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Efficiency and sustainability through the best practices in the Logistics Social Responsibility framework

Ana M. Mejías
Department of Business Organization, University of Vigo, Vigo, Spain
Enrique Paz
Department of System Engineering and Automation, University of Vigo, Vigo, Spain, and
Juan E. Pardo
Department of Business Organization, University of Vigo, Vigo, Spain

Abstract

Purpose – The purpose of this paper is to analyze the best way to implement sustainable practices in the Logistics Social Responsibility field. Using the best practices (BPs) approach, the authors have answered the question about how logistics function can take on board the principles of sustainability.
Design/methodology/approach – A systematic literature review has been applied, with an analysis of 194 papers from relevant logistics/supply chain management (SCM)-related journals over a 20-year time frame.
Findings – The authors have identified a first set of traditional BPs that are still relevant in the sustainability context, a second set of innovative sustainable BPs and a third set that can be considered sustainable BPs evolved from the traditional cost-efficiency approach, serving as a link between the other ones. This proposed taxonomy of BPs charts a progressive path toward integration of sustainable principles in SC-logistics operations.
Research limitations/implications – The methodological approaches applied entail inherent limitations. However, the authors have set out to ensure rigor by following a structured process approach.
Originality/value – The work contributes by filling two recurring gaps identified in the literature: the need to integrate social and environmental issues and develop more practical tools for implementing sustainable SCM. The progressive way of implementing sustainable BPs has advantages for logistics managers, especially when companies have limited resources for transforming their logistics process into a sustainable process. Additionally, future academic research topics are proposed.

Keywords Content analysis, Sustainable supply chain management, Systematic literature review, Best practices, Logistics Social Responsibility
Paper type Literature review

Nomenclature

BPs	best practices	SCM	supply chain management
CSR	corporate social responsibility	SSCM	sustainable supply chain management
GrSCM	green supply chain management		
ICT	information and communication technologies	SLR	systematic literature review
		TBL	triple bottom line
LSR	Logistics Social Responsibility	TBSs	traditional best practices
SBPs	sustainable best practices	WCM	world class manufacturing
SC	supply chain		

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1. Introduction

During the 1990s, the link between corporate social responsibility (CSR) and sustainability was established. Then, in the first decade of this century, the concepts of CSR/sustainability and supply chain management (SCM) were first dealt with as a joint issue in the literature. But, while the literature on the theory and the practice of sustainable SCM (SSCM) is growing, many authors agree on the shortage of research in many areas. According to Pagell and Wu (2009), there are fundamental issues researches need to address in order to offer managers models to develop sustainable SC.

First, the literature has mostly considered the environmental dimension of sustainability without explicit incorporations of the social dimension (Porter and Van der Linde, 1995; Shrivastava, 1995; Sharkis, 2001; Gimenez and Tachizawa, 2012). Green supply chain management (GrSCM) is increasingly described by operations and SC management researchers and practitioners (King and Lenox, 2001; Murphy and Poist, 2003; Vachon, 2007; Darnall *et al.*, 2008; Hsu *et al.*, 2013; Lo, 2014). Indeed, considerable interest is noted in the research literature regarding the relationships between environmental management activities and performance results (Florida, 1996; Klassen and Whybark, 1999b; Goldsby *et al.*, 2000; Montabon *et al.*, 2007; Dam and Petkova, 2014).

However, the sustainability concept is supported integrating environmental, social and economic performance (triple bottom line (TBL)). Therefore, research needs to grow toward the integration of these three dimensions. As Carter and Rogers (2008, pp. 364-365) suggest:

> […] 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.

Second, empirical research has tended to analyze single activities of the SC, paying less attention to the entire SC. As examples, we could mention: transparency and ethics in purchasing (Awaysheh and Klassen, 2010), environmental purchasing (González-Benito, 2010), cleaner production (Zeng *et al.*, 2010), sustainable transportation (Feitelson, 2002) or waste management (Daian and Ozarska, 2009). But, equally as interesting as these partial approaches, Logistics Social Responsibility (LSR; Carter and Jennings, 2002) emerges as a way to integrate the study of sustainability throughout the SC process. Research into LSR is relatively recent and still limited (Carter and Jennings, 2002, 2004; Murphy and Poist, 2003), and so it seems clear that SSCM research cannot be complete without filling the gap where LSR should be in the literature.

Last, there are limitations on researching into the best ways of integrating and implementing sustainable principles in SCM practices (Morali and Searcy, 2013). Sustainable principles are considered in the broad sense of the guidelines framed in the definition of sustainable development given by the World Commission on Environment and Development (1987), that suggests that companies not only focus on economic aspects, but also on the need to sustain natural resources and society. Likewise, mention can be made of the ten universal principles of the United Nations Global Compact related to human rights, labor, environment and anti-corruption.

If we consider best practices (BPs) to be those that lead to performance improvement (Davies and Kochlar, 2002), it is clear that sustainable BPs (SBPs) should play a key role in SSCM performance. The term "World Class Manufacturing" (WCM) was introduced and defined by Hayes and Wheelwright (1984) as a set of BPs such as quality management, continuous improvement and training and investment in technology.

On this basis, several questions could be asked: are these or other similar classical or traditional BPs, sustainable practices? Could any traditional and successful BPs be considered inappropriate in the sustainable context? Is there a consensus about a set of SBPs? The answers to these questions are not obvious.

First and foremost, in terms of the environmental dimension, it is now apparent that BPs require integrating environmental factors into operations management (Shrivastava, 2007) so that, in a proactive sustainable approach, companies have been integrating activities such as "green" purchasing and the well-known ISO 14001 implementation into their strategies (Kitazawa and Sarkis, 2000; Chen, 2005). However, we found the opposite situation in JIT, BP integrated in lean manufacturing strategy and the requirement of small lot sizes, involving more logistics operations and, therefore, hindering the green approach (Mollenkopf *et al.*, 2010).

Deepening the dilemma, Pagell and Wu (2009) analyzed the recent literature and discovered that most sustainable practices identified by research are modifications of existing BPs related to environmental outcomes (and generally ignoring the social component of sustainability). The authors concluded that, while all of this research must be recognized, no coherent set of practices in SSCM has emerged. Indeed, they posit that much of the existing literature is built on linking existing BPs in traditional SCM to sustainability; the question is how to find out what leaders in SSCM companies are doing that it is different from the traditional approach.

Thus, the aforementioned research identifies gaps and questions that this paper sets out to deal with from a holistic perspective by integrating the three dimensions of sustainability in the LSR field. In this framework, and through a literature review, our research attempts to answer some research questions that have so far been either partially or completely left unanswered:

RQ1. Which traditional BPs are relevant in the sustainable context and which could even be hindrances?

RQ2. Which BPs are really new or innovative in SSCM?

RQ3. Is it possible to design a progressive path by linking traditional and innovative BPs together to integrate the sustainable concepts into the SCM?

RQ4. What is the best way to incorporate the BPs approach into SCM and logistics processes to achieve improved economic, social and environmental performance?

The third and the fourth questions have to do with the trend shown in the sustainability/corporate responsibility literature for linking existing BPs in traditional SCM to sustainability. We agree with the authors who demand significant changes and innovation, i.e., "to do new things, or the same things in a different way, in the sustainable approach." Nevertheless, we advocate that the sustainable path could be progressive, and that committed and proactive companies should take advantage of the achievements already attained in sustainability when implementing a traditional economic efficiency approach to BPs in SCM. With a view to answering the proposed questions, this paper has the following structure. First, we provide a review of research literature in summary form. Then, we describe the applied methodology. Next, we describe our findings on BPs identified as being of interest by developing a literature review of SCM and the logistics cross-functional area and the links between the traditional and the innovative views over a 20-year time frame. In the last section, we draw some conclusions and identify future directions for this research.

2. Literature reviews in sustainable SCM

Literature reviews on SSCM were introduced for the first time during the last ten years and developed with different approaches (Gold *et al.*, 2010). The first papers mostly introduced theoretical frameworks (Svensson, 2007; Seuring and Müller, 2007, 2008; Carter and Rogers, 2008; Mollenkopf *et al.*, 2010; Gold *et al.*, 2010; Sarkis *et al.*, 2011) and a few dealt with SSCM implementation.

This latter approach is mainly focussed on the environmental dimension of sustainability (Zsidisin and Siferd, 2001; Abukhader and Jönson, 2004; Srivastava, 2007), so it is worth mentioning a paper with a social approach, Cantor (2008), in which the author calls for further research into the human, operational and regulatory issues that help increase safety in the SC in the workplace.

Even so, we can only highlight a scant number of literature review papers on SSCM implementation with a holistic point of view from the last decade. Two examples are the paper developed by Kleindorfer *et al.* (2005) with a literature review of the papers in the first 50 issues of the *Production and Operations Management Journal*, analyzing the integration of sustainability into operations management, and the research by Ciliberti *et al.* (2008) in the LSR field. Based on this approach, complemented by a broad literature review in sustainability applied to specific logistics processes and an empirical analysis, the authors show a taxonomy of LSR practices classified into five areas: purchasing social responsibility, sustainable transportation, sustainable packaging, sustainable warehouse and reverse logistics.

Recently, literature review papers in the SCM field have increased their concern about supporting their findings with a systematic literature review (SLR) methodology in order to maximize validity and reliability. Regarding the SCM sustainability context, 11 papers have been collected: Carter and Easton (2011), Dey *et al.* (2011), Abbasi and Nilsson (2012), Miemczyk *et al.* (2012), Gimenez and Tachizawa (2012), Ashby *et al.* (2012), Morali and Searcy (2012), Taticchi *et al.* (2013), Martínez-Jurado and Moyano-Fuentes (2014), Winter and Knemeyer (2013) and Zorzini *et al.* (2015).

All of these papers have the common purpose of exploring the body of knowledge already developed and seeking out future directions or opportunities for research. Several proposals for future research are reiterated: exploring approaches to integrate the TBL objectives of sustainability into SCM; filling the gap between the diffusion of sustainability discourse and its practical applications; and developing appropriate metrics in support of SSCM. Furthermore, logistics operations hold significant potential for sustainability because of the combination of monetary cost and the environmental impact. Issues such as green operations, reverse logistics and closed-loop SC are critical for applying a more connected and holistic view of SC; people's mindset and the role of SC relationships are also key topics in achieving sustainability.

Following the main lines plotted by this set of papers, we have conducted a new SLR aimed at delving deeper into SC-logistics operations and defining how to put the sustainable principles into practice. Our review has been developed under the BPs approach, which has been focussed in the issues and areas identified as key for SSCM in the preceding literature reviews.

3. Methodology research

The above section sets out a descriptive literature review (a state of the art synthesis) which formulates the basis for our research. During the first research phase, we developed a SLR and proceeded to focus on the answers to the research questions by combining the content analysis methodology.

Compared to the descriptive reviews, the SLR differs by being, as its name implies, more systematic and by employing rigorous and reproducible methods of evaluation (Denyer and Tranfield, 2009). In the second research phase, the content analysis technique was applied in order to make valid and replicable inferences from the analyzed texts (Krippendorff, 2004). Coding is a key factor for this technique and involves selecting analytical categories in order to classify the information into them (Guthrie *et al.*, 2004).

Finally, our aim was to apply a qualitative approach, seeking to explore underlying themes in the papers analyzed (Abbasi and Nilsson, 2012) and not to follow a quantitative approach, quantifying content in terms of the predefined categories (Bryman and Bell, 2007).

3.1 Material collection and first coding

To compile the sample, SLRs are carried out by keyword searches conducted in major academic databases (Science Direct, EBSCO, Emerald Fulltext, etc.) or in a selected number of journals.

As this SLR aims to analyze the evolution of BPs in logistics activities, which contribute to improving SCM sustainability, logistics/SCM journals have been selected for our study. We defined 1990-2010 as the selected time period for two reasons. The first, because most research examining CSR/sustainability from a partial perspective was published in the 1990s, and the second because research examining CSR/sustainability from a more holistic perspective has been published in the last decade (Carter and Easton, 2011).

To limit the papers to a manageable number, the selected journals were those that were perceived to be of the highest quality and representative of the state of the art of logistics/SCM research (Carter and Easton, 2011; Hazen *et al.*, 2012; Winter and Knemeyer, 2013). Moreover, through some references cited in articles from the above list, several papers found in other journals of an interdisciplinary nature were selected. The selected journals are shown in Table I.

Taking into account the definition of BPs proposed by Laugen *et al.* (2005, p. 131):

> […] the practices used by, and having significant effect on the performance of, the best performing companies.

The first stage of the SLR identified relevant papers to be included in the analysis by using the keyword "best practices" to identify the papers that explicitly included this preliminary keyword in all fields (title, abstract and full text). Then, we considered a second combination of keywords, "activities" OR "practices" AND "performance," to take into account the papers in which the expression "best" was not explicitly written but implicit by its definition.

The search for the second keywords was limited to the abstract field in order to match the content of the papers to the subject of our research. This approach involved explicitly excluding papers that did not indicate at least one BP. Finally, 194 papers were identified. Table I shows the distribution of papers by journal.

The second stage used the keywords "ecology*," "green," "(corporate) social responsibility" and "sustainab*" (see Miemczyk, *et al.*, 2012; Gimenez and Tachizawa, 2012) to separate the identified papers into two categories. One was related to the sustainable approach – SBPs papers – (these keywords were explicitly included) and the other to the traditional approach of BPs – TBPs papers – (these keywords were not explicitly included). Keywords which started with "environment*" were also used, but in combination with the other three keywords. This was performed to differentiate papers related to the sustainable context (two or more combinations of keywords were found)

Journals	No. of papers
European Journal of Purchasing & Supply Management	3
European Journal of Operations Research	2
International Journal of Logistics Management	4
International Journal of Operations & Production Management	25
International Journal of Physical Distribution & Logistics Management	16
International Journal of Production Economics	7
International Journal of Production Research	11
International Journal of Productivity and Performance Management	2
Journal of Business Logistics	8
Journal of Cleaner Production	11
Journal of Operations Management	15
Journal of Purchasing and Supply Management	1
Journal of Supply Chain Management	3
Production and Operations Management	5
Production & Inventory Management Journal	1
Supply Chain Management: An International Journal	9
Transportation Research: Part E	1
Transportation Science	1
Academy of Management Journal	3
California Management Review	4
Decision Sciences	5
Harvard Business Review	7
Sloan Management Review	4
Strategic Management Journal	5
Others	41

Table I. Distribution of papers by journal

from papers related to the traditional environmental management systems approach (i.e. under international standards such as ISO 14000 and EMAS).

Third, the two groups of papers were separated into four new broad categories based on the applied generic or specific logistics process. This was done throughout the entire SC; in purchasing, manufacturing and in warehouse and transportation (W&T). The reverse logistics process was not an included category because we consider this process to be linked by definition to the sustainable approach, which is in clear contrast with the traditional approach.

In order to enhance research reliability, the structured keyword search was conducted by one researcher and then checked by another, given that the use of multiple researchers helps to control bias due to one individual researcher (Duriau *et al.*, 2007). When two researchers did not agree, a third intervened in order to reach an agreement.

3.2 Content analysis and second coding

The SLR was complemented by an additional qualitative analysis for the purpose of codifying the BPs described in the papers (Seuring and Gold, 2012).

Using this approach and bearing in mind the proposed research questions, the data analysis was divided into three parts (see Figure 1):

(1) Two BPs lists that were applied across the entire SC were developed; one of the lists contained BPs related to the traditional approach of economic efficiency (see Table II) and the other one contained BPs related to the sustainable approach (see Table III).

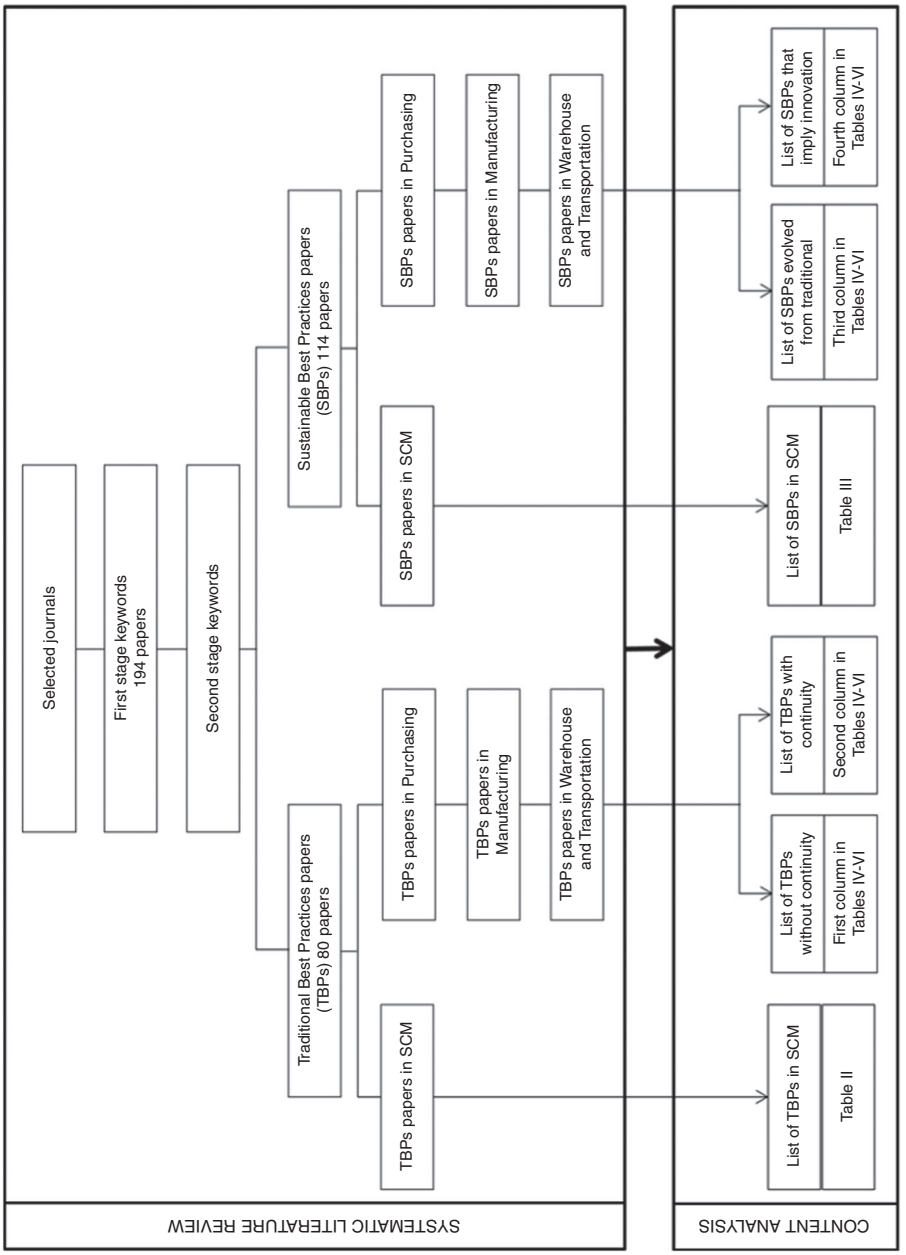

Figure 1.
Synthesis of methodology research

Traditional best practices in the SCM										
Quality and environmental management systems implementation (under the international standards ISO 9000, ISO 14000 and Eco-Management and Audit)	Sako (1992)		Porter and Van der Linde (1995), Shrivastava (1995)		Green *et al.* (1998)	Christmann (2000)	Tan (2001)			Robinson and Malhotra (2005)
Coordination between buying and supplying organizations	Turnbull *et al.* (1992)			Dyer (1997), Mclvor and Mcaleer (1997)			Prater *et al.* (2001)	O'Toole and Donalson (2002)	Chopra and Sodhi (2004)	Power (2005)
ICT implementation		Henderson and Venkatraman (1993), Brynjolfsson (1993)				James and Wolf (2000)				

Table II. Traditional BPs in the SCM

Table III.
Sustainable BPs in the SCM

Sustainable best practices in the SCM											
Greening the supply chain	Walton *et al.* (1998)	Hall (2000)	Zsidisin and Siferd (2001)		Sarkis (2003)	Hansen *et al.* (2004)	Vachon and Klassen (2006)	Srivastava (2007), Montabon *et al.* (2007)	Darnall *et al.* (2008)		Senge (2010)
Reporting on different standards (focussed on codes of conduct, GRI, management systems and initiatives)						Gunaserkan *et al.* (2004)		Gunaserkan and Kobu (2007)	Darnall *et al.* (2008), Ciliberti *et al.* (2008)	Andersen and Skjøtt-Larsen (2009)	
Collaborative behaviors with suppliers and customers								Klein and Straub (2007), Sandberg (2007)		Zacharia *et al.* (2009)	Kim and Lee (2010)
Collaborating with non-traditional chain members (NGOs, competitors, trade groups, etc.)							Porter and Kramer (2006), Olonruntoba and Gray (2006)			Peloza and Falkenberg (2009)	Senge (2010)
Designing and managing processes to achieve transparency and traceability						Schrage (2004)				Visich *et al.* (2009)	New (2010)
Addressing the governance structure for SSCM		Cannon *et al.* (2000)	Griffiths and Petrick (2001)	Poppo and Zenger (2002)							Mahapatra *et al.* (2010)
Benchmarking in sustainability				Phylipsen *et al.* (2002)				Ketchen y Hult (2007)		Li and Dai (2009)	Adebanjo *et al.* (2010)

(2) The BPs identified in the papers classified as TBPs belonging to each logistics process analyzed were listed and codified in two categories: TBPs without continuity (not relevant or not appropriate) in the sustainable context (the last references predate the 2000s, always refer to the first column in Tables IV-VI) and TBPs with continuity in the sustainable context (references were found from both analyzed decades, always refer to the second column in Tables IV-VI).

(3) The BPs described in the papers classified as SBPs belonging to each logistics process analyzed were also listed and codified in two categories: innovative SBPs (only cited in the SBPs papers and without trace in TBPs papers, always refer to the fourth column in Tables IV-VI) and SBPs evolved from the traditional context (those that partly share a common description a TBP and show progress toward SBP, always refer to the third column in Tables IV-VI).

Similar to the SLR, the data analysis process also included multiple researchers. First, all BPs from the papers were collected in order to minimize the potential for bias in the qualitative analysis. Each of the researchers dealt with one of the first three parts of the qualitative analysis while also checking the results of another part. This was so that two researchers would handle every part and so each researcher would handle two different parts. This process was also similar to the SLR in that disagreement between two researchers led to the third becoming involved in order to reach an agreement.

The qualitative content analysis was concluded by grouping the lists of identified and codified BPs into a few bundles of "generic" BPs in order to facilitate the answer to *RQ4* (as e.g. the BP "green manufacturing and remanufacturing" – third column in Table V – includes BPs cited in papers such as: recycling, material recovery, remanufacturing). This was conducted by allowing the possible links between these generic BPs to be outlined in a progressive evolution with a manageable amount of items. This final part of the analysis was developed individually by each researcher and then the schemes were compared to jointly develop a final version by consensus.

We have tried to ensure a rigorous research process by following a structured approach that provides objectivity, validity and reliability (Spens and Kovács, 2006). Being systematic means applying rules in order to avoid bias (Abbasi and Nilsson, 2012). Additionally, we have also tried to list exhaustive and mutually exclusive categories.

4. Findings

As the results from the content analysis describe above, the identified "generic" BPs are described across five tables. Tables II and III list traditional and sustainable BPs suitable for through the entire SC (in all activities). Tables IV (purchasing), V (manufacturing) and VI (W&T) show the traditional BPs that are irrelevant or hindrances in the sustainable context (always in the first column of tables) and then follows them by rows of BPs, each row showing the traditional approach (second column position), the evolution toward the sustainability (third column position) and the innovative view (fourth column position) for each linked field of improvement (row of BPs).

About the findings described in Table II, the content analysis highlights coordination between buying and supplying organizations, quality and environmental management systems and ICT implementation as the three main BPs accepted in the SCM from the traditional point of view. The latest references correspond to 2005 but

Table IV.
Traditional and sustainable BPs in the purchasing area

Traditional practices without continuity		Traditional practices with continuity		Sustainable practices-evolution		Sustainable practices-innovation	
Supplier requirements to reduce cost annually	Linker *et al.* (1996), Dyer (1997)						
Supplier requirements of warehouses, stocks, etc.	Cusumano and Takeishi (1991), Sfuckey and White (1993), Millington *et al.* (1998)						
		Supplier selection	Oliver *et al.* (1996), Dyer *et al.* (1998), Halldorsson *et al.* (2007), Pressey *et al.* (2009)	Long-term relationships with suppliers	Carter and Jennings (2000), Andersen and Skjøtt-Larsen (2009), Kim and Lee (2010)	Local suppliers development	Carter *et al.* (1999), Porter and Kramer (2006), Ciliberti *et al.* (2008), Hall and Matos (2010)
		Supplier certification	Green *et al.* (1998), Carter and Carter (1998), Tan (2001), Pagell and Wu (2009)	Environmental purchasing and codes of conduct	Drumwright (1994), Carter and Carter (1998), Carter and Jennings (2004), Vachon and Klassen (2006), Darnall *et al.* (2008)	Sustainable purchasing and supply strategy	Geffen and Rothenberg (2000), Maignan *et al.* (2002), Chen (2005), Chan *et al.* (2010), González-Benito *et al.* (2010)
		Improvement of the relationships with suppliers	Florida (1996), Narasimhan and Carter (1998), Walton *et al.* (1998), O'Toole and	Traceability and collaboration with suppliers	Carter and Jennings (2002), Schrage (2004), Van der Vorst *et al.* (2009),	Transparency and ethics in purchasing	Carter (2000), Eltantawy *et al.* (2009), Senge (2010),

(*continued*)

Traditional practices without continuity	Traditional practices with continuity		Sustainable practices-evolution		Sustainable practices-innovation	
		Donaldson (2002), Simpson and Power (2005), Autry and Golicic (2010)		Peloza and Falkenberg (2009)		Awaysheh and Klassen (2010)
	Supplier development	Walton *et al.* (1998), Narasimham and Das (2001), Handfiled *et al.* (2005), Carter (2005), Vachon and Klassen (2006), Wagner and Klause (2009)	Assessing supply risk	Norrman and Jansson (2004), Chopra and Sodhi (2004), Zsidisin *et al.* (2004), Juttner (2005), Kleindorfer and Saad (2005), Carr *et al.* (2008)	Supply chain risk management strategies	Christopher and Lee (2004), Choi and Krause (2006), Tang (2006), Manuj and Mentzer (2008), Matook *et al.* (2009)

Table IV.

Table V.
Traditional and sustainable BPs in the manufacturing area

Traditional practices without continuity		Traditional practices with continuity		Sustainable practices-evolution		Sustainable practices-innovation	
Internationalization of manufacturing/ relocation of facilities (low labor cost)	Vos (1991), Dunning (1993), O'Laughlin *et al.* (1993), Bolisani and Scarso (1996)						
		Waste management	Gupta and Sharma (1995), Sarkis and Dijkshoorn (2007), Daian and Ozarska (2009), Seadon (2010)	Source reduction and pollution prevention	Sugiyama and Imura (1999), Klassen (2000b), Srivastava (2007), Miller *et al.* (2008), Zarker and Kerr (2008), Senge (2010)	Environmental manufacturing technologies-cleaner production	Shrivastava (1995), Klassen and Whybark (1999a, b), Klassen (2000a), Theyel (2000), Vachon (2007), Li *et al.* (2010), Zeng *et al.* (2010)
		Outsourcing and postponement	Quinn and Hilmer (1994), Feitzinger and Lee (1997), Van Hoek (2001), Kakabadse and Kakabadse (2003), Jiang *et al.* (2006), Forza *et al.* (2008), Broedner *et al.* (2009), Kroes and Ghosh (2010)	Green manufacturing and remanufacturing	Guide *et al.* (1997), Johnson and Wang (1998), Gungor and Gupta (1999), Montabon *et al.* (2007), Rusinko (2007), Srivastava (2007), Zhu *et al.* (2008), Epstein (2009)	Closed-loop SC	Guide *et al.* (2003), Schultmann *et al.* (2006), Defee *et al.* (2009), Guide and Wassenhove (2009)
		Just in time operations	Clark and Fujimoto (1991), Kenney and Florida (1993), Flynn *et al.* (1995), Germain *et al.*	Integration of environmental efficiency in manufacturing	Guide *et al.* (1996), Klassen (2000), Sarkis (2001), Zhu and Sarkis (2004), Rao (2004),	Environmental conscious design (ECD)	Fiksel (1996), Zhang *et al.* (1997), Miettinen and Hamalainen (1997),

(*continued*)

Traditional practices without continuity	Traditional practices with continuity		Sustainable practices-evolution		Sustainable practices-innovation	
		(1996), Sakakibara *et al.* (1997), Fullerton and McWatters (2001), Mackelprang and Nair (2010)		Laugen *et al.* (2005), Tuttle and Heap (2008), Santos da Silva and Amaral (2009)	and life-cycle analysis (LCA)	Sroufe *et al.* (2000), Toffel (2003), Linton *et al.* (2007), Vinodh and Rathod (2010)
	Lean production/manufacturing	Womack and Jones (1994, 1996), Jones and Hines (1997), Levy (1997), Shah and Ward (2003), Ward and Zhow (2006), Taj and Berro (2006), Jayaram *et al.* (2008)	Lean and Total Quality Environmental Management (TQEM)	Klassen and McLaughlin (1993), Hanna and Newman (1995), Corbett and Cutler (2000), Kitazawa and Sarkis (2000), Curkovic and Sroufe (2007)	Lean and green operations	Florida (1996), Lewis (2000), King and Lenox (2001), Rothenberg *et al.* (2001), Kleindorfer *et al.* (2005), Larson and Greenwood (2004), Mollenkopf *et al.* (2010)

Table V.

Table VI.
Traditional and sustainable BPs in the W&T area

Traditional practices without continuity	Traditional practices with continuity		Sustainable practices-evolution		Sustainable practices-innovation	
None						
	Inventory reduction	Christopher and Towill (2001), Chin *et al.* (2004), Baker (2007), Gue (2007), Van der Vorst *et al.* (2009)	Inventory reduction and proper storage and transportation of hazardous materials	Carter and Jennings (2002), Srivastava (2007), Ciliberti *et al.* (2008)	Donation of excess or obsolete inventory	Carter and Jennings (2002), Stuart *et al.* (2005), Ciliberti *et al.* (2008)
	Cross-docking and the elimination of all non-value-adding activities	Simchi-Levi *et al.* (2000), Bartholdi and Gue (2004), Galbreth *et al.* (2008), Yang *et al.* (2010)	Extending JIT/lean approach to warehouse and transportation	Christopher (1992), Wu and Dunn (1995), Disney *et al.* (1997), Dong *et al.* (2001), Benton (2010)	Fuel efficiency, minimizing traffic and reducing noise pollution	McKinnon *et al.* (1993), Murphy *et al.* (1996), Goldsby and Stank (2000), Carter and Jennings (2002), Murphy and Poist (2003), Wee *et al.* (2005), Van der Vorst *et al.* (2009)
	Efficient delivery (ITC, standardization in packaging and delivery units, etc.)	Ahmad and Schroeder (2001), Lockamy and McCormack (2004), New (2010)	Recyclable and reusable packaging and containers	Kroon and Vrijens (1995), Rogers and Tibben-Lembke (2001), Sarkis (2003), Stuart *et al.* (2005), Panayides and Song (2008)	Selection criteria of for-hire carriers/reward systems linked to sustainability	Meade and Sarkis (2002), Richey *et al.* (2005), Ciliberti *et al.* (2008)

that does not mean, as shown in Table III, that these practices are not relevant in the sustainable context. Quality and environmental management systems extend their approach to report on different standards (such as GRI, codes of conduct, management systems and initiatives) (Gunaserkan and Kobu, 2007; Darnall *et al.*, 2008) and coordination between buying and supplying organizations goes beyond increasing commitment to collaborative relationships with others along the SC (Zach *et al.*, 2009; Kim and Lee, 2010). The collaborative relationships with suppliers and customers also allow companies to improve the performance of the SC by coordinating planning and information with ICT support, while at the same time designing and managing processes to achieve transparency and traceability (New, 2010).

The new BP "GrSCM" is beginning to receive increased interest from operations and SCM researchers and practitioners. Through this BP, the ecological impact of industries can be reduced, assuring cost, quality, performance, reliability and energy efficiency at the same time (Senge, 2010). Moreover, collaborating with unusual SC members (such as competitors, NGO's or trade groups) and addressing the governance structure for SSCM are other sustainable practices cited by several authors (Porter and Kramer, 2006; Peloza and Falkenberg, 2009; Poppo and Zenger, 2002; Mahapatra *et al.*, 2010). These authors note that companies are more inclined to benefit from links with NGOs when it is a matter of not of cash donations, but rather of expertise, making strategic know-how and in-kind resources available. The governance structure among organizations should control non-compliances, facilitate adapting roles, distributing rewards and responsibilities, including an exchange of objectives that are met, with minimum transaction costs and uncertainties.

Finally, as benchmarking identifies, adapts and implements the practices which result in the best performance by comparing performance data from similar processes or activities (Adebanjo *et al.*, 2010), it can be harnessed to enable sustainable improvements.

4.1 Purchasing

As shown in the first column of Table IV, supplier requirements that only emphasize economic criteria such as reducing costs annually or supporting minimum stock levels (Dyer, 1997; Millington *et al.*, 1998) are replaced by a framework of higher intensity relationships.

The benefits that can be derived from effective purchasing have their starting point at the selection and evaluation of supplier abilities. Indeed, according to Andersen and Skjøtt-Larsen (2009), evolving in the sustainable context, the authors argue that a crucial factor in generating competitive advantage is the ability to establish close, long-term relationships with suppliers and other strategic partners.

The first line of linked BPs in purchasing finalizes with local supplier development as innovative SBP. According to Porter and Kramer (2006), ensuring good health in a competitive context benefits both the company and the community. Bearing this in mind, the local availability of supporting industries can be an opportunity for CSR initiatives such as local supplier development.

In the second line of linked BPs, supplier certification is given as a traditional BP, previously associated with improving operational outcomes in purchasing. This is one of the few areas in the SSCM literature where environmental and social issues (such as unsafe working conditions and child labor) are dealt with (Pagell and Wu, 2009). Thereby, we have discovered a step forward in developing environmental purchasing and codes of conduct. However, companies that adopt GrSCM practices evaluate the environmental impacts of their first tier suppliers, but do not often control beyond that

first tier (Darnall *et al.*, 2008). Consequently, companies have to face the complexity of supplier relationships in a different and innovative way and to think holistically about their impacts. In doing so, long-term sustainable purchasing and supply strategies can be developed (González-Benito *et al.*, 2010).

The third line of linked BPs starts with improving relationships with suppliers. Certainly, the relationship between customer and supplier has been considered a key factor for the development of supplier abilities and performance increase (O'Toole and Donaldson, 2002). However, recent papers in the environmental management literature describe the supply relationship as being able to leading to programs of collaborative waste reduction, environmental innovation at the interface, cost-effective environmental solutions, rapid development and uptake of innovation in environmental technologies. This also allows customer firms to grasp a greater understanding of the environmental impacts of their SCs. This requires information sharing that enables traceability along the SC process and a commitment to performance improvement through closer and more cooperative relationships to a collaborative framework (Van der Vorst *et al.*, 2009; Peloza and Falkenberg, 2009).

At the end of this third line of linked BPs, we introduce the holistic perspective of sustainability, which adds social and ethical concerns to the economic and environmental aspects through new practices of transparency (understood as how available the information of a company is to other companies in the SC) and ethics in purchasing (understood as carrying out transactions in a manner expected by society). Given the increasingly complex web of supplier and customer alliances, mergers and acquisitions, trends toward consolidation in many industries, along with sensitive data transference, supply management ethical responsibility is becoming increasingly important and more complex (Eltantawy *et al.*, 2009).

The last set of BPs in the purchasing area starts with supplier development (i.e. information sharing, assistance through training programs and technical and managerial assistance). We consider this traditional BP to be valid in the sustainable context because of the impact on a purchasing firm of its supplier development to enhance the capabilities or performance of its suppliers. This can then affect the buying firm's performance and competitive strategy (Wagner and Klause, 2009). Linked to this approach, we posit the assessment of supply risk as the next step in sustainability. Assessing supply risk is critical for managing the risk inherent in a firm's overall supply network. The reason for this is that a supplier's failure to deliver inbound purchased goods or services can have a detrimental effect on the purchasing firm and, subsequently, have repercussions in the downstream SC (Zsidisin *et al.*, 2004). In this context, SC globalization introduces a complexity factor that makes it necessary to go beyond the assessment of supply risk. Adopting supply risk management strategies is the advanced and innovative approach to dealing with growing risks and complexity, but also the opportunities in global SC. Manuj and Mentzer (2008) suggest several initial strategies such as postponement, speculation or avoidance as potentially effective methods for dealing with SC risk management.

4.2 Manufacturing

Several authors (see first column in Table V) have proposed theories to explain why companies start international manufacturing activities. The internationalization of manufacturing and the relocation of facilities to achieve low labor costs were considered relevant practices in the competitive context of the 1990s. But in global and sustainable SCs, allocation decisions cannot be based solely upon economic factors;

other factors should be considered that cannot always be expressed in financial terms such as government regulations, environmental and social impacts or community attitudes. Indeed, companies have reexamined their methods of doing business due to globalization (Fullerton and NcWatters, 2001).

Starting with the linked BPs in Table V, some operational practices such as waste management and eco-efficiency have been typical issues in previous research related to the environmental dimension of SSCM (Gupta and Sharma, 1995; Sarkis and Dijkshoorn, 2007). From a traditional point of view, waste generation, collection and disposal systems are planned as independent operations of waste management function. But however, the evolution of waste management from this approach to the consideration of waste management as an integrated process requiring a systems approach shows the success of allowing for paradigm shifts (Seadon, 2010). Taking into account that source reduction and pollution prevention are focussed on preventing pollution and waste rather than removing them after their generation (Srivastava, 2007), we have considered this practice as evolution of the traditional approach toward sustainability.

We have ended the first linked set of BPs in manufacturing with the innovative practices related to environmental manufacturing technologies and cleaner production. According to Fiksel (2003), sustainability has often been associated with resource constraints rather than a way to improve innovation, growth and prosperity. Consequently, the green manufacturing perspective emerges in 1990s. This perspective is supported by green or environmental technologies (methods, procedures and equipment) that minimize the environmental impact of industrial activities and protect the natural environment. Pollution control equipment, cleaner production technologies and ecological measurement instrumentation are examples of these technologies (Shrivastava, 1995). However, the investment required for implementing the green technologies makes it a strategic decision for companies (Li *et al.*, 2010), so it is highly desirable to explore the industrial difference in implementing cleaner production and its impact on business performance (Zeng *et al.*, 2010).

On the second line, we considered two practices that have long been recognized, but which have shown literature trends in the present context. Whereas outsourcing used to be chiefly relegated to procuring non-core components and services, the outsourcing trend today has expanded to include virtually every company activity (Kroes and Ghosh, 2010). Second, related to the postponement strategy, Van Hoek (2001) argues that time postponement strategies will be taken into consideration by flexible SCs operating in high demand risk environment. At the same time, the stricter regulations and the increased stakeholder pressures makes manufacturers reflect about the need of integrate environmental concerns into their practices, operations and strategic planning agenda. In this context, proactive and leading manufacturing firms are developing green practices in an effective manner (Zhu *et al.*, 2008). The scope of these practices in the manufacturing area goes beyond recycling to include production planning and scheduling, inventory management, reducing, recycling and remanufacturing (product/material recovery and reuse) (Srivastava, 2007).

To conclude this second level with the innovative approach, we propose the closed-loop SC concept. Firms who proactively engage in the sustainability challenge through their SC strategies not only address short-term gains in revenues and expense controls, but also focus on product design innovation to make the recapturing and remanufacturing of their products more viable. This is also occurs in SC network designs which enable an efficient forward and reverse product flow along the SC

(Defee *et al.*, 2009). The concept of closed-loop SC is garnering attention as a result of the recognition that forward and reverse SC need to be jointly managed.

The third line of linked practices starts with just in time (JIT) operations. There is a great deal of research demonstrating firm competitiveness increase by implementing practices framed in JIT philosophy such as waste reduction (MUDA) and quality and continuous improvement. In conclusion, these studies agree on JIT contribution as a manufacturing strategy in building a sustainable competitive advantage. However, there is emerging consensus on the need to integrate environmental, economic and business issues because this integration can improve productivity and environmental performance. Tuttle and Heap (2008, p. 95) posit the green productivity concept:

> Green productivity is a strategy for enhancing productivity and environmental performance simultaneously to achieve overall socio-economic development. It is the combined application of appropriate productivity and environmental management tools, techniques and technologies that reduce the environmental impact of an organization's activities, products and services while enhancing profitability and competitive advantage.

For this reason, some authors such as Santos da Silva and Amaral (2009) analyze the different methods and models proposed in the literature with the purpose of facilitating the evaluation of the environmental performance of industrial processes. They also propose a new one in order to simultaneously evaluate environmental impacts and related costs. The innovative BPs we see linked to JIT and environmental performance are the environmentally conscious design (ECD) and life-cycle assessment/analysis (LCA) of the product. Due to the fact that these tools contribute to the real integration of environmental issues in the productive processes starting with design and continuing throughout the manufacturing, use, recycling and reuse of a product (its entire life cycle).

Finally, we have highlighted the evolution of lean production/manufacturing as part of the sustainable context. The lean manufacturing/production strategy introduced by Toyota represents the change from the mass production system perspective to the JIT production. Womack and Jones (1996) studied how to extend this philosophy to other companies. They consider that lean manufacturing is a way of thinking, involving a culture taken on board by all members of the organization. It is a system with no waste in terms of equipment, materials, parts and working time, so that only what is essential to production is included (Taj and Berro, 2006).

Taking this objective into account, the concern for sustainability has led to the development of concepts such as total quality environmental management. According to Curkovic and Sroufe (2007, p. 560), this term is collectively defined as:

> […] an economically driven, system-wide and integrated approach to the reduction and elimination of all waste streams associated with the design, manufacture, use and/or disposal of products and materials.

Waste minimization allows companies to reduce disposal costs and permit requirements, avoid environmental fines, boost profits, discover new business opportunities, rejuvenate employee morale and protect and improve the state of the environment (Hanna *et al.*, 2000).

The synergies between lean and green strategies are the current focus of research literature. King and Lenox (2001) and Larson and Greenwood (2004) analyzed the connections between lean manufacturing and green manufacturing. They discovered some synergies but they also discovered that putting them to use is not simple. Mollenkopf *et al.* (2010) have revealed drivers and barriers along with converging and

contradictory points across the green, lean and global SC strategies. According to the authors, although some strategies do not seem naturally synergistic, the benefits gained by understanding the possible trade-offs and optimization could lead to future performance enhancement. Recently, Piercy and Rich (2015) have developed a model that integrates both sustainability and lean in a single framework; they also highlight an evolutionary pathway for the implementation of both areas.

4.3 W&T

In the W&T area we have not found any traditional BPs without continuity in the sustainable context. Traditional BPs in this area are mostly focussed on cost reduction and have evolved to incorporate environmental and social issues as it is shown in Table VI.

First, inventory is considered one of the seven MUDA (waste) in the lean manufacturing and lean SC philosophy. Therefore the reduction of this must be an important goal to pursue. Baker (2007) notes that there have been several SC taxonomies, such as the agile SC, which stresses the need for inventory reduction. However, other authors such as Christopher and Towill (2001) recognize that inventory can be a key factor in developing lean/agile strategies in the SCM; the holding of "strategic inventory" at decoupling points can act as a buffer, separating lean production activities from an agile response to volatile market places.

Nevertheless, in relation to the role of inventory, Baker (2007) reflects on the part played by warehouses which have key functions such as inventory holding and the servicing of customer orders from that inventory. However, other functions for warehouses are being considered as increasingly important as they shift from a traditional approach to a sustainable one. The concern about environmental and safety issues involves reducing inventory and ensuring proper labeling, documentation, packaging and warehousing of hazardous materials that must then be properly transported (Carter and Jennings, 2002; Ciliberti *et al.*, 2008). Indeed, as an innovative sustainable practice linked to inventory, we have identified how a philanthropic action such as the donation of excesses to charity combines logistics improvement (inventory reduction/obsolescence avoidance) with CSR aims.

The second line of linked BPs goes back to the lean/JIT approach. The costs reduction and the amount of time inventory spends in the SC have been the focus of attention in the improvement of SC efficiency. To reduce time and costs the cross-docking strategy emerged in the operations management scene.

Since it was introduced in 1992, the ECR initiative has changed the framework of the relationships in the grocery SC by introducing cross-docking and the elimination of non-value-adding activities such as BPs (Mejías-Sacaluga and Prado-Prado, 2002). By accelerating inventory flows, the implementation of cross-docking reduces picking and storing activities, which are two of the most expensive activities in warehousing (Bartholdi and Gue, 2004; Galbreth *et al.*, 2008). Following this approach, we can consider the extension of JIT/lean values in this area as the next step on the way to sustainability in the manufacturing field.

However, Wu and Dunn (1995) conclude that JIT entails frequent deliveries, which generates further environmentally hazardous traffic. The trade-offs evaluated in most inventory models are primarily inventory carrying costs and transport costs. When the reduction in inventories outweighs the increase in transport costs, as is often the case with high-value parts, companies choose the JIT system.

Environmental and social costs of traffic pollution are not usually included in the inventory decisions. Therefore, innovative sustainable practices deal with fuel

efficiency, minimizing traffic and reducing noise pollution (Goldsby and Stank, 2000; Murphy and Poist, 2003; Wee *et al.*, 2005). And Wu and Dunn (1995) consider that some kind of problems such as pollution and traffic congestion could be minimized by supporting innovative management ideas with a good information system through more efficient loading, scheduling and routing.

The third and final line of linked BPs in the W&T area complemented all the other analyzed practices as it emphasizes normalization, source reduction and recyclable packaging in the delivery process. Similar to cross-docking, ITC implementation and standardization in packaging and delivery units are traditional BPs that facilitate the elimination of non-value-adding activities and improve delivery process efficiency (Ahmad and Schroeder, 2001; Lockamy and McCormack, 2004). The following step, taking into account the environmental impact, is the utilization of reusable and returnable packaging (Rogers and Tibben-Lembke, 2001; Sarkis, 2003).

Reusable and returnable packaging involve increased logistics costs. However, the total cost of the SC decreases in the long term due to the minimized reuse and disposal costs (Stuart *et al.*, 2005; Ciliberti *et al.*, 2008). For this reason, the innovative sustainable practices foster sustainable delivery processes through selection criteria of for-hire carriers and/or reward systems linked to sustainability (Meade and Sarkis, 2002). Accommodating returns into standard outward-bound distribution systems is no easy affair because of the lack of standardization in reverse distribution. Appropriate resources at managerial level should focus on developing innovative ways of handling returns. Finally, it may be possible to may be able to be standardized and handle certain aspects of returns as a matter of course.

5. Conclusions and future research

In the first part of our findings, Tables II and III show a comparative analysis of the traditional view of BPs in SCM with the sustainable view, where the connections are clear.

But, when specifying for each logistics area, the results have shown that some BPs that were accepted and extended in 1990s have lost relevance in the sustainable context. The main reason is that the activities that fall outside the intersection of economic and social performance and/or environmental performance have to be avoided (Carter and Rogers, 2008). With these practices appearing in the first column of Tables IV-VI, we have answered the part in *RQ1* regarding the practices that can be considered as hindrances, justifying the reasons why in Section 4.

However, answering the second part of *RQ1*, we have identified other TBPs originally focussed on economic performance (our "TBPs with continuity" in the sustainable context, which appear in the second column of said tables). In this regard, we agree with other authors that claim there is a need to develop innovative strategies, practices and technologies to progress into a true sustainability framework. However, we have shown that over the past two decades a considerable number of papers have dealt with different logistics practices that contribute to the economic performance of the firms. From a sustainable point of view, most of these practices continue to make the logistics process cost-efficient and can be considered as "sustainably acceptable" either because such practices can entail a positive impact in one of the other sustainability dimensions, or alternatively, because they are at least not penalized, even though they do not integrate them explicitly. Related to this idea, Dey *et al.* (2011) suggest some short- and long-term recommendations for companies to integrate sustainability in their SC. In the short term, the authors invite firms to "start today" and

"start simple," leading us understand that there are a good deal of things they can do that do not require a significant investment; in other words, companies do not start from nothing and should make the most of the progress that they have already made on the path to efficiency.

Related to our *RQ2* proposed, we have noticed that the literature demands the implementation of new or innovative practices along with new ways to implement the "traditional" practices. In this regard, companies should not limit themselves to thinking that it is sufficient to bolster their environmental and health and safety management systems in the workplace, or to slightly improve their negotiations with their suppliers in order to be sustainable. Complexity, uncertainty, cost balance, mindset and cultural changes and operationalization are, among others, challenges facing SSCM (Abbasi and Nilsson, 2012) and companies have to respond to these challenges with products, process and organizational innovations (Klewitz and Hansen, 2014).

The more recent literature makes us aware of the latest developments in this field: new terms such as "resource conservative manufacturing" in closed-loop SC domain (Asif *et al.*, 2012), "fair-trade and organic products" related to local supplier development or "sustainable entrepreneurship" (Kearins *et al.*, 2010) are examples of innovation practices from different perspectives and open a whole range of opportunities. Through our content analysis, new or innovative BPs have been summarized under generic names in the fourth column of Tables IV-VI.

In terms of *RQ3*, we posited the question about if it is possible to design a progressive path by linking traditional and innovative BPs for SSCM. From our point of view, the "SBPs-evolution" listed sets out the progressive path from the traditional approach of economic efficiency toward the more innovative practices within the framework of sustainability. Introducing sustainability elements into the logistics process is a strategic decision for companies and there is a need to investigate its impact on business performance in depth. In our opinion, this progressive approach offers several points to be considered in the decision-making process:

(1) Companies can take advantage of sustainable achievements (including cost savings) reached with the previously implemented TBPs (i.e. supplier certification, ISO 14001, health and safety standards, waste management, efficient delivery and standardization). This can be an important driver that could promote cultural change toward sustainability.

(2) Companies can face the challenge of innovation under two approaches: incremental/progressive innovation and radical innovation. Literature and the examples seen in companies have demonstrated that both approaches are not conflicting, and that resources and capacities are key factors in this dilemma. Sustainability in organizations should become a concern (and not only exist at a strategic level), to the extent of being a way of thinking and managing (reaching down to the tactical level), to finally become a way of working or a habit (and, therefore, involving the entire organization).

(3) A progressive approach could be of great interest to companies that are interested but have limited resources to transform their logistics process into a sustainable process. Literature review has also revealed that there is growing concern among academics and managers about the investment in resources that sustainability involves. This concern grows all the more since, on the one hand,

there is the increasing need for companies to channel their efforts into a greater sustainability while, on the other, there is the global recession which does not seem to be about to end in the short term, a crisis that is, to a lesser or greater extent, affecting all sectors.

These thoughts link up with *RQ4*: what is the best way to incorporate the BPs approach into SCM and logistics processes to achieve improved economic, social and environmental performance?

The results of our literature review allow us to respond to this question in a general sense but, at the same time, highlight some other issues for future research. The taxonomy of linked BPs proposed offers a set of opportunities to transform the logistics processes into more sustainable ones through concrete initiatives/practices. Thus, the SLR and the content analysis developed has allowed us to answer "what" actions to undertake and the progressive way, but now the global question is "how." Regarding this, we launch some specific questions:

(1) Which strategy gives the best results?: to start by focussing on a specific logistics area and launch various practices at the same time, or to develop practices, at the same time, in different logistics areas?

(2) How to involve the various agents intervening in the logistics process, from managers to employees, in implementing sustainable practices?

(3) How to measure the levels of progress made in sustainability throughout each of the different linked BPs under the TBL approach?

Related to the first questions, the analysis of the state-of-the-art in the SSCM field should be complemented by conducting empirical studies, with special attention on case study or action research methodologies in future research. Awareness of the BPs implemented by companies for improving the performance in sustainability, would not only enrich our proposal, but could also be interesting to analyze how different companies incorporate environmental and social issues into their cost-efficient logistics process. This future research should strongly differentiate the realities of multinationals, medium-sized companies and the small ones. Likewise, as important as the analysis of the internal-firm sustainability is, the inter-firm analysis is particularly interesting in logistics processes for a more holistic assessment of sustainability in SCM.

Further to the second question, researchers should consider the organizational changes required for the sustainable approach. Appropriate structural and behavioral management components will be key factors in developing SCM sustainability. Furthermore, the role of managers and employees has to be explored and there is a need to develop metrics to assess the influence of personal involvement in sustainable performance.

As regards how to measure the results in sustainability, developing appropriate metrics in support of SSCM under the TBL perspective is a constantly repeated demand. In the logistics context, this implies going beyond the classic analysis of trade-offs such as inventory cost vs transport cost, or customer service vs logistics costs, and to take environmental and social costs vs benefits into consideration for each BP.

In the same way, we have listed some SBPs apparently only related to the environmental dimension of sustainability such as ECD and life-cycle analysis (LCA) and some others apparently only related to the social dimension, such as local supplier development or the donation of surplus or obsolete inventory. But the intersection of

the three dimensions of sustainability can be highlighted by delving further into each of the BPs. ECD and LCA have consequences for the well-being of society besides economic implications; donating surplus or obsolete inventory can be understood as a philanthropic initiative, but also as an economic one (warehouse cost savings) as well as environmental (risk of obsolescence leading to contamination), thus, the implications are implicit. It is precisely these measurement indicators, under the TBL perspective, where further research is called for. There is a clear opportunity to study sustainability dimensions in more depth as opposed to in isolation.

Finally, there are some research limitations, despite the contribution made by this paper. First, the results have been developed on the basis of a SLR, which could still be more comprehensive notwithstanding the long list of updated reviews papers along with the observed 20-year time frame. Second, the list of papers included in our selection could be considered subjective even though we have used the "discursive alignment of interpretation" method to ensure data analysis inter-subjectivity. Nevertheless, we have tried to ensure a rigorous research process by following a structured process approach and by involving several researchers throughout the different research phases.

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About the authors

Dr Ana M. Mejías received her PhD in Industrial Engineering from the Universidad Politécnica de Madrid (UPM-Spain). She is a Tenured Professor at the University of Vigo and she is a Vice Dean in the Industrial Engineering School. Her research interests relate to the sustainable supply chain management and the continuous improvement. She is the author of many papers in international journals and scientific conferences. Dr Ana M. Mejías is the corresponding author and can be contacted at: mejias@uvigo.es

Dr Enrique Paz is a Tenured Professor at the School of Industrial Engineering, University of Vigo (Spain). He received a MS in Industrial Engineering from the University of Vigo in 1991 and a PhD from the University of Vigo Department of Systems Engineering and Automation in 1997. His work focusses on mobile robots applications, computer vision and automation. He is the author of many papers in international journals and scientific conferences. Dr Paz has participated in several funded research projects during the last 15 years.

Dr Juan E. Pardo is a PhD in Industrial Engineer. He is a Tenured Professor at the University of Vigo. Dr Pardo has 20 years of experience in action research projects in production, operations management and information systems. He is the author of many papers in international journals and scientific conferences.