

# Sustainable Supply Chain Management Performance

A. Taghipour and C. Beneteau-Piet

**Abstract**—Sustainable supply chain management is more than ever an important subject to deal with. With the increase of environmental concerns as global warming, companies have to integrate this aspect into their management and this for a lot of essential reasons as the following: to keep a good brand image, to reduce operation costs and to agree with lawful measures. In this review we will analyze how the literature has highlighted the concept of sustainable supply chain management (SSCM), and what are the strategies outlined to help companies in their approach to sustainable development concerns. We will notice that three factors are central and need to be considered. These are called by the literature “the triple bottom line approach” and entail the economic, environmental and social factors. A focus will be made on this process in order to measure the performances of a company using SSCM as a method of management.

**Index Terms**—Sustainable, supply chain, suppliers, performance measure, environment.

## I. INTRODUCTION

Nowadays, management of companies’ supply chain has become mainstream. This is mainly because of the increase of outsourcing and partnerships at all stages of the production line. The production chain is more complex than before. Increased global development and competition have pushed many industries to operate on a much more global level. Together with increased outsourcing, the number of companies involved in a typical supply chain has greatly increased.

The SCM allows companies to manage multiple stakeholders linked together (from the same company, or group) but who do not really know themselves because either they are split geographically, neither because they are in different services and therefore in a kind of competition. They do not really communicate with each other and they don’t share any useful information. The SCM enables companies to anticipate the needs and demand by using a collaborative, cooperative and participative process that allows companies to reach operational efficiencies and to create added value.

The supply chain encompasses all activities associated with the flow and transformation of goods from raw materials stage, through to the end user, as well as the associated information flows. SCM is the integration of these activities through improved supply chain relationships to achieve a sustainable competitive advantage. The integration of the entire services all across the supply chain is really important as it can create a centralized supply chain and this leads to

high performance measurements.

However, important concerns have emerged as the sustainable development which is a development that meets the needs of the present generations without compromising the ability of future generations to meet their own needs. This is linked with the conservation of the planet’s resources and the environmentalist wave.

Companies must be aware of that and must integrate these essential issues in their management. That’s why we talk often about “sustainable supply chain management” which is a mean to reduce polluting effect correlated to the production process of any company.

According to the literature, there is a lot of definition possible about the SSCM but the most striking one is belonging to [1]. They define the 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, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements”. This definition specifically includes the cooperation of supply chain partners [2] and the consideration of all three sustainability dimensions.

## II. METHODOLOGY OF RESEARCH

The present article is based on several papers related to SSCM and written between 2007 and 2020. The literature body is changing over time with society evolution. We will start by enhance the major findings of a specific article ([1]) and offer some updates to it by considering the triple bottom line approach which is a group of three elements: economy, environmental and social. These three elements are the key for the companies to perform within a sustainable supply chain management. Then this approach is detailed and illustrated by the example of SSCM in the tourism field.

Concerning our methodology, after selecting our articles, we ordered them by topic (the main scope of each article) and by field of study (for instance: business, economy, or management) to be more precise. We wrote down the important part of each article and we gathered the parts repeated into several articles. We also made researches on books and websites onto our main topic, the sustainable development in order to comprehend in a better way our subject. Then we mixed together the information in order to obtain a base of study.

## III. PRIMARY STRATEGIES

The literature on sustainable development started to increase in the last decade. Mostly between 2005 and 2010. Even if the worries about SSCM were already topical, some researches have been carried out only a few years later. This

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A. Taghipour and C. Beneteau-Piet are with Normandy University, Le Havre, 76600 France (e-mail: atour.taghipour@univ-lehavre.fr, Camille.beneteau-piet@univ-lehavre.fr).

article analyses some of them and enhance the first findings about SSCM and the potential strategies for companies to implement. According [3] “the discussion on SSCM was still in its early stage” during 2007 but there was a sufficient activity and ongoing development in the area of sustainability that was worthwhile for operations management and practitioners to consider the implication and impact of sustainability on traditional supply chain management practices.

In order to implement a new strategy into their production systems, companies have to check the potential barriers and risks before. Indeed, to address the issue of sustainable development, they have to consider all the factors that can affect the net total of their balance sheet.

According to [1], there are external and internal pressures influencing a company who wants to make a sustainable management in order to be “greener”.

External factors can be numerous; we can quote some of them:

- The customers’ demand (as they maybe won’t accept the new final “green” product);
- Legal institutions with their legal demands/regulations that can always progress;
- The competitive advantage of the company, that can be lost if the process fails;
- Loss of reputation related to the brand image;
- Environmental and social pressure groups or lobbies that can exert a strong hold over a company.

Internal factors are more linked to the economic aspect of a company:

- Higher costs;
- Coordination effort and complexity;
- Insufficient or missing communication in the supply chain.

All these concerns are really important for the well-being of a firm and they have to be considered before to start a sustainable management.

Strategies are necessary to overcome the effect of these factors on industries. For instance, we can quote the supplier management for risks and performance which is a strategy that enables companies to control their suppliers through evaluation schemes as explained below.

In fact, when a company is pressured, it usually passes this pressure onto suppliers. Here, one distinctive feature of sustainable supply chain management emerges. Looking at the overall supply chain, the company quite often has to take a longer part of the supply chain into account than needed for “pure” economic reasons. This can lead to risky situations. So, risk management is really important for companies.

As a response to the above-mentioned pressures and incentives, a number of companies have introduced supplier evaluation schemes which integrate environmental and social criteria. This often captures a kind of double aim: the first objective is to avoid related risk, which can be related to all three dimensions of sustainability. Risks can derive from environmental or social performance, but also from disruptions of operational processes as discussed in “conventional” supply chain risk management.

Then another strategy is underlined by [1], called “supply chain management for sustainable product”. A sustainable product is defined in the article as “a term used to comprehend all kinds of products that have or aim at an

improved environmental and social quality”. The ultimate aim is to satisfy customers and gain a competitive advantage in the market. This strategy shows that there need to be an increase in the cooperation between all the members of the supply chain in a concept of “centralized supply chain”. Therefore, the issue is described below with the major findings of the article.

These strategies enabled the authors of the article to underline three main findings. These findings are important for the evolution of SSCM over time. They are listed here with their explanation:

- 1) *Sustainable supply chain management has to consider a wider range of issues and, therefore, look at a longer part of the supply chain:* In fact, supply chain has to be considered from A to B by the management, that is to say, from the producer to the final customer. All members play an important role in the creation of a sustainable management.
- 2) *Sustainable supply chain management deals with a wider set of performance objectives, thereby considering the environmental and social dimension of sustainability:* This issue is the beginning of researches on the topic of the performance measures into the SSCM. Here, the authors of the article depict three main criteria and call them “triple bottom line approach”. They are seen as important point for companies to consider in their management approach. Later in our research paper, we will explain how these dimensions are also vehicle of performance.
- 3) *There is a much-increased need for cooperation among partnering companies in sustainable supply chain management:* This issue talks about the integration of all the members of the supply chain. They have to communicate between each other and this mechanism is key for any business. This finding is more about the idea of a “centralized supply chain” where the information is flowing at every stage. Nowadays, advanced systems are available for companies whose need to accelerate the information flow between suppliers and planning services for instance (in order to avoid inventory costs).

#### IV. FROM RISK TO PERFORMANCE MANAGEMENT

During the 2000s the concept of sustainable development was not so much developed and still stuttering. Therefore, research was more interested in the creation of new strategies able to avoid any risks for companies rather than considering the measurement of sustainability dimensions. In some papers ([1]) dimensions of sustainability are viewed as a potential “risk” for a company but in reality, these three elements can create strong performances and lead to reduce operation costs.

We quoted supplier risk management and supply chain for sustainable products, but there are a lot of other strategies depicted by the literature body in the late 2000. For instance, according to [4] it exists strategies for efficiency, consistency and sufficiency. However, “the information requirements and measures are of course quite different to support efficiency improvement, consistency achievement or sufficiency”. So, we can see here that performance measures are different from strategies.

If we analyze more recent literature, we notice that much

more papers are dealing with performance improvements. Because SSCM has become mainstream, all big companies with important supply chain dispatched all other the world are trying to perform in the field of sustainability in order to keep their competitive advantage. In this chapter, we will concentrate on which type of performance measure is the best to address the findings previously quoted in the second chapter. This will help companies to know what they have to figure out before to consider SSCM.

In the article of [4], three different approaches are possible that could organize and conduct the sustainability-oriented performances:

- 1) A focal company for its supply chain (s);
- 2) All factors in the supply chain, each passing information on to the next tier;
- 3) A third-party organization specialized on sustainability performance measurement of suppliers.

These three key points are important and can measure the SSCM performance easily. Furthermore, we can connect these points to the three findings previously quoted, it can be an answer.

However, according to the article “This shift of the organization perspective has consequences for the assessment on which particular measurement methods are most apt to create reliable sustainability performance information of a supply chain.” If we consider this quote, we can suggest a particular method that can create sustainability performance into a focal company: the triple bottom line approach.

V. SUSTAINABILITY AS A PERFORMANCE MEASUREMENT

In this literature review, we offer particular performance measurements based on the three dimensions of sustainability or “triple bottom line approach”, which are: economic, environmental and social. In sustainable supply chains, environmental and social criteria need to be fulfilled by the members to remain within the supply chain, “while it is expected that competitiveness would be maintained through meeting customer needs and related economic criteria”. Therefore, these three items are highly correlated.

TABLE I: TRIPLE BOTTOM LINE OF SUSTAINABLE SUPPLY CHAIN MANAGEMENT AND SOME EXAMPLES OF CONSIDERATIONS

Triple bottom line			
	Economic	Environmental	Social
Examples	Competitive advantage	Waste management	No forced labor
	Customer demand	Emissions reduction	No child labor
	Reputation	Responsible resource	Fair hours

In the article of [1], they classified the articles used into these three categories and consider these three items as potential risks for SSCM. In our literature review, we highlighted these points into a table. In fact, we can list some of them as Table I.

For the economic perspective; we can say that companies that want to establish a SSCM system have to take into consideration these points because they can decrease if the process fails. For instance, if a “green” product is made, it maybe won’t satisfy customer demand, so the focal company has to work on the product before and make some surveys in

order to check customer attraction for this product.

For the environmental perspective, companies have to respect these points and integrate these into their management. If the transformation is well conducted, the money put into responsible use of water, materials and so on, can translate a reduction in operation costs in the end.

For the social perspective, this is more linked to society concerns that evolved over time. Companies have to respect these points with precaution in order to save their reputation. We can quote the example of the Rana Plaza Disaster which took place in April 2013, because of some violations of the suppliers’ codes of conducts, the building collapsed and killed over 1000 people. This was a famous building located in Bangladesh housing some of the famous suppliers for apparel brands as Primark, Benetton etc. Due to this big issue, apparel brands were forced to work again on their brand image.

So now, let’s demonstrate that these three dimensions of sustainability can act as performance measures. Some technics can be used for each of them. To guide our research, we will focus on these elements by explaining each instrument and defining the terms (we chose two instruments by item) (Table II).

TABLE II: PERFORMANCE MEASURES FOR SUSTAINABILITY

Item	Instrument	Description	Performance measure
Environmental		LCA is about making life cycle thinking and product sustainability operational for businesses that are aiming for continuous improvement. These are businesses that are striving towards reducing their footprints and minimizing their environmental and socio-economic burdens while maximizing economic and social values.	The instrument LCA can perform by extending the product life, the depletion of resources through the production of new product is avoided [5].
	Benchmarking	The benchmarking tool provides you with a framework to measure your environmental performance and allows you to compare your environmental performance and cost against industry peers and covers all environmental aspects.	By comparing environmental performance, the focal company can keep its competitive advantage and decrease operation costs.
Economic	Input-Output Analysis	It is a form of macroeconomic analysis based on the interdependencies between economic sectors or industries. This method is commonly used for estimating the impacts of positive or negative economic shocks and analyzing the ripple effects throughout an economy.	By estimating the impact of the potential economic shocks, the focal company can leverage its management and focus on the core problem: the economics factors (as customer demand for instance)
	Risk Analysis	Risk analysis is the process of identifying and analyzing potential issues that could negatively impact key business initiatives or critical projects in order to help organizations avoid or mitigate those risks.	By identifying the potential external and internal barriers, the focal company can base its SSCM on that in order to succeed.
Social	Benchmarking	A framework to measure social performance (as well as the environmental benchmarking)	Enable the focal company to dialogue with its stakeholders on topics regarding the competitors.
	Corporate citizenship	Corporate citizenship involves the social responsibility of businesses, and the extent to which they meet legal, ethical and economic responsibilities, as established by shareholders.	By integrating corporate citizenship in its management, the focal company will keep a good brand image and reduce its impact on the planet.

These elements, from now on, can be seen as required tools for companies whose want to make their supply chain sustainable. Rather than elaborating strategies to avoid risk, our article enhances this triple bottom line approach that can be much more useful for companies. In fact, it enables them to choose a tool and integrate it into their sustainable supply chain management in order to perform.

It is really important to consider the three key points as they are correlated all together. Furthermore, by implementing the three approaches into their management, companies can make some great performance and even more than other with “traditional” supply chain framework.

The concept is now defined, to continue, we will illustrate our proposal by an example: the successful use of SSCM in the tourism field.

### VI. SUSTAINABLE SUPPLY CHAIN INTO THE TOURISM FIELD

Yet SSCM is particularly important for tour operators, as the product depends on the activities of suppliers, such as accommodation, transport and activities. Therefore, tour operators’ contribution to sustainable tourism will be more effective through the definition and implementation of policies that acknowledge responsibility for the impacts of suppliers ([6]).

TABLE III: SUSTAINABLE SUPPLY CHAIN MANAGEMENT IN THE SECTOR OF TOURISM

Area	Economic	Environmental	Social
Accommodation	Auditing and management in hotels.	Smaller accommodations to take less action on environmental issues. Use of solar wind and energy. Reduction of costs from energy, water and waste.	Local food and local hosts. Running training program for employee on topic as hygiene and hospitality.
Transport	Ask the contribution of customers to sustainable schemes.	Carbon offset schemes. Calculate carbon dioxide emissions.	Taking tours to remote regions where limited transport is available. Economic considerations for local partners.
Excursions, activities	Financial investments to assist ground handlers to improve the quality of services.	Disposal of litter and protection of fragile sites. Giving customer information on issues affecting the local environment.	Selecting suppliers based on community and workforce issue. Promoting visits to community projects or local tourism companies.
Food and crafts	Technical and investment in order to gather supplies from different producers that meet the quality and quantity required.	Importation of local seafood, meat (fresh products). Support conservation goals.	Work with local suppliers to promote local sourcing. Maintain traditional arts and crafts.

Tourism is in fact an important reason of polluting effect in a lot of countries. That is the reason why tour operators

started working on SSCM early. They have an impact on different sectors as: accommodation, transport, excursions and activities or even food and crafts.

We will identify in a table which tools (between our three dimensions: economic, environmental and social) tour operators used the most to perform in SSCM (Table III).

We clearly see thanks to this table that sustainable supply chain management into the tourism field is a success for tour operators. Even if there are still priorities areas to work on to increase performance, there is already advancement. Our three dimensions are useful tools to evaluate the company improvements. Here the three items are fulfilled so the SSCM is optimally conducted.

### VII. CONCLUSION

As sustainable development concerns are essential today for the preservation of our resources and our future, the research on this topic is also important. For this reason, this article offers a kind of review of the passed literature but offers also a new instrument that can estimate the performance of a company into a sustainable system of management. In fact, formerly, the literature body was more attached to comprehend the sustainable approach, and was proposing some strategies for companies in order to help them in their supply chain transformation process. However, today, times have changed and companies are seeking for performance and for the optimization of their production line, the reduction of all the costs is also primordial. That’s why, useful tools are proposed by the literature corpus, and this paper don’t make the exception to the rule, it also provides a three-part work for performance measurements thanks to an old consideration “the triple bottom line approach”.

### CONFLICT OF INTEREST

The authors declare no conflict of interest.

### AUTHOR CONTRIBUTIONS

In this paper, Camille Beneteau-Piet conducted the research. Atour Taghipour supervised the research. All authors had approved the final version.

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**Atour Taghipour** is a professor and the head of two international management master programs at Normandy University in France. He holds an HDR in management from Normandy University and a Ph.D in industrial engineering from the Polytechnic School of Montreal in Canada. He received two masters' degrees, one in management, logistics & strategy and other in industrial engineering. He has more than ten years of experiences as a manager in automobile

industries. He has published different books and many research papers in international journals. His areas of research are supply chain and operations management.

**Camille Beneteau-Piet** was a second year master's degree student in management and international trade and international purchasing at University of Le Havre Normandy. She has also studied master of international marketing. She is an active profesional in supply chain and purchasing management.