufacturing SMEs face pressures from different sources including regulations, customers, suppliers and public awareness to implement GSCM practices and being motivated by different drivers to implement GSCM practices. Another study in South Korea examined the effects of GSCM on supplier's environmental and operational performance with perspective of capital and relational social capital accumulation in supply chain. The study showed relational social capital is positively associated with operational performance and environmental performance affects operational performance significantly (Lee, Kim, & Choi, 2012).

In the study of Zhu et.al (2013) among Chinese owned SMEs, the implementation of GSCM practices were the result of institutional pressures for environmental protection. This was seconded by another study in China by Choi et al (2013) who suggested the internal green marketing to have a positive effect only on GSCM but it does not have significant impact on firm's market performance. There was one interesting finding which indicated the drivers of environmental processes and their impact on performance. In developing countries either law is written loosely for SMEs therefore it is ineffective for environment protection or written strongly knowing that it will not be enforced (Agan, Acar, & Borodin, 2013). In the developed nation, it was found that GSCM practices results improved environmental and economic performance that influence operational performance positively which enhances organizational performance explored (Green,et.al, 2012).

Based on the discussions, there are few essential highlights which are:

- Implementation of GSCM are mostly because of the pressure of regulators, customers and public awareness
- The main outcome expected from the implementation of GSCM is the protection of the environment
- GSCM may have impact of the economic performance in certain organizations

In the next section, an overview of the implementation of GSCM and the practices in Malaysia are elaborated.

2.3 Green Supply Chain Management in Malaysian context

The studies of GSCM in Malaysia are still limited and findings are not consistent. Despite the importance of GSCM in alleviating environmental issues and providing economic benefits to organizations, little is known about green supply chains, especially in the context of Malaysia (Zailani,. [32]. Common perception about GSCM practices is, it is environment friendly in the production of products, processes, systems and technologies and the way of conducting business (Vachon & Klassen, 2006). Environmental issues have become very important issue of concern for Malaysian government and the public (Eltayeb,et.al, 2011). The Environmental Quality Act was established in 1974 and has been amended a number of times to encompass 18 sets of regulations to help implement projects relating to clean air, sewage and industrial effluence assessment (Rao, 2004). According to a survey conducted by Tan (2005) in Malaysian manufacturing companies; it is found that they concern of environmental attributes in their production because of following three reasons, for the sake of competitive advantage, to gain government incentives, and because of influence of authorities.

Khor, & Udin (2013) investigated the effect of green product design and resource commitment in Malaysian ISO 14001 certified electrical and electronic manufacturing firms. From the research it was found that green product design has crucial product characteristics that elevate recoverability of electrical and electronic equipment's. It was also found using the substitution of heavy metals or hazardous substances with environmentally compliant raw materials facilitate reduction of toxic emission while design for environment minimizes the risk of pollution due to exposure of hazardous materials. Another research by Mahmood, et al (2013) indicated that Malaysian ISO 14001 certified manufacturing companies improved manufacturing performance leads to an integrated green supply chain as well as it causes enhancement of environmental compliance, optimization of operational resources and product recycling activities.

Another study by Hsu, et al (2013) studied green supply chain initiatives and investigated the barriers in context of SMEs in Malaysia. The study confirmed GSCM drivers are influencing manufacturing firms to take green supply chain initiatives. Moreover, research findings showed that competitors pressures as the strongest factor and socio-cultural is the weakest factor among the green supply chain drivers. Kuan & Udin (2011) analyzed the impact of reverse logistics and electrical and electronic companies in Malaysia. The findings stated that Malaysian manufactures are not proactive in gaining advantage of product take back and processing activities as they are considered cost oriented services. It also revealed most of the companies that provide reverse logistics programs are subsidiary companies of multinational corporations and majority of local establishments have not obtained certification for environment.

Another study Eng et al (2006) explored the impacts of EMS certification on the performance of firms, including economic and environmental aspects and perceived customer satisfaction. Results showed, EMS certification positively effects both environmental and economic performance. Moreover, strongest outcome of EMS was the improvement in corporation image. It was also found from the research benefits of EMS certification are more worthy than its cost of implementation.

Wooi, & Zailani (2010) investigated GSCM initiatives and the barriers in context of Malaysian SMEs. Results of the research presented low adoption level of green supply chain initiatives in SMEs, resource barrier was found key barrier which impedes the adoption of GSCM initiatives followed by technical barrier. Besides that, the firm that operates in family oriented business strategies has lower adoption level of GSCM compared to business oriented firms. Moreover, the motives in implementing green productivity among EMS 14001 certified companies in Malaysia. They concluded that green productivity can increase product quality reduce waste and pollution, and reduced risk. It was also found, green productivity does not reduce manufacturing cycle time, unit manufacturing cost, absenteeism but it increase healthier environment.

3. RESEARCH DIRECTIONS

GSCM has been focused by academicians as well as industrialists. Remarkable research addressed drivers, practices and outcomes of GSCM. Significant research has been done in developed countries range from supplier selection which includes all direct or indirect stakeholders of supply chain. Being developing country Malaysian government and other authorities are striving for the implementation of GSCM. Green initiatives are taken by the industries in response of pressure for implementation of green practices from different sources together with incentives offered by government. Although, previous studies has been conducted on GSCM in terms of initiatives, drivers, barriers, practices, and outcome, the impact of these studies is yet to manifest in practices towards improving GSCM performance and eventual adoption by the key industries players among SMEs. Drivers or the pressures for the implementation of GSCM are almost similar in developed and developing countries, but in term of effectiveness, type of drivers may vary from one to other country. Hence, further research need to explore substantially the extent of GSCM adoption in developing countries like Malaysia. It is inevitable for the authorities to find which types of drivers are more effective to implement GSCM and what type of drivers needs to empower to achieve environmental goals. Barriers in the implementation of GSCM has been explored, but still there is a need to enhance the research about the barriers for the implementation of GSCM which will provide a better understanding about the problems of GSCM implementation and it will also provide direction to review policy for the implementation of GSCM.

GSCM practices are the key contributor toward the successful implementation of GSCM. Internal environmental management is the first step toward the implementation of GSCM, while

Eco-design is the combination of LCA and DfE approaches which are used in green design. Several researchers used green purchasing, cooperation with customer and investment recovery practices to explore the impact of mentioned practices upon environmental, economical, operational performance outcomes generally but lack of research exist about green information system in Malaysian manufacturing industries, it is highly needed to enrich the research about green information system as information is the main stream of communication between departments and stakeholders of a firm. Recent research is addressing green marketing and green human resource practices and trying to find the impact of these practices on performance, if such kind of research is conducted in Malaysia it may help to boost implementation of GSCM in industries. Lastly, it would be of great benefits to explore the motives of GSCM practices in other to provide an in-depth understanding of the benefits to be achieve in terms of an enhance GSCM performance.

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