

# Green Supply Chain Management in Food Retail Industry: An Exploratory Study

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**Abstract** - Green Supply Chain management (GSCM) has been the focus of many scholars and researchers in recent years, all with a common interest to determine how companies' performances are being improved with the adoption of GSCM [1]. However, in most of the studies conducted by researchers, they are mainly concerned with the GSCM in manufacturing industry and less attention was given to the food retail industry. Therefore, this research is relevant and intend to explore GSCM further, especially in the context of Malaysian food retail industry so that the results from the findings will be applicable for food retail stores to contribute to improving the companies' performances through GSCM. Although, this is the first stage exploratory research from relevant literature within this area, the paper presents the proposed conceptual framework and the research hypothesis to further expand upon in the future research studies.

**Keywords** – Green Supply Chain Management (GSCM), Green Logistics, Food Retail, Waste Management.

## I. INTRODUCTION

The overall growing concern over environmental issues had further emphasized on the importance of incorporating green and sustainable practice in the supply chain management. Having this new concept, GSCM encourages production of more green products alongside improving the integration of suppliers with environmental issues [2, 3]. Over the years, the study of GSCM had often explored in the industrial sector and hardly in other sectors such as the food retail industry. In recent years, researchers had started to focus on adopting green and environment friendly concepts in the service industry rather than manufacturing industry [4]. Therefore, research relating to GSCM, and food retail industry began to surface. Earlier research highlighted that there is growing interest on the relation between GSCM and food retail industry because food and beverage industry act as a primary industry that is most suitable to mitigate environmental impacts [5].

## II. LITERATURE REVIEW

The main purpose of conducting this literature studies is to examine the important observed research to identify various aspects of green supply chain management. Secondly, the studies also aim to determine the practices and methods adopted by manufactures and good retail sectors. Retailers are responsible for all supply chain

processes [6]. The link between in-store activities and logistics had been identified by [7] as a major aspect to research on retailing. This finding was later affirmed by [8] through a list of sustainable retailing measures. It was then detected that the measures focus on energy, water, and waste management. Some retailers do not pay serious attention on the importance of water and energy management and the impact to the environment. However, water management is important in food retail stores especially in the areas where hygiene standards are prioritized. Besides water, energy management is also one of the important in-store processes that associates with keeping the environment green. In food retail industries, energy management play an important role when it comes to temperature regulating for food products such as chilled and frozen food. Another study [9] had further confirmed that the key drivers of carbon dioxide gas emission in Malaysia are economic growth and energy consumption [9]. As the industrial sector contributes to the Malaysia's economic growth, research suggested that it was not likely to reduce energy consumption as doing so may affect the economic growth to dwindle as well. The researchers suggested that energy saving methods should be emphasize and policy makers could look on other alternatives such as investing in exploratory of the renewable energy sources [9].

In Malaysia, according to Solid Waste and Public Cleansing Management Corporation), there are approximately 16,650 tons of food waste dumped daily in landfills. In fact, the amount of food waste tends to increase by 15-20% more especially during festive seasons [10]. This food waste disposal method is beginning to raise concern of the authorities because the improper food waste management will create negative impact to the environment as greenhouse gas emission is increased due to high amount of methane and carbon dioxide produced because of natural decomposition process [11]. To tackle the issue of excess food waste, the Standard and Industrial Research Institute of Malaysia (SIRIM) had come up with some projects with the effort of converting these food waste to generate sources of energy. Besides, food waste could also be transformed into useful organic fertilizer to combat food waste issue. However, efforts from the government and NGOs will not be enough. The society should play their part and be aware of the importance of food waste management for the betterment of the environment and future generations [12].

### A. *Green Supply Chain Management (GSCM)*

The public has become more aware about environmental issues happening worldwide in recent years and have directed the focus onto GSCM by integrating green concepts and practices into the traditional supply chain management. The main reason that drives the greening of supply chain in organisations is to address the environmental burden caused by the industry and its operations [13]. For efforts of greening the supply chain to be effective, it also depends greatly on the organization nature. There are various green supply chain practices that were identified and followed in practice in the manufacturing industries. This study intends to focus more on GSCM practice in terms of cooperation with customers, green purchasing and eco design.

Customer cooperation in supply chain is the extent where two parties collaborate with a mutual goal to achieve sustainable outcomes [14]. In fact, customer pressure would exist within this collaboration and play a role in influencing the organisation in adopting GSCM [15]. Developing a close cooperation with customers is encouraged as this collaboration could enhance and strengthen green innovations in supply chains. This approach would create a win-win opportunity to meet customer demand and improve sustainability effectively. Besides that, new green innovations would surely assist firms to stay competitive in the market among their competitors [16]. The cooperation with customers would also be able to contribute positively to the food retail industry as interactions with customer is crucial in the aspect of setting environment goals and plan together with efforts of reducing environmental impact. According to studies [17], there will be a direct involvement of organisation with its customers for environmental collaboration and this will bring about joint development of environmental solutions.

Green purchasing is one of the preliminary steps in addressing global environmental concern because the basics of purchasing is about acquiring the correct materials in the correct quantity or quality and at the correct time and place [18]. More specifically, green purchasing is simply acquiring environment-friendly or green products or services [19]. Nowadays, green purchasing appears to be an important component of environmental and supply chain strategies. Due to consumers' rising concerns over the environment, purchasing companies had stressed on the role of purchasing functions in improving the environmental performance by integrating environmental aspects into business and organisational dimensions in making purchasing decisions. To ensure that purchases are green and benefits the environment, the practice of green purchasing is already introduced and implemented in the industries. Green purchasing creates awareness in purchasing activities by considering waste reduction and at the same time encouraging the effort of recycling and reusing certain materials [20]. The green products

approach is still relatively new in Malaysia [21]. There is limited research available for reference which relates to green consumer products. Therefore, it is worthwhile exploring green purchasing especially in food retail industry, in terms of waste reduction and purchasing of eco-friendly machineries and materials for food production processes with the aim to control the number of toxic gases being released into the environment.

The eco concept in manufacturing a product considers the aim to reduce a product's environmental effects throughout the entire life cycle [21]. It is close to impossible to design a product which does not have any impact at all to the environment, but at least, with this strategy, the eco-design approach would contribute to achieving a more sustainable future [13]. In recent years, companies are already seriously looking into producing eco-designed products to maintain competitiveness in the market, based on consumers' changing perceptions, needs and preferences. Furthermore, the concept of eco-design also serves as a great opportunity for companies to achieve their goal of replacing harmful and hazardous materials used with materials that are more environment friendly. In the food retail industry, the GSCM eco design practice plays an important role especially in the production of eco products or packaging which have the reusable and recyclable attributes. In a review [18], researchers highlighted that the adoption of eco-design practice had significantly reduced the negative impact on the environment thus improving the company's ability to contribute towards sustainability. Engaging suppliers in collaborative programs on eco products designing can sometimes lead to introduction of new innovative ideas pertaining to environmental technologies and materials.

### B. *Performance Outcomes*

In the present, the attention is now churned towards balancing between business and environmental challenges and requirements. There has been on-going research that discover and explore the impact of GSCM on performance outcomes which interlinks environment and economic performances [22, 20]. However, the interlink study of GSCM on environment together with social performances are rarely found in the industries. Therefore, this study will focus on discovering the impact of GSCM on both environment and social performances in food retail industry.

Environment performance can be evaluated based on a company's resources consumed, regulation compliance level, processes, products, and services towards the environment [23]. The environmental performance can be measured in terms of reduction of poisonous gas emission, solid wastes and hazardous material consumptions created by activities in the supply chain network. As there seem to be a significant connection between environmental performance with supply chain management. The implementation of GSCM will improve the environmental performance for both the firm itself and to the suppliers or customers that conform to

environmental regulations [24]. As there is demand for environmental performance, firms had to evaluate their performances by taking the initiative to improve on their capabilities in this aspect. Other studies mentioned that there could be positive effects on environmental performance should companies focus more on both corporate environmental management and GSCM [23]. To enhance environmental performance, [25] suggested that companies should engage in environmental collaborations and monitoring with the suppliers and customers at the supply chain level. Therefore, this study investigates whether there will be a similar positive impact of GSCM on environmental performance specific to food retail industry.

Social performance in general can be perceived as a measure of social related issues that brings about the attention of the society [26]. There are various social related concerns that a firm should consider along with the implementation of GSCM practices. According to [27], even though social performance is recognised for its importance, however, studies on this aspect is rarely found with the reason being that it can be quite a challenge to measure this performance based on social indicators. Social issues found in supply chain was defined by [28] as the effect of product or process-related aspects of operation on human safety, welfare, and community development. As there could be other metrics of measures possibly available for evaluating social performance, the metrics could be identified and selected by different dimensions [29]. Due to the limited number of studies available for reference, the impact of GSCM on social performance is yet to be assessed in this study that focus on food retail industry and the findings will be reported accordingly.

### III. PROPOSED RESEARCH FRAMEWORK

For many years, there are many studies carried out that highlights the importance of the relationships among experiences, the green supply chain management practices, and firm's performances [30, 31]. Only a few similar works were done in the context of food retail industry [20, 32]. However, detailed analysis was carried out on different sets of relationship between the individual antecedents with individual GSCM practice and, individual GSCM practice with individual variables of performance outcomes. This research studies provide the importance of various attributes of green supply chain management practices and the performance variables. Hence, the study intends to contribute to a continuation of the previous research results and step up to the next level by identifying and verifying the relationship and impact of GSCM on other performance outcomes, in this case is environmental and social performances. The core of this study can be represented with a simple conceptual framework to connect the variables of interest. In this case, the backgrounds here are the in-store logistics referring to environmental and waste management. These two backgrounds encourage further implementation of

GSCM practices which are cooperation with customers, green purchasing and eco-design that forms the central structure of the framework. The final part of the study will relate to the performance outcomes, environmental and social performance. There are multiple individual relationships to be investigated and each one is represented as an individual hypothesis. The in-store logistic measures are assumed to directly drive the practice of GSCM thus forming the hypothesis to be explored in future research. The conceptual framework summarised by the individual relationships of study indicated by the arrows connecting the variables.

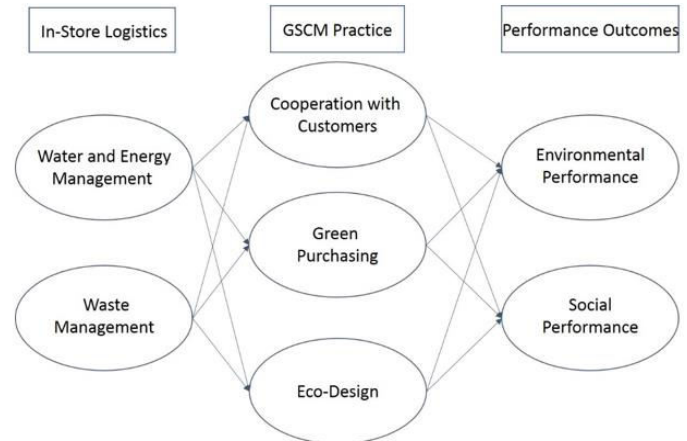


Fig. 1. Research Conceptual Framework

- H1a – Water and energy management positively affects cooperation of customers.
- H1b – Water and energy management positively affects green purchasing.
- H1c – Water and energy management positively affects eco-design.
- H2a – Waste management positively affects cooperation of customers.
- H2b – Waste management positively affects green purchasing.
- H2c – Waste management positively affects eco-design.

The above connection formed between in-store logistics and GSCM practices are further extended to link the relationship with the environmental and social performance of the firm. It is believed that the cooperation of customers, green purchasing and eco-design should lead to improving the environmental and social performances. Thus, the formulation of the remaining hypotheses as:

- H3a – Cooperation with customers positively affects the environmental performance.
- H3b – Cooperation with customers positively affects the social performance.
- H4a – Green purchasing positively affects the environmental performance.
- H4b – Green purchasing positively affects the social performance.

- H5a – Eco-design positively affects the environmental performance.
- H5b – Eco-design positively affects the social performance.

#### IV. CONCLUSION AND FUTURE RESEARCH

With the limited number of earlier studies found studying green supply chain management (GSCM) within food retail industry, a preliminary conclusion can be drawn that even though GSCM is widely known and implemented in companies, it could rarely be taken for the food retail industry. The in-store logistics that are potential impacts on GSCM practices were identified and justified the importance of implementing GSCM practices in business and organisational operations. However, there are various GSCM practices that a company can adopt depending on their organizational needs, business functions and nature. In this study, three GSCM practices such as cooperation with customers, green purchasing and eco-design are chosen as the focus due to these variables are important components to be concerned of in the company when incorporating green concept in the organisation. Past research revealed that GSCM practices tend to affect environmental performance in the industries. However, limited evidence was found relating to social performance as not many studies were done in the aspect. Therefore, in food retail industry, the findings obtained at the end of this study shall be able to provide a better picture whether GSCM practices are able to contribute on improving company's performance outcomes.

This research focuses on food retail industries in Malaysia. However, the area of study in Malaysia itself is too wide. Being a country comprising of 14 states, the area of study for this research has been narrowed down and Penang is selected as the prime location for data collection. Penang is well-known for being the food capital of Malaysia, thus food retail industry tends to occupy a relatively big market. In fact, Penang was also previously reported as one of the top three states with the highest retail sub-sector occupancy. There are several studies that explored the concepts of GSCM, including its implications and applications. In Malaysia, studies related to GSCM in food retail industry is indeed very rare. This research, in trying to establish the association between green in-store logistics and food retail industry performance outcome due to the implementation of green supply chain management, produces the results that should contribute to enhancing the management focus on adopting green concepts and cultures in supply chain management of food retail industry. The study aimed to identify various aspects of green supply chain management practices through comprehensive review of literature based on the outcomes of various studies carried out within the context of food retail and food manufacturing environments. Through our study it was noted that many researchers have proposed different framework based on the specific criteria and attributes

within their context, and one which can be taken as the basis of future work for our research studies. One of the other aspects for future research could also examine the managerial and strategic implications on the adoption of GSCM practices within food retail sector. It should aim to inform and provide key decision makers, including management on any patterns of observations and practices to be adopted by retailers. Businesses could be able to explore any drivers and barriers towards adoption of these methods and frameworks to enable them towards their future retail practices and user experiences towards green practices. Finally, like any research or conceptual studies, our study also has few limitations. Although, our study adopted a systematic approach towards researching the existing knowledge and articles, the authors do envisage some gaps that could be further explored by future research studies. For example, a social dimension study on the impact and behaviours of individuals and users from different cultural, social and usage backgrounds can be explored in future. Similarly, demographic, and behavioral studies may also be explored as a dimension in the future. Future researchers and studies are encouraged to focus on both conceptual and empirical studies to further examine and evaluate the concepts of green supply chain management practices.

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