

# Best Practices in Sustainable Supply Chain Management: A Literature Review

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**Abstract** On the basis of a content analysis, this paper explores the evolution of best practices from the traditional approach to cost efficiency in supply chain management towards the current context of sustainability. In this sense, the paper shows a comprehensive review of the best practices that supply managers will need to engage in to create a sustainable supply chain. Our analysis suggests that the practices that lead to a more sustainable supply chain management are in equal parts best practices in traditional supply chain management or slight modifications of existing practices, and innovative practices.

**Keywords** Best practices · Literature review · Logistics · Sustainable supply chain management (SSCM)

## 1 Introduction

As the new economic order unfolded, people recognized that profits and profitability were only one element in the long-term success of companies and economies. Other important factors are the future of people and the future of planet Earth [7]. These legitimate new concerns are captured in measures as the triple bottom line. According to Carter and Rogers [3], the triple bottom line suggests that at the intersection of social, environmental and economic performance, there are activities that organizations can engage in which not only positively affect the natural environment and society, but which also result in long-term economic benefits and competitive advantage for the firm.

These new trends of thinking underwent a great development in recent times. It was in the first decade of 2000 when concepts of Corporate Social Responsibility

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(CSR), Green or Sustainability and Supply Chain Management (SCM) began to be jointly dealt with in literature. In this paper, the terms sustainability (or “green”) are used as synonyms for corporate social responsibility [13]. According to Seuring and Müller [11], we define sustainable supply chain management (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 (economic, environmental and social) into account which are derived from customer and stakeholder requirements”.

However, although the literature of SSCM has been evolving rapidly, most of the companies are still searching for the best way to implement sustainability principles into their supply chain. Likewise, Andersen and Skjoett-Larsen [1] point out that despite many multinational corporations’ efforts to implement social and environmental issues in their supply chains, a gap exists between the theoretical application of sustainability in SCM in theory and the implementation in practice.

For other authors [5], the literature on SSCM is still limited, and focuses on the study of the concrete fields (for example, there is very limited research that explores the social dimension of sustainability), and it is scant in literature reviews.

In this context, and taking into account that the question for companies has become not whether to commit to a strong environmental, health and safety record, but how to do so in the most cost-effective manner [7], the aim of this paper is to explore the evolution of best practices from the traditional approach to efficiency in the SCM to the current context of sustainability. This paper conducts a comprehensive literature review from a holistic perspective, integrating the triple bottom line with all the logistics activities along the SC: purchasing, production, warehouse and transportation, and reverse logistics.

## 2 Methodology

A literature review is a systematic, explicit, and reproducible design for identifying, evaluating, and interpreting the existing body of recorded documents [4]. Literature reviews usually have two objectives: first, they summarize existing research by identifying patterns, themes and issues; second, they may constitute an initial step in the theory development process [8].

From a methodological point of view, literature reviews can be comprehended as content analysis. Content analysis is a method for the objective, systematic, quantitative and reliable study of published information, i.e. a suitable method for comprehensive literature reviews [9]. A process model for a content analysis is described in four steps [11]:

1. Material collection: the material to be collected is defined and delimited.
2. Descriptive analysis: formal aspects of the material are assessed.
3. Category selection: structural dimensions and related analytic categories are selected, which are to be applied to the collected material.

4. Material evaluation: the material is analyzed according to the structural dimensions. This should allow identification of relevant issues and interpretation of results.

According to Spens and Kovács [12], content analysis can be used as an instrument for determining key ideas and themes in publications but also, such as in our case, for measuring comparative positions and trends in reporting.

## 2.1 *Sample and Delimitations of the Research*

The first step in content analysis is to determine the documents to be analyzed and the units of analysis. As this literature review aims to study the evolution of best practices in logistics activities that lead to a more SSCM, we selected logistics-related journals for the sample. The logistics journals selected are perceived as of the highest quality and represent the state of the art of logistics research (in alphabetical order): *European Journal of Purchasing & Logistics Management*, *Harvard Business Review*, *International Journal of Integrated Supply Management*, *International Journal of Logistics Management*, *International Journal of Operations & Production Management*, *International Journal of Physical Distribution & Logistics Management*, *International Journal of Production Economics*, *International Journal of Production Research*, *Journal of Business Logistics*, *Journal of Cleaner Production*, *Journal of Operations Management*, *Production and Operations Management*, *Purchasing and Supply Management*, *Supply Chain Management: an International Journal*, *Transportation & Distribution* and other journals.

The time period of the literature review was defined between 1990 and 2011. After a first quick content check, identified articles were included or excluded from the analysis. This first phase involved using the preliminary keyword “best practices” to guide the research by identifying the papers that explicitly included that keyword in this title, abstract and/or full text. The papers that did not meet the practical approach in conducting the literature review were excluded (i.e., mathematical models of SSCM, theoretical approaches related to different organizational theories, technical issues—minimizing CO<sub>2</sub> emissions, ...—or case studies focused in specific fields—energy, oil and gas industry...).

Taken the stated delimitations into account, a total of 105 papers were identified. The list of revised papers is available on request.

## 2.2 *Categorization in the Coding Scheme*

Content analysis builds on a coding scheme that is developed on the basis of a theoretical framework. In order to derive patterns in the presentation and reporting of information, content analysis involves the codifying of information into pre-defined categories [6].

The second phase of the research involved the application of the keywords listed below and different combination of them:

- Cost (reduction)
- Efficiency
- Environment (al)
- Green
- Lean (operations, manufacturing)
- Logistics (management, network)
- Manufacturing
- Operations management
- Performance
- Production (management)
- Purchasing (management)
- Reverse logistics (or supply chain)
- Social responsibility
- Supplier
- Sustainability (or sustainable)
- Supply chain management
- Transportation
- Vendor
- Warehouse (management)

### **3 Frequency Analysis**

As we stated before, 105 papers were identified in the literature review in the research period (1990–2011). While 1991 is the first year where papers about traditional best practices (economic efficiency approach) in Logistics/SCM were found, the greatest number of publications on these practices is found in the time period between 1995 and 2001. Instead, the greatest number of publications on sustainable best practices is found from 2006 onwards. The distribution of the papers in the research period is shown in Figs. 1 and 2.

### **4 Best Practices: from Cost Efficiency to Sustainability**

As a result of the content analysis, the best practices identified were classified into two broad categories: traditional (economic efficiency point of view) and sustainable. Then, for each category, the practices were sorted in four subcategories based on their application: throughout the supply chain, in purchasing management, in production management, in warehouse and transportation (W&T) management and in reverse logistics management.

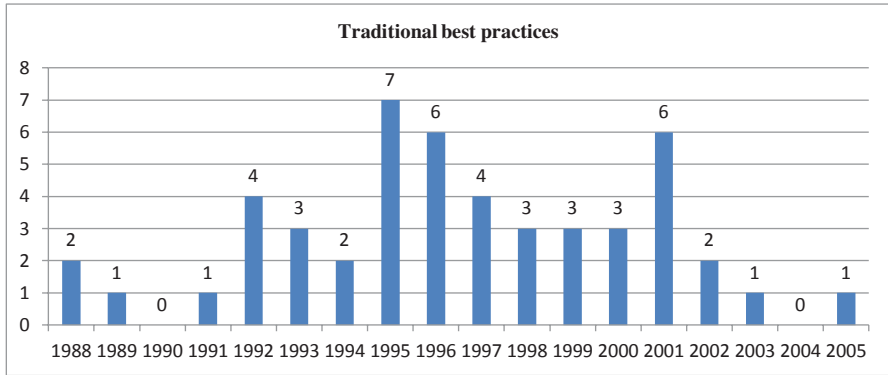


Fig. 1 Distribution of papers related to traditional best practices across the research period (Note: three relevant papers were founded in 1988 and 1989 were added to the research period)

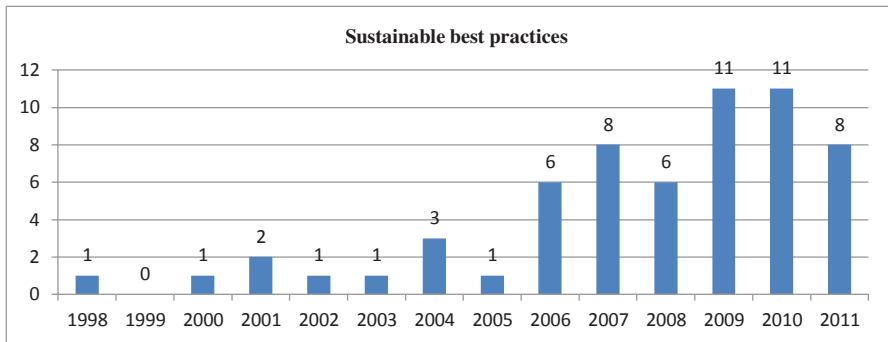


Fig. 2 Distribution of papers related to sustainable best practices across the research period

We show a synthesis of our findings due to reduction reasons. First, we list the traditional and sustainable best practices with general application throughout the entire supply chain. Then, we show in Table 1 the evolution of the best practices for each logistics area, identifying: traditional practices without and with continuity in the context of sustainability (TP-Discontinuity, TP-Continuity), sustainable practices which are modifications of existing practices (SP-Modification) and innovative sustainable practices (SP-Innovation).

This is the list of traditional and sustainable best practices with general application:

- Traditional practices:
  - Quality and environmental management systems implementation (under the international standards ISO 9000, ISO 14000 and Eco-Management and Audit Scheme of the European Union).
  - Coordination between buying and supplying organizations.
  - ICT implementation.

**Table 1** Best practices: from efficiency to sustainability

TP-discontinuity	TP-continuity	SP-modification	SP-innovation
<i>Purchasing</i>			
Supplier requirements to reduce cost annually	Supplier selection	Long-term relationships with suppliers	Local suppliers development
Supplier requirements of warehouses	Supplier certification	Codes of conduct	Reward systems linked to sustainability
	Collaborating with suppliers Supplier development	Traceability and collaboration with suppliers Ensuring supplier continuity	Transparency and ethics in purchasing Reducing supplier risk
<i>Production</i>			
Relocation of facilities (low labor cost)	Just in time operations	Sustainable products and process design	Environmental conscious design (ECD) and Life-cycle analysis (LCA)
Layout optimization	Outsourcing Waste management Lean production	Postponement Green manufacturing and remanufacturing Lean-Green synergies	Closed-loop SC Source-reduction and Pollution prevention Lean-Green operations
<i>W&amp;T</i>			
Reduction of the number of warehouses	Inventory reduction	Inventory reduction and proper storage of hazardous materials	Donation of excess or obsolete inventory
Full truck deliveries	Cross-docking	Recyclable and reusable packaging and containers	Reverse logistics, minimizing traffic and reducing noise pollution
	Intermodal transportation Efficient delivery (standardization in packaging and delivery units, ...)	Clean transportation/fuel efficiency Extending JIT/lean approach to warehouse and transportation	Reward systems linked to sustainability Economic + environmental + safety as a selection criteria of for-hire carriers
<i>Reverse logistics</i>			
Efficient management of returns	Just in time in reverse logistics	Redesigning logistics networks to accommodate returns	Closed-loop supply chains
	Systems of selected collection of materials	ICT as support of RL value measurement	To integrate the financial impact of RL strategies

- Sustainable practices:
  - Reporting on different standards (focused on codes of conduct, product/process-related or management systems and initiatives).
  - Collaborative behaviors with suppliers and customers.

- Collaborating with nontraditional chain members (NGOs, Competitors, Trade groups,...).
- Designing and managing processes to achieve transparency and traceability.
- Addressing the governance structure for SSCM.
- Benchmarking in sustainability.

In Figs. 1 and 2 the frequencies of the two broad categories' occurrence are displayed.

Table 1 shows the evolution of the best practices for each logistics area.

## 5 Discussion and Conclusions

The confluence of the core-competency and process management movements caused many of the changes in the 1990s. As companies developed their core competencies and included them in their business processes, the tools and concepts of TQM and JIT, and afterward Lean approach, were applied to developing new products and managing the supply chain [7]. But, the literature review of the best practices for effective SCM shows that inter-firm competitive advantage has been mainly focused in profit criteria.

Over the past two decades, increasing pressures from governments, customers and other stakeholders groups have prompted firms to incorporate sustainability issues into their SCM schemes. However, these external pressures on a firm only lead to sustainable supply and production if both the individual firms and the supply chain as a total entity develop the necessary relevant internal resources as prerequisites for implementing SSCM [2]. In this context, most of the companies are still searching for the best way to implement sustainability principles into their supply chain. Our analysis shows that the practices that lead to a more SSCM are equal parts best practices in traditional SCM or slight modifications of existing practices, and innovative practices. However, to gain positive results, the firm must establish management systems and tools that integrate environmental, health and safety metrics with other process metrics within the company and across the SC. In this sense, Rothenberg et al. [10] examined the links between lean and green and found some synergies but also found that harvesting them is not simple. SCM researchers and practitioners are just beginning to face new challenges in integrating sustainability in their areas of interest.

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