

A Review on Drivers and Barriers towards Sustainable Supply Chain Practices

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Abstract—The rising environmental concerns are encouraging consumers to have greater awareness of their purchase decisions. Firms are implementing measures geared to offering green substitutes for traditional products and services. However, the effort towards sustainable supply chain management (SSCM) is not as straightforward since organization would face obstacles. The aim of this paper is to identify the barriers and drivers towards the implementation of the sustainable supply chain management (SSCM). Through the review of the literature, it was found that there are various factors that have been documented to influence an organization in making the decision towards SSCM implementation.

Index Terms—Green, sustainable, supply chain, drivers, barriers.

I. INTRODUCTION

Previous research suggests that the implementation of environmental initiatives for any company is an expensive cost which trickles down through all levels of the firm [1]. Consumers and companies alike are consequently have to be more willing to pay premium prices for green alternatives [2]. As with manufacturing firms, management is concerned that commitment to green initiatives will reduce profitability at the expense of actual environmental performance [3]. Besides that, managers' commitment to environmental investments in new greener markets will provide the firm with the innovation to gain a competitive advantage quickly [3]. Several multinational firms in diverse service industries have announced initiatives to going green in products sold, or in production processes. However, service firms consider the conflicts of diverse stakeholders, including customers, employees, suppliers, regulators, governmental agencies, and stockholders and their reactions to make green initiatives.

These groups establish conflicting priorities for management's policies - high return on investments, high quality products and prolonged profitability [4]. Thus, organizations face barriers and drivers to sustainable supply chain management [5], and these can be either internal or external challenges to the organization [6], [7]. The objective of this paper is to highlight the drivers and barriers towards sustainable supply chain practices by firms.

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II. SUSTAINABLE DEVELOPMENT

The term, sustainable development has evolved through the powerful lobbying of the environmental movement over the past 30 years. Bruntland's definition of sustainable development has become widely used. It defined sustainable development as invoking the needs of future generations counterbalanced to the current unmet needs of much of the world's population [8]. As a general concept, sustainable development encompasses three fundamental approaches: economic, environmental, and social developments, which are interrelated and complementary [8].

The focus of research in sustainability has shifted from local optimization in a single organization to that of the entire supply chain [9], [10]. Moreover, sustainability has become a lasting movement that has started to impact on how we do business, buy products and even choose our leaders. Environmental sustainability is a key issue for human societies throughout the 21st century's world. It can be defined as meeting the needs of the present without compromising the ability of future generations to meet their needs [11]. As environment sustainability is attracting more attention, the literature on SSCM practices focusing on environmental performance has created a stream known as green supply chain management [12]. It is not simply about reducing the amount of waste of production or using less energy, but is concerned with developing processes that will lead to businesses becoming completely sustainable in the future.

The communities must not only be environmentally sustainable, they must be also socially sustainable. [13] state that social sustainability should be seen as: "A process for creating sustainable, successful places that promote wellbeing, by understanding what people need from the places they live and work. The literature has addressed the social dimension of sustainability by investigating various social aspects such as community issues, corporate governance, diversity considerations, employee relations, human rights and diversity, educational and ethical considerations, training and development and safety [14]-[16]. It is far more difficult to quantify than economic growth or environmental impact and consequently it is the most neglected element of triple bottom line reporting. Despite the business is large or small, they can actually contribute to social sustainability such as to improve local and global social conditions of workers, their families, communities and society at large.

Economic sustainability assesses various aspects of SCM focusing on ensuring healthy cash flow, good profit margins and a proper return on investment, business performance improvement and competitive advantage [17], [18]. Based on the literature on the economics of sustainability, it

emphasizes utility, for which a value is computed [19], [20]. The costs of protecting the environment are frequently not onerous and in many instances, the cost savings from using resources more wisely and the reputational advantage in attracting customers from being known as a “green” organization increase organizational profitability [21], [22].

III. SUSTAINABLE SUPPLY CHAIN MANAGEMENT

The supply chain conceptually covers the entire physical process from obtaining the raw materials through all process steps until the finished product, directly or indirectly, reaches the end user as well as the associated information flows. In addition, most supply chains consist of many separate companies, each linked by virtue of their part in satisfying or fulfilling the specific need of the end consumer. In the supply chain, it is not only includes the manufacturer and suppliers, but also transporters, warehouses, retailers, and customers themselves. Supply chain management (SCM) concept had been initiated in 1980s.

The topic of sustainability in the context of SCM has been discussed using a number of terms in the literature. Sustainability has become a global concern and hence motivated organizations are revisiting their supply chain operations taking into consideration the environmental and social impacts of their supply chains [23]-[25]. In the recent years, this has given rise for the academic is embracing new term that most closely link sustainability and SCM concepts are green supply chain management (GSCM) and sustainable supply chain management (SSCM) [26]. From the study done by [27], the analysis results shows that integration of sustainability into SCM began by focusing on merging “green” considerations with SCM practices. Thus, SSCM is the extension concept of GSCM.

Ref. [28] defined SSCM as the strategic, transparent integration and achievement of an organization’s social, environmental and economic goals in the systemic coordination of key inter-organizational business process for improving the long-term economic performance of the individual company and its supply chain. In addition, [5] refers to SSCM as the management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development such as economic, environmental and social, into accounts which are derived from customer and stakeholder requirements.

People recognized that profits and profitability were the only element in the long-term success of businesses and the economic as the new economic order unfolded [29]. Also important are the stakeholders and the environment.

A. Drivers towards SSCM

SSCM incorporates with variety of concepts such as environmental or green supply chain, where firms seek to minimize negative environmental impacts in their supply chains. Firms differ in what causes them to engage in SSCM, with some firms being driven from within by their top management to engage in sustainable supply issues, and others responding reactively to external influences such as stakeholder pressures or customer requirements [30]. In this

situation, organizations could face barriers and drivers to implementation of SSCM [5], and these can be either internal or external to the organization [31], [32]. For instances, the causes that for firms to engage in SSCM can be varied, with some firms being driven from within by their top management to participate themselves or not in sustainable supply issues, and others responding reactively to outside influences such as stakeholder pressures, customer requirements and the like.

Some of the internal drivers are on broad organizational issues including having top management commitment [33] and a supportive culture [34], [35]. The involvement of employees is also beneficial [36] including middle management [37]. SSCM is also benefited by adopting an Environmental Management System (EMS) [38]-[40]. Proactivity in SSCM may lead to firm competitiveness [41], [42] or help manage reputational and environmental risk [43]-[46]. Looking more specifically at the purchasing and supply function, developing capabilities is important [12], [47], [48], and specifying a sustainable SCM strategy is of benefit [6], [36], and ensuring it aligns with corporate strategy [49], [50]. Other internal corporate social responsibility (CSR) practices can influence SSCM [51].

TABLE I: DRIVERS TOWARDS SUSTAINABLE PRACTICES

Internal Drivers/ Enablers
<p>1. People issues</p> <ul style="list-style-type: none"> i. Top management commitment [33], [66]-[68] ii. Employee involvement [36, 66] including middle management [67] iii. Culture [35] <p>2. Strategic issues</p> <ul style="list-style-type: none"> i. Alignment of company strategy with purchasing/ supply strategy [49], [50] ii. Company sustainable SCM strategy [6], [36] iii. Competitive advantage/ firm competitiveness [41], [42], [69] iv. Risk management: <ul style="list-style-type: none"> • Reputational and environmental risk [44]-[46], [70] <ul style="list-style-type: none"> i. Performance management: • EMS adopters [38]-[40] <ul style="list-style-type: none"> i. Organizational size [6], [33], [71], [72] <p>3. Functional issues</p> <ul style="list-style-type: none"> Purchasing and supply function: <ul style="list-style-type: none"> Capabilities within purchasing and supply function [47], [48], [73] Other internal CSR practices influencing SCM [51]
External Drivers/ Enablers
<p>1. Government</p> <ul style="list-style-type: none"> Government policy [43] Regulation [33], [42], [64], [66], [74] <p>2. Competitors</p> <ul style="list-style-type: none"> Competitors [60], [61], [66], [74] <p>3. Customers</p> <ul style="list-style-type: none"> Customers [45], [53], [54], [66] <p>4. Suppliers</p> <ul style="list-style-type: none"> Collaboration with suppliers [55]-[59] <p>5. Investors</p> <ul style="list-style-type: none"> Pressures from investors [65], [73] <p>6. NGOs</p> <ul style="list-style-type: none"> Influence of NGOs [45], [48]
Sources: Authors compilation.

External drivers come from a range of stakeholders. Large customers may influence smaller suppliers to meet SSCM practices [45], [52], [53], and exert pressure in the supply chain [54]. Collaboration with suppliers is important for

SSCM [55]-[59]. SSCM can enhance competitive advantage [60], [61]. Governments are influential through policy [62], [63] and regulation [33], [42], [52], [64]. NGOs exert pressure on firms [45], [48], as do investors [65].

Firms which behave proactively on environmental issues might be able to reap strategic advantage by foreseeing opportunities and problems throughout the entire chain. From the supply chain perspective, the market becomes a more plausible means of environmental improvement. From these observations, there are 3 main factors that relatively have high impact to an organization on the execution of SSCM which are (I) government, (II) employee and also (III) consumers. Table I summarizes the drivers for SSCM practices.

B. Barriers of SSCM

Moving to barriers to SSCM, a distinction can be drawn between large and small firms, with larger firms more likely to engage in SSCM [6], [33]. Generally, size is one of the most important firm characteristics expected to influence the adoption of green initiatives. According to [75], he also found that firm size is an influence factor for firm to practice on SSCM, bigger size firm tend to be more willing to participate in green supply chain initiative.

TABLE II: BARRIERS TOWARDS SUSTAINABLE PRACTICES

Internal Barriers	
1. People issues	i. Lack of management commitment [33]
2. Strategic Issues	i. Resources: cost [33] ii. Performance measurement: traditional accounting methods [77] iii. Organizational size: smaller firms [75] iv. Financial, Technical, Information, Managerial and Organisational [75]
3. Functional issues	i. Purchasing and supply function: a. Lack of training [79], [80] b. Lack of understanding of how to incorporate in purchasing [80] c. Other SCM priorities [81] ii. Lack of corporate structures and processes [7], [11], [32], [87]
External Barriers	
1. Government	i. Regulation [85]
2. Competitors	i. Competitive pressures [80]
3. Customers	i. Consumer desire for lower prices [82] ii. Poor supplier commitment [7], [68]
4. Media	i. Green wash [84]
5. Sectoral	i. Less regulated industries [33, 86]
6. Organization	i. Policy and Market Issues [87]
7. Technology	i. ICT [89]

Sources: Authors compilation.

Internal barriers include a lack of supportive corporate structures and processes [7], [10], [11], a lack of management commitment [33], [76], and a reliance on traditional accounting methods, which do not facilitate reporting on the

triple bottom line [77]. Additional, lack of top management commitment is a major reason behind failure of quality improvement efforts [78] in the execution of SSCM, and unless management is fully committed to service excellence, any improvement efforts are doomed to failure from the start [78].

A focus on cost reduction can run counter to SSCM [33]. Looking at the purchasing and supply function, SSCM can be hindered by a lack of training [79], [80] and understanding [80] and having other SCM priorities [81]. Moreover, increased investment in green products, however, concerns many buying firms which believe that greater commitment to environmental programs increases total purchasing costs and subsequently decreases their competitiveness. As the consequences, a firm’s strong environmental commitment results in added costs, which put the firm at an economic disadvantage as compared with other less environmentally responsible firms [33]. Another difficulty associated with formulating a green purchasing strategy is that green purchasing may reduce the pool of qualified suppliers due to stricter environmental quality standards [33].

External barriers include consumer desire for lower prices [82], competitive pressures [80], and “green washing” or PR exercise [83], [84]. Despite the growing attention, there have been criticisms and scepticisms of the adoption of environmental supply initiatives as being reactive to regulations [33], [83]. Government regulation can inhibit SSCM [86], as can a lack of commitment amongst suppliers [7], [67], and industry type [33], [86]. Table II summarizes the barriers of SSCM practices.

IV. CONCLUSION

A SSCM strategy requires companies to adopt environmentally friendly purchasing, including taking into consideration the purchasing of materials that consist of less environmentally harmful elements, the use of fewer materials and more renewable and recyclable resources to deliver to the end user. Along the supply chain, suppliers, management and customers can influence the practices of an organization to make development more sustainable for the future. Collaboration with suppliers is important for SSCM [55]-[59].

Strategy research suggests that changes come not only from the top, but bleed through every aspect of the company, concluding that managers have a duty to the environment [1], [90]. Meanwhile, employees’ commitment to environmental concerns may subsequently increase increasingly identify with the company’s objectives [91], [92].

In conclusion, several initiatives can be undertaken to help firms adopt SSCM. Furthermore, focusing on supply chains is a step towards the broader adoption and development of sustainability, since the supply chain considers the product from initial processing of raw materials to delivery to the end customer [10]. As business move towards sustainability as key for competitive advantage and higher performance, they will need to develop even more collaborative and cross-functional supply chain teams. They will also benefit from exploring new business models with their suppliers,

including opportunities for co-branding. As such, firms will need to continue to develop sophisticated new tools to measure and allocate the gains from sustainable practices among the supply chain's stakeholders. This will allow users to value the entire business ecosystems, which includes sustainability in assessing the total cost of an economic activity.

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