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Sustainable Supply Chain Management: Barriers and Solutions in Vietnam

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A B S T R A C T

Sustainable Supply Chain Management (SSCM) have received growing interest recently, especially in Vietnam. In this paper, we will conduct a short literature review regarding SSCM concept and other aspects. We will further explore the challenges and solutions associated with the implementation of SSCM practices in Vietnam. The paper identified the key barriers such as financial constraints, regulatory complexities, lack of skilled human resources, and problems related to external stakeholders. Despite these barriers, the paper presents several effective strategies for overcoming them. These include government support and incentives, increased investment in technology, capacity building and training programs, and fostering collaborations amongst stakeholders. The findings of this research offer valuable insights for policymakers, business leaders, and researchers interested in promoting SSCM in Vietnam, contributing to the country's sustainable development goals. The paper concludes by suggesting areas for future research, particularly the need for more quantitative empirical studies to validate and refine the proposed solutions.

Keywords: sustainability, sustainability supply chain management, sustainability supply chain management drivers and barriers.

1. Introduction

Vietnam, in the past few years, observes a significant shift in consumption patterns, with sustainable consumption emerging as a new trend in society. According to a Nielsen Survey (2023), a substantial portion of Vietnamese consumers now prioritizes sustainability in their consumption decisions. Data from Statista (2023) reveals that around 70% of respondents in Vietnam have reduced their use of single-use plastic, 80% are willing to pay extra for sustainable products, and 60% have adopted sustainable shopping habits. Additionally, Vietnam commits to sustainability in its pledge to achieve net-zero emissions by 2050, with key initiatives include: the enactment of Decree 06/2022/ND-CP that aims to reduce greenhouse gas emissions, to protect the ozone layer, and to establish a domestic carbon market; the release of Decision 01/2022/QD-TTg that involves the development and submission of sector-specific greenhouse gas inventories, and establishments to MONRE - the Ministry of Natural Resources and Environment; the Circular 01/2022/TT-BTNMT that provides extensive guidelines for implementing the Law on Environmental Protection, with a particular focus on climate change and the newly enacted Law on Environmental Protection's Extended Producer Responsibility (EPR) regulations. Consequently, adopting sustainable supply chain management (SSCM) becomes a necessity for businesses in Vietnam as they must respond to the shifting consumer preferences, and the government's sustainability commitment and regulations.

2. The concept of SSCM

The idea of SSCM has its inception traces back to the 1970s. For example, the pioneering work of Ayres & Kneese (1969) addresses early challenges related to balancing industrial metabolism and materials, with concerns regarding the chances of integrating 'residuals' back into the linear process from extraction to disposal. The work discusses solid and water pollution waste and delivers warnings about global climate change due to the emissions of carbon and other greenhouse gases, which were relevant in their arguments on evaluating the roles of inter-organizational relationships. Stern et al. (1973), similar to modern analytical instruments, include inventories of pollutants and their impacts in a process-chain evaluation model that utilizes mass balance for organizational and governmental decision-makings. In the 1980s, the idea of adopting environmental practices to gain competitive advantages emerges (Frosch & Gallopoulos, 1989), which precede the decade of SSCM managerial coverage (e.g. environmental issues in logistics (Szymankiewicz, 1993; Murphy et al., 1994), recycling in reverse logistics (Barnes, 1982; Pohlen & Farris, 1992), …) and formal conceptualization (Handfield et al., 1997, Narasimhan & Carter, 1998; Beamon, 1999; Gilbert, 2001). Nevertheless, it is not until after 2000 that SSCM becomes a topic of academic attention and interest (Srivastava, 2007; Seuring & Müller, 2008; Fahimnia et al., 2015).

According to Sarkis et al. (2011), there exists several variations of the term SSCM, include green (or environmental) purchasing (Min & Galle, 1997; Carter et al., 2000; Zsidisin & Siferd, 2001) and procurement (Günther & Scheibe, 2006), sustainable supply network management (Young & Kielkiewicz-

Young, 2001; Cruz & Matsypura, 2009), green (or environmental) logistics (Murphy and Poist, 2000; González-Benito & González-Benito, 2006), and sustainable supply chains (Linton et al., 2007), … The most common term, which is often used interchangeably with SSCM, is green supply chain management (GSCM). Since researchers explain SSCM and GSCM in different ways, both SSCM and GSCM does not have a universal definition; nonetheless, all definitions share similarities in characteristics. And, while both puts a strong emphasis on environmental issues, GSCM is a more narrowly focused term of SSCM as the latter considers economic focus and social focus as well (Ahi & Searcy, 2013). The table below lists some definitions of GSCM & SSCM.

Table 1: Definitions of SSCM and GSCM in literature

Source: Ahi & Searcy (2013) with supplementary definitions

GSCM	
Source	**Definition**
Handfield et al., 1997	Application of environmental management principles to the entire set of activities across the whole customer order cycle, including design, procurement, manufacturing and assembly, packaging, logistics, and distribution.
Narasimhan & Carter, 1998	A purchasing philosophy which is guided by two perspectives. One is reuse and the second is recycling of materials.
Beamon, 1999	Cooperative initiatives, taken by a central company among supply chain partners, to support the organization of eco management know how in the central company and the development of clean manufacturing techniques.
Gilbert, 2001	An integration of environmental criteria with the traditional supply chain network by redesigning purchasing policies and involving suppliers in the entire procurement process.
Zhu et al., 2005	An important new archetype for enterprises to achieve profit and market share objectives by lowering their environmental risks and impacts while raising their ecological efficiency.
Sheu et al., 2005	Combination of both the product manufacturing supply chain and used-product reverse logistics chain.
Vachon & Klassen, 2006	A strategy, which helps to minimize wastages in supply chain network.
Srivastava et al., 2007	Integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life.
Srivastava et al., 2008	Integration of sound environmental management choices with the decision-making process for the conversion of resources into usable products.
Lee & Klassen, 2008	A buying organization's plans and activities that integrate environmental issues into supply chain management in order to improve the environmental performance of suppliers and customers.
Albino et al., 2009	A strategic approach addressed to extend environmental measures to the whole supply chain.
Gavronski et al., 2011	The complex of mechanisms implemented at the corporate and plant level to assess or improve the environmental performance of a supplier base.
El Saadany et al., 2011	Reducing energy and virgin raw material usage and waste generation and increasing product recovery options. Greening usually refers to the forward supply chain functions such as production, purchasing, materials management, warehousing and inventory control, distribution, shipping, and transport logistics.
Wu & Pagell, 2011	An approach that aims to integrate environmental issues into SC management procedure starting from product design, and continuing through material sourcing and selection, manufacturing processes, the final product delivery and end-of-life management.
Gnoni et al., 2011	An approach that aims to integrate environmental issues into supply chain management procedure starting from product design, and continuing through material sourcing and selection, manufacturing processes, the final product delivery and end-of-life management.
Yeh & Chuang, 2011	Management between suppliers, their products and environment - the environment protection principle is brought into suppliers' management system. Its purpose is to add environment protection consciousness into original products and to improve competitive capacity in markets.

Sarkis et al., 2011	Integrating environmental concerns into the inter-organizational practices of supply chain management including reverse logistics.
Büyüközkan & Çifçi, 2012	A way for firms to achieve profit and market share objectives by lowering environmental impacts and increasing ecological efficiency.
Andiç et al., 2012	Minimizing and preferably eliminating the negative effects of the supply chain on the environment.
Gunasekaran & Spalanzani, 2012	An organizational philosophy which provides competitive edge to an organization.
Schrettle et al., 2014	A tool which helps to position company from a strategic perspective.

SSCM

Source	**Definition**
Jorgensen & Knudsen, 2006	The means by which companies manage their social responsibilities across dislocated production processes spanning organizational and geographical boundaries.
Carter & Rogers, 2008	The strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systemic coordination of key inter-organizational business processes for improving the long-term economic performance of the individual company and its supply chains.
Seuring & Müller, 2008	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, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements.
Seuring, 2008	The integration of sustainable development and supply chain management [in which] by merging these two concepts, environmental and social aspects along the supply chain have to be taken into account, thereby avoiding related problems, but also looking at more sustainable products and processes.
Ciliberti et al., 2008	The management of supply chains where all the three dimensions of sustainability, namely the economic, environmental, and social ones, are taken into account.
Font et al., 2008	Adding sustainability to existing supply chain management processes, to consider environmental, social and economic impacts of business activities.
Pagell & Wu, 2009	The specific managerial actions that are taken to make the supply chain more sustainable with an end goal of creating a truly sustainable chain.
Badurdeen et al., 2009	Involvement of the planning and management of sourcing, procurement, conversion and logistics activities involved during pre-manufacturing, manufacturing, use and post-use stages in the life cycle in closed-loop through multiple life cycles with seamless information sharing about all product life-cycle stages between companies by explicitly considering the social and environmental implications to achieve a shared vision.
Haake & Seuring, 2009	The set of supply chain management policies held, actions taken, and relationships formed in response to concerns related to the natural environment and social issues with regard to the design, acquisition, production, distribution, use, reuse, and disposal of the firm's goods and services.
Wolf & Seuring, 2010; Wolf, 2011	The degree to which a manufacturer strategically collaborates with its supply chain partners and collaboratively manages intra- and inter-organization processes for sustainability.
Closs et al., 2011	Reflection of the firm's ability to plan for, mitigate, detect, respond to, and recover from potential global risks. Risks involving substantial marketing and supply chain considerations include product development, channel selection, market decisions, sourcing, manufacturing complexity, transportation, government and industry regulation, resource availability, talent management, alternative energy platforms, and security.
Wittstruck & Teuteberg, 2012	An extension to the traditional concept of supply chain management by adding environmental and social/ethical aspects.
Turker & Altuntas, 2014	The addition of sustainability to traditional supply chain management processes, taking financial, environmental, and social impacts of firm activities into consideration.
Giannakis & Papadopoulos, 2016	A sophisticated process by which firms organize their CSR (corporate social responsibility) activities across dislocated manufacturing processes spanning organizational and geographical boundaries.

Khan & Qianli, 2017	The management of raw materials and reduction of waste from upstream to downstream, and after shelf life back to the upstream with the improvement of the environmental and social impact.

Despite the growing GSCM and SSCM literature, researchers have stopped constructing definitions for GSCM and SSCM. Rather, they concentrate on one of the two following streams: the relationship between GSCM and/ or SSCM on a firm's performance and factors moderating this relationship (Fang & Zhang, 2018). Additionally, contemporary works on GSCM and SSCM literature use the two terms interchangeably (see Fang & Zhang, 2018; Maditati et al., 2018; Koberg & Longoni, 2019; Tseng et al., 2019; Khan et al., 2021). In accordance with current research and following Table 1 above, when we discuss SSCM, we discuss the managerial instruments that help firms achieve their economic, environmental, social, and operational goals (or performance).

3. SSCM implementation: Drivers and Barriers

Firms decide to adopt SSCM practices only when there exist identifiable benefits. For example, costs reduction, which is considered one of the most significant reasons behind firms' strategic decisions, can motivate firms to invest in environmental supply projects (Green et al., 1996; Carter & Dresner, 2001; Walker et al., 2008), and, consequently, an increase in profit (Schrettle et al., 2014; Govindan et al., 2016). In addition to incentives, firms also embrace SSCM as a response to pressure. For example, compliance with legislations and regulations (Walton et al., 1998; Beamon, 1999; Min & Galle, 2001; Haverkamp, Bremmers & Omta, 2010; Alblas, Peters & Wortmann, 2014; Mzembe et al., 2016), pressure from the medias (Beamon, 1999; Walker et al., 2008; Seuring, 2013; Bai, Sarkis & Dou, 2015) or environmental advocacy groups (Hall, 2006; González-Benito & González-Benito, 2010; Caniato et al., 2012; Harms, Hansen & Schaltegger, 2013; Hsu et al., 2013). Such incentives, or pressure, are factors whose existence have an impact on whether firms decide to implement SSCM - they motivate and drive firms' decisions; hence, the term drivers. Drivers can be either endogenous or exogenous - Tseng et al. (2019) provides a list of 5 internal drivers and 4 external drivers of SSCM. For a more detailed categorization, Walker et al. (2008) suggests internal drivers to be organization-related and external drivers to be divided into 5 groups: regulatory, customers, competition, society, and suppliers. Maditati et al. (2018) categorizes 4 groups of drivers: 2-item environmental awareness (internal), 4-item regulatory requirements (external), 8-item internal motivators (internal), and 10-item external pressure (external). Saeed & Kersten (2019) divides external drivers into 3 groups: 6-item societal pressure, 5-item regulatory pressure, and 8-item market pressure, and internal pressures into 4 groups: 4-item corporate strategy, 5-item organizational culture, 6-item organizational resources, and 6-item organizational characteristics.

On the contrary, there are factors whose existence obstructs firms' adoption of SSCM practices - barriers to SSCM. For example, firms cannot successfully implement SSCM if their managers do not commit (Al Zaabi et al., 2013; Brandenburg et al., 2014; Giannakis & Papadopoulos, 2016; Khan & Qianli, 2017; Khan & Dong, 2017; Delmonico et al., 2018; Neri et al., 2018). In the same organizational context, inefficient communication (Seuring & Müller, 2008; Brandenburg et al., 2014; Neri et al., 2018), and lack of an adequate performance measurement system (Pagell & Wu, 2009; Al Zaabi et al., 2013; Dubey et al., 2015; Steward et al., 2016; Bhanot et al., 2017) are considered resisting forces to SSCM implementation as well. Nonetheless, there exist barriers that are more concerning to firms, one of which is the huge cost of SSCM adoption and/ or firms' financial constraints - barriers prevalent in contemporary works (Lambert, Knemeyer & Gardner, 2004; Carter & Liane Easton, 2011; Ashby et al., 2012; Qiang, 2015; Busi et al., 2016; Ansari & Kant, 2017; Chan et al., 2018; De Jesus & Mendonça, 2018; Khan et al., 2018; Jansson & Calberg, 2019). Tseng et al. (2019), in accordance with drivers' classification, provides a list of 10 internal barriers and 6 external barriers to SSCM. Kouhizadeh, Saberi & Sarkis (2021), with a focus on blockchain technology, approaches barriers from 4 different contexts, including: 5-item technological context, 7-item organizational context, 5-item internal environmental context and 5-item external environmental context. Gupta, Kusi-Sarpong & Rezaei (2020) suggests a categorization that is more closely related to SSCM, with 6 different categories: technological, economic and financial, regulatory and institutional, social and cultural, organizational, and market and networking. Recent work further includes 3 supplementary categories: supplier-related, information-related, and human resources (Gonçalves et al., 2024).

Interestingly, while top manager commitment proves to be an obstacle to SSCM in some study, others find it to be a driving force (Faisal, 2010; González-Benito & González-Benito, 2010; Giunipero, Hooker & Denslow, 2012; Bai, Sarkis & Dou, 2015). Similarly, communication, while being inefficient is a barrier, being effective is a drive (Zailani et al., 2012; Khalid et al., 2015). In addition, while cost saving, profit margin, … are metrics for firms' economic performance, and improvement of efficiency, quality, … operational performance (Maditati et al., 2018), they are also considered drivers of, or barriers to, SSCM adoption as mentioned above (Saeed & Kersten, 2019). Thus, there exists a complicated connection between SSCM drivers and barriers, and firms' performance. It is possible to transform barriers into drivers with appropriate solutions.

4. SSCM in Vietnam: Challenges and Solutions

Despite the promptly increasing interest in SSCM in Vietnam, there are several challenges to overcome until SSCM in Vietnam reaches its full implementation.

Chen, Huang & Do (2022), being the first study that models the barriers in adopting SSCM in Vietnam, provides empirical evidence (from the Vietnamese manufacturing industries) that financial constraints is the most concerning problem regarding Vietnam SSCM, with high investments and less return-on-investments, and non-availability of financial assistants as sub-hindrances. Their findings are in accordance with a significant portion of existing literature (see section 3). Resolving the problem requires cooperation between the Government, local authorities, and firms. First, the Government should consider

a reallocation of funds for sustainable innovation and SSCM implementation. While the Government shows commitment and seeks foreign assistance with technological transfers, we can do more by investing in environmental/ sustainability-related technologies to achieve long-run stability. Second, local authorities need to provide guidance, not only to SSCM financial supports, but also on how to implement prevention and maintenance strategies that help firms maximize their SSCM technologies and equipment's efficiency. Third, firms should implement manufacturing and packaging solutions that reduce, reuse, and recycle materials. They could collaborate with others to recycle products where possible. Firms can also build a pro-sustainability organizational culture that encourages employees to support SSCM and allows employees to be involved in deriving solutions for SSCM barriers. Finally, we must develop a long-term strategy for SSCM adoption that appropriate for the country, producers, and consumers.

Follow financial constraints, regulatory challenges pose the second-most substantial barrier to SSCM practices in Vietnam (Chen, Huang & Do, 2022; Do & Huang, 2023). There is a lack of uniform interpretation and application of regulations among agencies, and insufficient enforcement of intellectual property rights. Consequently, it is difficult for companies to comply with regulations related to SSCM, discouraging them from adopting SSCM practices. These conclusions are in accordance with several findings in literature. For example, developing countries, in general, suffer from an inadequate institutional framework that does not allow successful implementation of SSCM (Al Zaabi et al., 2013; AlSanad, 2018; De Jesus & Mendonça, 2018; Delmonico et al., 2018; Durdyev et al., 2018; Greenland et al., 2019). In addition, when regulations are not pressuring enough, it creates a barrier to SSCM activities of firms (AlSanad, 2018; De Jesus & Mendonça, 2018; Moktadir et al., 2018a), and volatile legal environment in developing countries can hinder SSCM practices (Stewart et al., 2016; Majumdar & Sinha, 2019; Narayanan et al., 2019). The Vietnam Government is responsible for resolving this issue. Nevertheless, ensuring the formulation of policies and regulations that promote sustainability practices through pressure (fines, penalties, legal costs, for example) requires time and careful considerations. Therefore, this challenge appears to be unresolvable for the time being. The Government, though, can promote firms' SSCM implementation with appropriate incentives (tax reductions, infrastructural support, for example). Firms, despite not capable of 'fixing' institutional frameworks, can develop short-term strategic plans that consider social legitimacy, responsibility, and trust to achieve a SSCM-oriented business framework.

According to Chen, Huang & Do (2022) and Do & Huang (2023), the barriers to SSCM adoption in Vietnam also include the lack of a skilled and competent workforce, and the problems with external stakeholders. While the two barriers do not impede SSCM practices as significantly as financial constraints and regulatory challenges, they are amongst the most problematic SSCM challenges (Gonçalves et al., 2024). The lack of knowledge and skills as a barrier to SSCM adoption receives a robust literature support (Keating et al., 2008; González-Torre et al., 2010; Al Zaabi et al., 2013; Govindan et al., 2013 & 2014; Winter & Knemeyer, 2013; Ganjali et al., 2014; Bouzon et al., 2015; Prakash & Barua, 2015; Shaharudin et al., 2015; Touboulic & Walker, 2015; Khan et al., 2016; Stewart et al., 2016; Bhanot et al., 2017; De Jesus & Mendonça, 2018; Neri et al., 2018; Narayanan et al., 2019). There exist several solutions to this problem that Vietnam can employ: (i) fostering an environment conductive to develop human resources with ecological and sustainable skills (the ability to generate ideas for sustainable technologies, and to realize such ideas, for example); (ii) promoting collaboration within and between organization(s) and institutions by exchanging technology, joint training program, … so employees can learn, practice, and accumulate sustainability-related experiences; (iii) customize training programs with experts and/ or foreign assistance on topics related to urgent issues of SSCM implementation; … For problems with external stakeholders, it is difficult to provide proper solutions since this barrier incorporates a diverse set of sub-barriers. Problems with external stakeholders can be the difference between firms' goals and consumers' demand (Carter & Rogers, 2008; Diabat et al., 2014; Khan et al., 2016; Stewart et al., 2016; AlSanad, 2018), or lack of sustainable suppliers (Delmonico et al., 2018; Durdyev et al., 2018; Moktadir et al., 2018a & 2018b), … The general solution would be promoting greater involvement and interaction with consumers and other external stakeholders.

5. Conclusion

In this paper, though we do not offer, or attempt to construct, a definition of SSCM, we investigate the evolution of the concept in literature, since its inception in the 1970s until the 2010s, when research stopped focusing on definition and started showing interest in the relationships between SSCM drivers and barriers, SSCM practices, and performance of firms. Furthermore, we conduct a short review on SSCM drivers and barriers in existing literature, which we use as the foundation to discuss SSCM practices in Vietnam. Evidently, SSCM practices in Vietnam are influenced by a complex interplay of drivers and barriers, with financial constraints, lack of skilled workforce, regulatory challenges, and external stakeholders pose substantial barriers. However, it is not impossible for Vietnam to resolve these issues. By leveraging financial resources, investing in training and education, seeking government support, and engaging with stakeholders, Vietnamese companies can overcome these barriers and successfully implement SSCM. This not only benefits their own operations but also contributes to the broader goal of sustainable development in Vietnam. As Vietnam continues to develop and integrate into the global economy, the importance of SSCM should only increase. In the future, we would like to further contribute to SSCM literature, especially in the context of Vietnam, by continuing to explore this topic, with quantitative works that integrate the existing drivers, barriers, practices, and performance model with social, socio-economic, and political variables tailored to Vietnam, using the data surveyed from Vietnamese companies.

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