

Green Supply Chain: Challenges and Practical Issues

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Abstract— This conceptual paper aims to identify the challenges and practical issues in green supply chain management. Besides that, the established theory in adoption of green business practises are also pointed out to illustrate the complexities and practical issues arises in the process. The research emphases on the factors which hinder the success of green supply chain operations. The paper has revealed the challenges and issues arise due to conflicting objectives and limitations of measurement methods. The future research would be the opportunity to describe the market acceptance to the green businesses as well as practical measurement method to enable forecasting of the profits and strategic objective formulation. The findings will provide overviews on solving supply chain issues in implementing green supply chain practices. In the long run, the management practices will enhance the performance across the supply chain entities.

Keywords— *Supply Chain, Green, Sustainability, Profitability, Government Role, Market*

1. Introduction

Since the end of the 20th century, the “green” and “eco-friendly” business concept sparks from the public concern about economic development sustainability. Soon after that, the growing environmental issues awareness resulting from the depletion of natural resources and worsening environmental quality urged the business to adapt the green initiatives. In the recent years, green supply chain management (SCM) has been given high attention by many organizations [1]. The green concept in business covers various aspects including in the supply chains. The approaches to implementing green supply chain includes the efforts in minimizing the negative impact on the environments. Sustainable Business Models which focuses on stakeholders, environment and social have the potential to deliver the required improvements via innovating the way a value chain is created till capturing of this value[2]. The focus on green supply chain should involve the cooperation from the suppliers and customers, internal operations and process analysis, environmental considerations in the process of product development and extended supervision throughout the product life cycle [3]

On the other hand, even to-date, the green business concept element is rather ambiguous as proven by the variety of definitions founded in the literatures. Moreover, green

business practices are still not being collectively incorporated and applied by the business entities all over the world. This situation takes place due to some reasons, including the fact that the “green” move is largely perceived will increase costs or reduce the revenue besides cultural, political and economic gap issues.

In supply chain flow, the lean concept production is considered as “collection of waste reduction tools”[4] This concept is often perceived to be compatible with green concept for the shared focus on waste reduction. However, there are inconsistencies in the middle of those two strategic initiatives. For an instance, the lean initiatives that engage Just-In-Time (JIT) deliveries could increase transportation, packaging, and handling which may be in conflict with the green concept. Firms may be failing to specify the significant trade-offs between those two strategic initiatives.

Firms should recognize the conflicts in their strategic initiatives in the direction of being able to identify the trade-offs and develop resolutions in mitigating the adverse consequences and accomplishing both lean and green objectives.

1.1 Purpose of the Article

The purpose of this article is to identify the challenges and practical issues in implementing green supply chain based on the respective literatures. Then, it will provide a research agenda to address challenges and practical issues in implementing green supply chain for future research to assist in decision making.

1.2 Research Approach

An extensive review of the literature in green supply chain strategies was conducted based on the journals, books, articles, reports as well as web sites. The articles are collected through multiple resources, including the libraries, EBSCO Business Source Premier, JSTOR, Emerald Insight, Elsevier Science Direct, Wiley Interscience and Springer Link.

The reviewed literatures, then are analyzed by listing the characteristics of green supply chain presented by each author. The idea is that the challenges, implementations, and practicality issues of executing green supply chain stands as the main focus.

3 Literature Review

3.1 Definition of Green Supply Chain

The definitions of 'green' in business practice are repeatedly assumed to be synonymous with 'sustainable'. However, the literature has wide understandings about sustainability. Sustainability can be classified according to the area of perspectives.

Most of the understandings can generally be grouped as the dependence to survival while taking into consideration about reliance to the resources. The 'survival' and 'resources' are the main fundamentals in defining sustainability. From long-term economic perspective, being "Green" will allow natural resources to be preserved and eventually lead to business sustainability [5]

According to Brown and Ratledge, the definition of 'sustainable' is simplified as "an establishment that produces green output" [6]

Thus, from the definitions, the concept of creating a green supply chain will eventually promote the business sustainability over the extended period of time. Survival is the most supreme intention for business while making profit. Defining the relevance to business still exist in the market, it is quite challenging if the resources are unexceptionally scarce.

The needs to preserve resources are crucial for survival as the facts that it depends on the resource availability. As such, the idea of organizing the survival should be the priority in creating sustainability.

In *The Business Dictionary*, the term 'green business' is identified as "a business functioning in a capacity where no negative impact is made on the local or global environment, the community, or the economy" and further adds that "green business will also engage in forward-thinking policies for environmental concerns and policies affecting human rights" [7].

Meanwhile, supply chain as defined by Mentzer, is an interorganisational relationship among businesses [8]. The activities are mostly revolving among businesses to other businesses and finally reaches the consumer as a final product. This interdependence relationship has big influence on the production effectiveness in providing services to the customer at the most precise time.

In a book by Makower and Pyke, it was stated that green business would require a well balanced commitment in achieving profitability, sustainability and humanity [9]. Their main objectives should be synchronized among the firms to avoid breakdown somewhere in the middle of the process and mismanaged process will result in huge impact of the idea.

Another author in an article has proclaimed that business that implements the green practices will have more sustainable business compared to the competitors who don't. It would not only benefit the business itself, but also the natural systems and promotes better lifestyle while making profits and contributing to the economy in totality [10].

Generally, supply chains are understood as the network of entities which are directly or indirectly interlinked among each other. These entities are interdependent to serve the customers. Without any of the entities in the network, the end product would not be able to reach the targeted customers at the location, time and price they wish.

Thus, in order for businesses to implement green supply chain strategies, the managers should look beyond their own box while bearing in mind, the effect of the activities in the entire supply chain. All of the supply chain participants should work together in providing positive impact to the environment.

4 Green Business Challenges and Practical issues

As the proverb says, "No pain, no gain". Any aspirations will come together with the challenges. The challenges should be engaged as a mean to improve the method used to reach higher levels of success. In long run, the challenges will eventually be the strength of the vision.

4.1 Firm Profitability

Deciding to make changes in the business practices will somehow affect profitability. Sensibly, the managers will hinder changes to maintain, what they have believed as their most optimal profits. The same idea goes to implementing green business practices.

Fortunately, the green business operation idea has been widely accepted by the business stakeholders. From the researches and studies made over the years, green businesses have proven to influence the economic performance as well as the environmental enhancement [11].

The implementation of green business, will transform some of the established business models. This transformation will also lead to major challenges. The firm will have to invest more to solve the differences between the modes such as skills and infrastructures. In contrast, the new business model will open up new opportunities for the firm to explore new markets and serving new groups of customer [12].

Previous studies have proven that companies that implementing sustainable business practices has been taking advantage of the sustainable revenue opportunities. The Department for Business, Innovation and Skills imply that,

the UK green economy has grown from 4.9 percent to 5.5 percent a year by 2015 [13].

4.2 Market

Determining the right market for green products and services is essential before deciding in positioning the products in the market. To define 'green consumers', there are a few different lists of green consumer features, described in the literature. In the book of Principles of Marketing, the consumers' characteristics are differentiated by four categories, namely, demographic, socioeconomic, psychographic and behavioral [14].

There are studies that have concluded that females are more environmentally conscious compared to males who hesitant to spend more on the green products [15]. However, the significance of the differences was not stated in the literature.

On the subject of consumers' socioeconomic characteristics, the green products attract mostly higher income and well educated patrons. A study argued that the higher educated individuals are often to have higher income and have more willingness to adapt to innovations [16].

Similarly, education level and psychographic characteristics are very much associated. The individuals with higher education are more conscious about ecology and environment. They responded to the awareness by means of ethics, responsiveness and way of thinking behavior.

Consumer behavior is usually influenced by the attitudes and convenience. During the decision making in consuming environmentally friendly products, naturally, the consumers will tend to be concerned with their personal needs first before others [15]. Moreover, the idea of being environmentally friendly is considered as inconvenient as it requires lifestyle changes and incurs extra expenses.

However, the behaviors are slightly different when the individuals flock together and forms a group of people. The group tends to adopt the environmentally friendly behaviors in response to the general public interests. This group of people usually has huge influence on the policies and course of action [15].

4.3 Government Role

The citizens' behaviors are usually regulated by the government. The government has authority on the regulatory outline in business operations. Restricting the environmentally harmful business activities contributes to the green business practices. Penalties, tax and procurements are the tools for the governments to apply in promoting green business initiatives.

Indisputably, green businesses have widely spread and become a global strategic necessity. This has urged the

governments to develop policies and corporations to take advantage of generating strategies in implementing green business practices. However, poor understanding eventually leads to confusion, disagreement and dispute among the supply chain entities that supposedly work together towards shared goals [16].

4.4 Conflict in Achieving Strategic Objectives

Every business has underlined their own strategic objectives in driving the success of the company. However, due to the involvement of huge number of entities in a supply chain, some of the businesses encounter conflicts among themselves in attaining their strategic objectives and fulfillment of the green supply chain objectives [18].

The conflicting of goals in achieving sustainable business practice objectives is frequently mentioned in the literatures. Managers are encountering dilemmas in implementing the Green Business strategy while keeping up with the other objectives [19]. The same author has previously highlighted about environmental practices among the transnational corporations and comprehends about the conflicting points between green and global supply chain strategies [20]. The conflicting goal is illustrated as the buyers prefers least product cost, however the suppliers have to spend more on providing robust environmentally responsible products.

As described earlier, implementing lean production could jeopardize the green effort. Even though the lean concepts sometimes complement the green concept, but some managers may not be able to identify the most optimal solution in executing both contradictory initiatives. Proper guidelines and measurement techniques could assist the managers in decision making and simplify the analytical attempt.

Besides that, a measurement approach across the supply chain is necessary, since the early decisions will influence the future performance. Forecasts can be made to predict the performance of the conflicting objectives.

5 Discussions

This conceptual paper has in brief expressed the challenges encountered by the supply chain managers in achieving the green supply chain objectives. However, there are still some limitations in this paper. It relates to the external operating factors that might influence the outcome of the green supply chain practices. Still, too broad research scope is unfeasible with limited resources.

Even though the literature has discussed about the challenges and issues in the business implementation, however, it did not concentrate on the application tools that can be utilized. Managers should understand that, by implementing green supply chain practices can lead to business efficiencies. Awareness and appreciation among

the managers in implementing green business exercise will promote efficient assessment.

The concept of green supply chain is still somehow unclear and broad. The principle is, however understandable by minimizing the negative environmental impact in the business activities collectively.

5.1 Agenda for future researches

For future research, it is suggested to include an empirical measurement method as to give more practicable results. The practical measurement technique will not only benefit managers, but also assist in future research. The simultaneous implementations of strategic objectives should be assessable for better understanding the correlation available in dealing with conflicting objectives.

The firm's profitability from implementing green supply chain practices should be clearly highlighted and measured. The result could encourage managers to further imply the greening efforts and promote improvements in an anticipation for better business profitability.

Market acceptance to the idea of green business practice should be further discussed as the markets possess the power over the business development. Rationally, consumers prefer low cost and high quality products. However the greening efforts could incur more cost in manufacturing and operational process. Some products might have lower quality, due to sustainable activities. The method to encourage the market to approve green products such as production and process improvement should be taken into consideration.

Future research should also identify the external environments that could influence the sustainable business effort. For example, the political and government role in encouraging green business practices are not comprehensively discussed. The research should suggest some theoretical solutions which can be utilized in the decision making process.

6 Conclusions

As the world becomes increasingly aware about the sustained support in preserving the nature, green supply chain practices will give the opportunity for businesses to take full advantage in the effort. The business will also acquire competitive advantage in the complex supply chain system.

Managers should be well equipped in creating agenda to integrate the green business practices in their daily routine. The practical tools and guidelines will enable managers to plan the strategies successfully and collectively across the supply chain.

In a nutshell, to successfully implement green supply chain practices, the managers should cooperate among each other to achieve the desired outcomes while considering the market demand. Governments could highlight guidelines and regulations to help in the synchronization of the initiative collectively. Green supply chain practices are perceived to benefit not only the businesses, but also the environment in a holistic manner.

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