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Review

Evolution of sustainability in supply chain management: A literature review

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ABSTRACT

An ever-increasing demand for products and their consumption has put pressure on industrial output and their supply chains, and that demand has resulted in negative impacts on the environment and society. Increasing rates of pollution and environmental calamities caused by industrial production have urged several researchers and industry experts to work on Sustainable Production and Consumption issues within the context of Sustainable Supply Chain Management (SSCM). This paper comprehensively covers the exponential growth of the topic through an evolutionary lens. This article attempts to understand the evolution of sustainability issues by analysing trends across industries, economies, and through the use of various methodologies. A comprehensive thematic analysis was performed on 1068 filtered articles from 2000 to 2015, highlighting the development and importance of the body of knowledge. The study proposes a conceptual framework to classify various factors along the triple bottom line pillars of sustainability issues in the context of supply chains. An in-depth study is conducted on 190 articles covering all pillars of sustainability (as per the proposed conceptual framework) on SSCM. We observe that studies focusing on all three dimensions of sustainability are comparatively scarce. More focus on industry-specific studies is required because problems addressing industries that are serious polluters, especially those in emerging economies, remains largely unaddressed. It is observed that the studies addressing social issues are scarce, and more focus is required on the measurement of social impacts along the supply chain. Finally, we propose future avenues to extend research on the SSCM domain while keeping in mind the need to address industry specific and economy specific problems from the triple bottom line perspective.

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1. Introduction

With growing market demand for various products in the latter half of the 20th century, many organizations ventured into risky but frugally profitable modes of production. However, these actions often compromised long-term impacts both on society and the environment. The world has faced some disastrous industrial accidents: the largest oil spill from an Amoco Cadiz oil tanker March 16, 1978 (in France), the largest chemical plant accident, better known as the Bhopal Gas tragedy on December 2, 1984 (in India), the Chernobyl nuclear disaster on April 26, 1986 (in Ukraine), and the Exxon Valdez Oil Spill on March 24, 1989 (in the US). Accidents such as these have forced stakeholders, including regulatory authorities, manufacturers, customers, and the public, to reconsider economic business models and to question the implications of business practices on society and environment.

The need for changes in industrial practice and consumption patterns for sustainability was the focus of the *Brundtland Report*, published in 1987 by the World Commission on Environment and Development (WCED), under the Kyoto protocol (Dehghanian and Mansour, 2009). The WCED defines Sustainable Development (SD) as "[a] development that meets the needs of the present without compromising the ability of future generations to meet their own needs." Since then, interest in sustainability related studies in various business disciplines has grown steadily. Sustainable Consumption and Production (SCP) practices, together with the management of natural resources and poverty eradication, form the three pillars of sustainable development emphasizing social, economic, and environmental studies: the Triple Bottom Line (TBL) (Joyce and Paquin, 2016).

Since the late 1990s, a marked increase in sustainability concerned articles (or reports) has occurred. Initial studies focused on how Operational Research tools can play an important role in visualizing and solving environmental problems. From early 2000s, Sustainable operations management developed as an area that integrates environmental and social issues along with economic aspects of supply chains into a common framework (Seuring and Müller, 2008). Hence, this field of study has attracted researchers as well as practitioners to study various aspects of sustainability over the past 25 years. The main drivers for this transition were the rapid pace of production and consumption aided by advanced technologies, and the increased exploitation and pollution of natural resources for economic development (with hindsight provided by the various industrial disasters). Over recent years, because society has evolved in developed countries, more stringent laws to protect the environment have been implemented, laws that mandate binding environmental legislation. Further, customers have imposed pressures on regulators and the entities involved in the business (Hall, 2000). Sustainable or green management initiatives have been adopted to reduce costs and to increase efficiency, internal and external customer satisfaction, and market shares and sales, resulting in more effective risk management (Bansal and Roth, 2000; Lintukangas et al., 2016). Some organizations still have reservations on the net benefit from the above-mentioned sources as compared to the investment required to adopt sustainable production and consumption practices.

The stringent environmental and social laws in developed countries have led some companies to choose to outsource the polluting segments of their business to other economies (both emerging and underdeveloped), where laws are not in place or are not properly implemented (Liu et al., 2007; Dasgupta et al., 2002). These emerging and underdeveloped economies need external sources of funding/technology to provide growth to their economy. Often the emerging nations tend to compromise their social and environmental standards for economic growth (Meyer, 2004). This practice negates the "green initiatives" taken by companies and the net environmental and social impact on the globe may have shifted location, but it remains unchanged.

This awareness led to the evolution of Green Supply Chain Management (GrSCM) to evaluate environmental impacts on efficient supply chain operations. Srivastava (2007) defines (GrSCM) as "integrating environmental thinking into supply-chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to the consumers as well as end-of-life management of the product after its useful life." GrSCM generally focuses on environmental and economic aspects of operations and fails to address social concerns, which is one of the major objectives of Sustainable Development (Dehghanian and Mansour, 2009). This progression has led to the emergence of "Sustainable Supply Chain Management (SSCM)" as a dominant research domain from 2010 onwards. SSCM is defined as "The creation of coordinated supply chains through the voluntary integration of economic, environmental, and social considerations with key inter-organizational business systems designed to efficiently and effectively manage the material, information, and capital flows associated with the procurement, production, and distribution of products or services in order to meet stakeholder requirements and improve the profitability, competitiveness, and resilience of the organization over the short- and long-term" (Ahi and Searcy, 2013). Global companies such as IBM, Hewlett-Packard, and Xerox have rapidly integrated the perspective of sustainability into their supply chains by taking the necessary environmental steps including design of reusable products (Sheu et al., 2005).

The Economist Intelligence Unit (EIU) warns that even if global warming is held at plus *2 degree Celsius* by 2100, private investors may lose 4.2 trillion USD on the value of their holdings from the impact of climate change (The Guardian, 2015). The impact on business due to climate change and social disparity is extremely serious and will significantly impact the economic sustainability of both developed and emerging countries. SSCM is an interdisciplinary domain catering to requirements of both environmental sciences and management sciences (Linton et al., 2007). Since early 2000s, both academicians as well as practitioners in the field of GrSCM and SSCM have conducted research covering a wide range of issues (Govindan and Soleimani, 2017). This study intends to map the developments in the area of sustainability in supply chain management literature through a detailed literature review. We perform a thematic analysis of research papers published in top journals on TBL leading to "Evolution of Sustainability in Supply

Chain Management." The evolutionary approach used to conduct this literature review identifies various historical research phases (Luiz et al., 2016) and depicts the growth of sustainability studies in supply chain literature. The major objectives of this study are to:

- Analyze the progress of sustainability research within supply chain management literature in recent years across various themes of study (e.g. trends, journals focusing on these issues, industry specific studies, types of methodologies used, quantitative studies, etc).
- Understand the development of SCM literature through Triple Bottom Line (TBL) framework vis-a-vis various issues/functions leading to Sustainability.
- Study the development of SSCM literature which simultaneously addresses all factors of TBL along the supply chain.

The detail of the methodology adopted to carry the entire study has been presented in Section 2. A significant number of literature reviews (59) were observed on various issues under each element of TBL. Hence, Section 3 provides an understanding of the existing literature to justify the need of the current paper. A detailed thematic analysis is presented in Section 4, as well as insights we derived to understand the evolution of the sustainability issues in Supply Chain literature. We also performed an in-depth thematic analysis of studies on development of SSCM literature. Finally, the conclusions of the entire study, including the future scope of SSCM research and some limitations, have been outlined in Section 5.

2. Methodology

The present study summarizes the existing literature on sustainability in the supply chain management domain based on various themes. This article also helps future researchers to understand the development of the concept of sustainability as viewed through the triple bottom line perspective. To accomplish this objective, the literature review is based on the methodology proposed by Seuring and Müller (2008). Based on the process model proposed by Mayring (2004), various themes were defined and delimited, and articles were collected based on those specific themes. Literature resources were collated for understanding the evolution of SSCM by using a keyword search in popular databases such as EBSCO, Scopus, and so forth. The keywords used were sustainable supply chain management, green supply chain management, green marketing, green purchasing, green design, green logistics, reverse logistics, closed loop supply chain, environmental purchasing, green manufacturing, green supplier selection, and environmental supplier selection. Out of more than 2500 papers that appeared for the period 2000 to 2015, only articles published in peer reviewed journals using English language were selected. Authors did a quick content check to assess the quality and rigor with which articles are published in various journals to finalise the set of journals to be included. Preference was given to papers published in reputed journals like A and B category journals (following the ABDC/ABS journal quality list from 2013). Based on H index and SCImago ranking of journals, journals dedicated to green operations and sustainability were also included to obtain a comprehensive list of quality studies in this area. In the final stage, papers which specifically focused on managerial issues on sustainability in any part of the supply chain were selected for the study. We excluded papers which focused entirely on other domains such as green technologies and sustainable investing, or those that had only minimal focus on operations/supply chains issues. Content analysis of individual papers was done to finalise 1068 papers, which addressed the issues relevant to this study, the details of which are given in Table 1.

The initial descriptive dimensions were straightforward: year, industry, and methodology. We used an inductive approach to arrive at the classification schema for the sustainability perspective of the study. For reducing the selection and classification bias, three authors were involved in the entire process. We note that in the collated literature, a large quantity of "literature reviews" were developed during the studied 15 years. Hence, the next section attempts to understand the growth of literature resources using the reviews as reference and highlighting how the present study differentiates from existing literature reviews.

3. Reviews conducted over 2000–2015 for understanding evolution of SSCM

The sustainable development concepts are based primarily on three dimensions: Economic, Environment, and Society (popularly termed as TBL). It was observed during the study that in addition to the TBL existing in sustainability literature, the combination of two pillars significantly contributes to the evolution of the body of knowledge on Sustainability in Supply Chain Management (SSCM). Henceforth, in our study we have categorised them as three additional sub-dimensions as follows: Socio-Economic (social + economical pillars), Socio-Environmental (social + environmental pillars), and finally GrSCM (economical + environmental) dimensions. Fig. 1 represents the broad framework on which the current study is based.

Fig. 1 clearly indicates that several literature reviews (59) have been conducted on the various issues applicable to the dimensions and sub-dimensions of the evolution of SSCM body of knowledge. It is also clear that there is a lack of literature reviews in the study period on both Social and Socio-Environmental aspects influencing the evolution of SSCM. On the other hand, a significant collection of literature reviews (18) pursue the various issues that focus solely on SSCM.

Considering the sizable presence of literature reviews (59 in total), Fig. 2 attempts to understand the growth of the various dominant streams (Economic, GrSCM, and SSCM) over the study period (2000–2015). The first literature review appears in 2002, and it is clear that a quantum jump occurs in the total number of literature reviews from 2011 onwards. This observation may be attributed to the significant increase in studies on SSCM and GrSCM, and it may also be attributed to the series of special issues by leading journals across the academic marketplace. Special issues were found in *International Journal of Production Economics* [Sustainable Food Supply Chain Management (2014), Green Manufacturing and Distribution in the Fashion and Apparel Industries (2012)]; *Journal of Cleaner Production* [Integrating Cleaner Production into Sustainability Strategies (2015), Sustainable Development of Energy, Water and Environment Systems (2015), Making Progress Towards More Sustainable Societies through Lean and Green Initiatives (2014)]; *International Journal of Production Research* [Sustainable Supply Chain Management and Reverse Logistics (2012)]; *European Journal of Operations Research* [Eco-Efficient Green Supply Chain Management (2012), Green Supply Chain (2014)]; and *Journal of Supply Chain Management* [Theory Building Surrounding Sustainable Supply Chain Management (2015)]. These observations clearly highlight that academicians, as well as practitioners, have realized the importance of SSCM as a vital body of knowledge and that it plays a major role in creating the future roadmap of an economy's growth. Table 2 provides the details of various literature reviews conducted in the period of study highlighting the objective of study as well as the dimensions and sub-dimensions.

Most of the existing studies focus on specific topics in SSCM; details are provided in Table 2. The various issues studied in SSCM

Table 1
Stages involved in the selection of articles for this Study.

Stage	Details	Number of records
Stage 1: Keywords search	• Keywords: "sustainable supply chain," "green supply chain," "green purchasing," "green marketing," "green design," "green logistics," "reverse logistics," "closed loop supply chain," "environmental purchasing," "green manufacturing," "green supplier selection," "environmental supplier selection," "sustainable supplier selection." • Search Databases: EBSCO host, SCOPUS, and Science direct • Search space: Title OR Abstract OR Keywords • Article type: Academic/scholarly and peer-reviewed journals • Time range: Published from January 1, 2000 to June 15, 2015	2500
Stage 2: Select and sort	• Inclusion criteria: Article should be published in A and B category journals as per ABDC/ABS ranking OR published in journals dedicated for green operations and sustainability • For other journals: Articles must have standards of perceived quality of relevance, rigor, and readability (H index and SCImago ranking was considered)	1500
Stage 3: Refined select and sort	• Inclusion criteria: Articles addressing issues in sustainability or environmental or social performance of whole or part of supply chain • Exclusion criteria: Working papers, Conference papers/proceedings, Company/Industry reports, Market reports, Editorials and News reports. Articles written in any language other than English.	1068

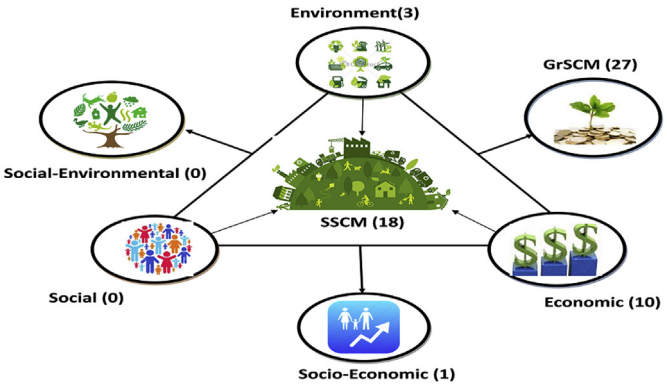

Fig. 1. Framework Indicating Published Literature Reviews in Evolution of SSCM. Note: Number in the brackets indicates the number of reviews in the respective dimensions in period of study.

under various literature reviews focus on metric development, stakeholder pressure, leadership, governance, application of theories (like dynamic capability, decision theory, review of multi-tier supply chain and CLSC), performance measurement, quantitative models in SSCM, and decision theory in SSCM. In Table 3, "General reviews" incorporate various thematic and content analysis on SSCM or GrSCM. Existing highly cited [greater than 50 (source: Google Scholar)] literature reviews on SSCM, based on research conducted prior to 2012, include Seuring (2013, 2008), Hassini et al. (2012), Ashby et al. (2012), Carter and Liane Easton (2011), Gold et al. (2010), and Brandenburg et al. (2014). Despite the existence of large numbers of literature reviews on SSCM literature, a comprehensive analysis that covers all research areas simultaneously with an updated literature review (post-2011) could not be found. In this study, more than 65% of the collated literature were from 2011 to 2015. This paper is an update on previous general literature reviews from Ashby et al. (2012) (using 134 papers published up to 2011), Carter and Liane Easton (2011) (using 130 papers published up to 2010), Seuring and Müller (2008) (using 191 papers published up to 2007). This research considers a large sample of sustainability-based supply chain management articles from a broader perspective of sustainability based on TBL perspective.

Table 3 provides a list of the top 22 frequently cited literature review papers (with greater than 50 citations) from various dimensions and sub-dimensions categorized into supply chain issues over the period of study. This categorization of SSCM literature development helps in the understanding of the issues which have already been researched significantly over the period of study. It also identifies issues to be investigated in the future in order to track growth in SSCM literature. Manufacturing and strategy domains did not have any frequently cited literature reviews, but distribution and CLSC reviews are heavily cited, which clearly indicates the current research emphasis of Supply Chain Management studies.

Hence, because the present study provides a detailed thematic analysis in the evolution of SSCM, it will help future researchers to

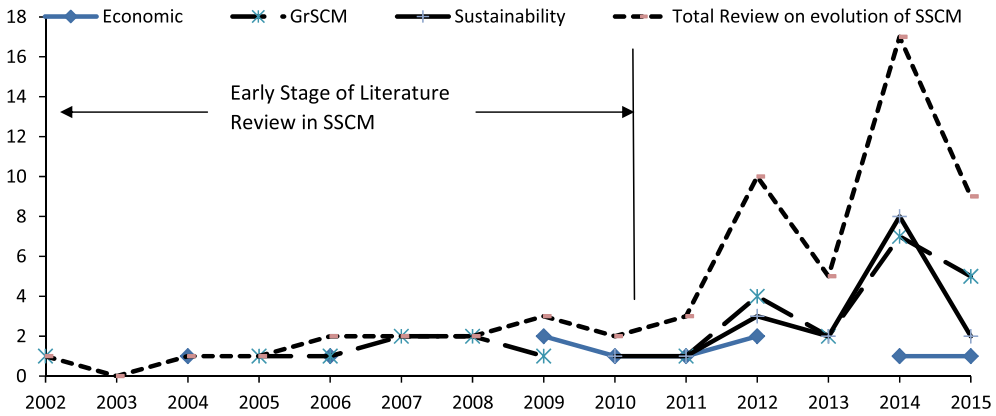

Fig. 2. Literature review studies on various dimension of SSCM evolution.

Table 2
Details of literature review leading to evolution of SSCM.

Ref No.	Source'	Issue studied	Objective	Dimensions/ Sub-dimensions
1	Agrawal et al. (2015)	Closed loop supply chain	Issues in forecasting product returns, adoption and implementation, RL networks from secondary market perspective, outsourcing, and disposition decisions	Economic
2	Ahi and Searcy (2015)	Others (metrics development)	Review of various metrics used in GrSCM and SSCM	SSCM
3	Chatha and Butt (2015)	Manufacturing strategy	Manufacturing strategy (ms) discipline with a focus on thematic developments	GrSCM
4	Fahimnia et al. (2015)	Others (general review)	Thorough bibliometric and network analysis	GrSCM
5	Govindan et al. (2015b)	Green purchasing	Green supplier selection process	GrSCM
6	Meixell and Luoma (2015)	Sustainable strategy	Stakeholder pressure in SSCM	SSCM
7	Touboulic and Walker (2015)	Green strategy	Theoretical perspectives used in SSCM research	GrSCM
8	Wong et al. (2015)	Green strategy	Green supply chain integration strategies	GrSCM
9	Zorzini et al. (2015)	Social purchasing	Socially responsible sourcing	Socio-Economic
10	Beske et al. (2014)	Sustainable strategy	Use of dynamic capabilities in SSCM in food industry	SSCM
11	Lin et al. (2014)	Green distribution	Review of green vehicle routing problems	GrSCM
12	Paul et al. (2014)	Green manufacturing	Review on green manufacturing	GrSCM
13	Brandenburg et al. (2014)	Others (general review)	Review of studies in forward supply chains using quantitative methods that focus on social and environmental factors	SSCM
14	Patala et al. (2014)	Green strategy	Review various forms of eco-industrial networks for improving environmental sustainability.	GrSCM
15	Gosling et al. (2014)	Others (leadership)	Content-based literature review on the intersections of supply chain leadership, supply chain learning and SSCM	SSCM
16	Bush et al. (2014)	Others (governance)	Reviews the integration of sustainability governance in literature on sustainable supply chains and networks	SSCM
17	Bostrom et al. (2014)	Others (governance)	Explore challenges in governance of global supply chains and networks which prevents them from becoming sustainable and responsible	SSCM
18	Chin et al. (2014)	Green strategy	Review of the relationship between environmental uncertainty, external integration, and firm performance	GrSCM
19	Alexander et al. (2014)	Sustainable strategy	Decision theory concepts used in SSCM	SSCM
20	Tachizawa and Yew Wong (2014)	Sustainable strategy	Management of sustainability of multi-tier sub suppliers and supply chains	SSCM
21	Bhatia and Chand (2014)	Others (general review)	Issues studied in GrSCM literature	GrSCM
22	Kanonuhwa and Chimucheka (2014)	Green marketing	Green marketing methods and their impact on purchase behaviour of Generation Y consumers	GrSCM
23	Chu et al. (2014)	Green manufacturing	Green technology development in GrSCM	GrSCM
24	Demir et al. (2014)	Green distribution	Review of research in green road transportation	GrSCM
25	Govindan et al. (2015a)	Closed loop supply chain	Review of recently published papers in closed-loop supply chain and reverse logistics in academic journals	SSCM
26	Tao and Yin (2014)	Closed loop supply chain	General review of the reverse logistics network literature	Economic
27	Gaussin et al. (2013)	Green strategy	Environmental footprint methods of manufactured products	Green
28	Igarashi et al. (2013)	Green purchasing	Green supplier selection methods	GrSCM
29	Taticchi et al. (2013)	Others (performance measurement)	Performance measurement methods in SSCM	SSCM
30	Winter and Knemeyer (2013)	Others (general review)	Review the recent state of thought development across three disciplines (operations, social, and environmental management)	SSCM
31	Chun and Bidanda (2013)	Green purchasing	Sustainable manufacturing published in IJPR	GrSCM
32	Seuring (2013)	Others (general review)	Paper summarizes research on quantitative models for forward supply chains	SSCM
33	Hassini et al. (2012)	Others (matrices development)	Review of SSCM with focus on matrices	SSCM
34	Tang and Zhou (2012)	Others (general review)	Review of operations research/management science (or/ms) research developments in SD	GrSCM
35	Abbasi and Nilsson (2012)	Others (general review)	A systematic review of five major areas of supply chain management: complexity, costs, mindset, operationalization, and cultural changes and uncertainties	GrSCM
36	Ashby et al. (2012)	Others (general review)	Literature review to understand SSCM structures, processes, connections, and limitations	SSCM
37	Kronborg Jensen (2012)	Green strategy	Product carbon footprinting development in GrSCM	Environment
38	Dekker et al. (2012)	Green distribution	Review of design, planning, and control in a supply chain regarding decisions of inventory of products, transportation and facility decisions	GrSCM
39	Sheriff et al. (2012)	Closed loop supply chain	Framework to classify the impact of strategic level decisions on various issues/parameters in reverse logistics	Economic
40	Hazen et al. (2012)	Closed loop supply chain	Suggests a decision framework by identifying the critical components of the reverse logistics decision-making process	Economic

(*continued on next page*)

Table 2 (*continued*)

Ref No.	Source'	Issue studied	Objective	Dimensions/ Sub-dimensions
41	Gupta and Palsule-Desai, 2011	Others (general review)	Develop an integrative framework for existing literature under four categories, namely: strategic considerations; decisions at functional interfaces; regulation and government policies; and integrative models and decision support tools	GrSCM
42	Carter and Liane Easton (2011)	Others (general review)	General review of the SSCM for 20 years	SSCM
43	Hazen (2011)	Closed loop supply chain	Review of articles covering logistics disposition decisions from a strategic perspective and their impact on the primary themes developed	Economic
44	Gold et al. (2010)	Others (general review)	Review of application of JIT philosophy on reverse logistics systems	SSCM
45	Chan et al. (2010)	Closed loop supply chain	Developing a research framework in reverse logistics by classifying literature into six research categories	GrSCM
46	Setaputra and Mukhopadhyay (2010)	Closed loop supply chain	Review of closed loop supply chain management literature to develop a framework	Economic
47	Melo et al. (2009)	Closed loop supply chain	Development in research and practice in reverse logistics	Economic
48	Chamorro et al. (2009)	Green marketing	Review the main topics in articles on green marketing	GrSCM
49	Pokharel and Mutha (2009)	Closed loop supply chain	Review of analytic research on the closed loop supply chain economics and development of framework linking research, design, strategy, industrial engineering/operations and behavioural streams	Economic
50	Seuring and Müller (2008)	Sustainable supply chain	Development of conceptual framework for sustainable supply chain management by reviewing papers from 1994 to 2007	SSCM
51	Rubio et al. (2008)	Closed loop supply chain	Multidisciplinary fields in SSCM	GrSCM
52	Atasu et al. (2008)	Closed loop supply chain	Review of the literature on reverse logistics	GrSCM
53	Linton et al. (2007)	Others (general review)	General over view of studies covering sustainability in supply chain management literature	GrSCM
54	Meade et al. (2007)	Closed loop supply chain	Sustainable warehousing	GrSCM
55	Prahinski and Kocabasoglu (2006)	Closed loop supply chain	Review of literature in reverse supply chains (RSCS) and develop research propositions which can be studied using empirical research methods	GrSCM
56	Foulds and Luo (2006)	Green distribution	Trends in green distribution	Economic
57	Hervani et al. (2005)	Others (performance measurement)	Review of various methods used for performance measurement in green supply chain management and related issues	GrSCM
58	Chu and Song (2004)	Closed loop supply chain	Trends in reverse logistics	Economic
59	Baumann et al. (2002)	Green design	Review of policy, engineering and business perspectives in green product development field	GrSCM

Table 3
Most cited review papers in sample (list updated on 25 July 2015).

Issues	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Strategy														
Marketing								[48]						
Design	[59]													
Purchasing														[5]
Manufacturing														
Distribution											[38]		[11]	
SC performance				[57]										
CLSC					[55]	[54]	[51], [52]	[47], [49]						
Generalreview						[53]	[50]		[44]	[41], [42]	[32], [33], [34], [36]		[13]	

Note: Interested researchers may refer to Appendix A for the details of the research papers studied against the number provided in last column. Literature reviews published in 2015 are yet to gain citations.

identify areas, methodologies, and industries that require further attention. This study highlights the growth of knowledge in SSCM across various economies never explored before (refer to new framework in Fig. 1). Further, a wide spectrum of literature from many journals has been investigated, and multiple themes across various global economies. The most recent studies from 2011 to 2015 are included.

4. Classification and analysis

In this section a detailed thematic analysis of the 1068 selected papers is presented based on the proposed framework (Fig. 1) developed in this paper. Section 4.1 outlines the growth trend in sustainability-based research within SCM literature leading to its evolution to present studies. Subsequently, Section 4.2 maps these studies against the top journals (with at least ten publications in the period of study). Section 4.3 examines the development of the body of knowledge in SCM sustainability through various methodologies adopted. The collated studies were further classified into various industries in order to pursue why some specific industries attained a greater research focus during the study period. All these studies were done with respect to different economies' status (developed/developing classification based on United Nations classification of economies [UN, 2012]) to understand the focus of various

economies on the theme of study.

All the above mentioned sections also explore separately the studies conducted exclusively on SSCM literature. A thematic analysis of 190 identified studies on the growth of literature of SSCM (covering all the pillars of TBL) includes a trend analysis followed by a methodology and industry analysis. Finally, major issues in SSCM are discussed to understand the factors on which the majority of research studies has focused.

4.1. Time analysis of the evolution of SSCM literature

There is a trend of increasing interest towards various issues leading to development of sustainable supply chain research in last 15 years (Fig. 3). There has been a steep increase in the number of relevant publications, especially sustainable and GrSCM, after 2010. This pattern of growing interest on various issues of SSCM is similar to that observed in Evolution of Literature reviews in the SSCM (Fig. 2). In developing countries' context, there has been a significant increase in interest towards SSCM and GrSCM research, with nearly 250 publications in this area in 2014 alone. Authors feel that the trend may be categorized into three phases as represented in the figure.

The Kyoto Protocol discussion was conducted in Kyoto, Japan, on 11 December 1997 and was entered into force on 16 February 2005. This lead to State Parties agreeing to reduce greenhouse gases emissions, by accepting the facts that (a) global warming is a reality and (b) CO2 emissions from human activities have caused it. Hence, Phase I represents a period when the Kyoto Protocol was not yet put into force, and industries were still driven by economic business models. In Phase II, however, the Kyoto Protocol was instituted, making developed nations reduce their greenhouse emissions significantly. Thus, more studies could be found in developed countries when compared to emerging markets, and no studies were made in underdeveloped markets.

In the Copenhagen Climate Council, major world nations met in December 2009 to create global awareness of the significance of the UN Climate Summit and to ensure that global decision makers could agree on a new climate treaty to replace the 1997 Kyoto Protocol. At nearly the same time, some major industrial catastrophes occurred, including the BP Gulf of Mexico oil spill (2010) and the Fukushima Daiichi nuclear power plant disaster (2011). These industrial accidents presented global economic, environmental, and social damages, and the world became aware that the impacts from these disasters would last for multiple decades. These incidents may have increased scholarly attention towards SSCM; literature offerings showed steep growth with a greater emphasis on both developed and developing economies. While the majority of the publications were generic in terms of geography, many papers utilized data of a particular country to validate their findings. For the above classification on economies, the residence of the first author (instead of the country from which data is collected) has been considered.

4.1.1. SSCM specific studies

The purpose of this classification is to identify the economies which have received greater focus in the evolution of SSCM. Developed economies (59%) lead in the evolution of SSCM, and no study could be observed from underdeveloped economies. This difference may be due to less industrialization or to more difficulty in conducting research in such countries because of poor economic or regulatory conditions. Developed economies, on the other hand, have already attained high industrial growth and thus provide a high human development index. Accordingly, stringent regulatory acts already consider environmental and societal benefits with an understandable emphasis on sustainability issues. Emerging countries lag behind in research due to a general lack of data availability; there are poor disclosure norms and management mechanisms are difficult to obtain. Still, developing countries have started appreciating the importance of sustainable development, and over the past five years, an increase in scholarly emphasis on SSCM can be observed.

Fig. 4 indicates the progress of literature on the area of SSCM considering the TBL. The trend analysis again complements the observation in Fig. 3 that most of the studies in the SSCM literature have been in developed countries as compared to developing countries. Similar observation can be made on the significant growth in the literature post-2011 with a number of special issues in top journals such as IJPE, IJPR, and JCP over the past five years. This increase could be attributed to regulatory pressures or to customer awareness on environmental and social impacts, both of which have increased over the period of time. This trend clearly should motivate researchers in emerging markets to conduct more

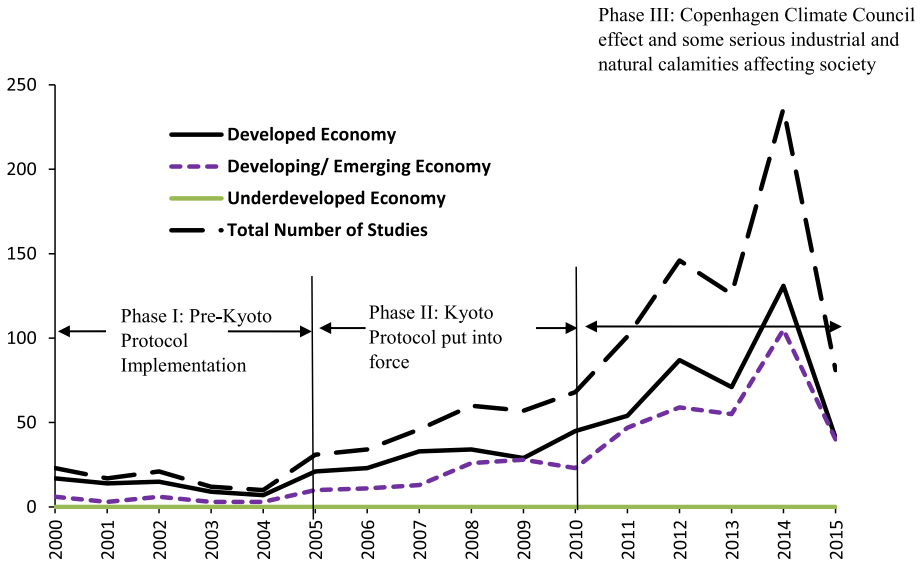

Fig. 3. Evolution of sustainability in SCM (from Economic-Environmental-Society). (Note: There is a dip in 2015 as data was collected only up to 15 June 2015).

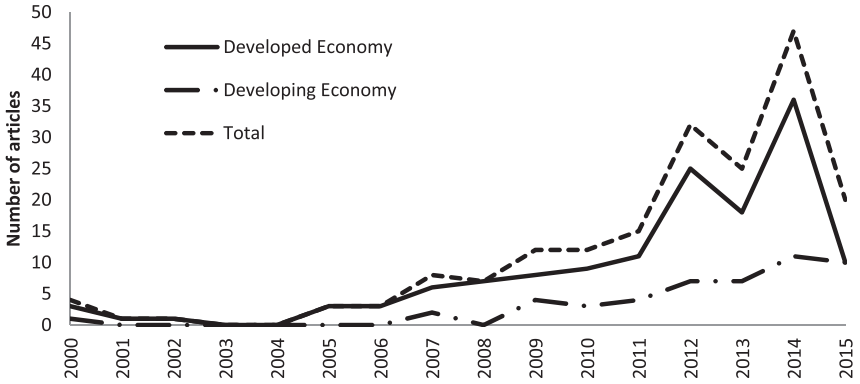

Fig. 4. Number of studies on SSCM issues (2000–2015).

research and to develop frameworks for the practitioners to improve the objective of Sustainable Development (using sustainable consumption and production practices).

4.2. Contribution towards literature from various journals

Most of the publications in the process of evolution of SSCM were published in journals such as IJPE, IJPR, JCP, EJOR, IJPDLM, and others. Fig. 5 below lists the journals with more than ten publications in last 15 years for the data covered in this study; that emphasis demonstrates a dedicated focus to the most essential research areas in the present era. Journals (outside ABDC/ABS journal list 2013) with higher publication numbers have also been considered, such as the *Journal of Cleaner Production* (JCP), which deals exclusively with issues related to cleaner manufacturing and production with high impact factors. This list clearly indicates the increased focus of journals on sustainability. Journals like *Industrial Marketing Management* or *Journal of Consumer Marketing* are also publishing topics related to GrSCM and SSCM with a focus on green marketing.

The highest number of articles was published in *International Journal of Production Economics*, with a total of 101 articles from both developed and developing economies. Articles were published in journals from multiple areas like operations, marketing, economics, etc. This range may be attributed to the series of special issues as discussed in Section 3. Researchers working in Sustainable Supply Chain Management areas can target these journals to locate the most favourable audience for their findings and analysis. In this study, almost sixty percent of the articles studied are covered in twelve percent of the leading journals in management. We observed that a significant proportion of studies, in most journals, examined developed economies as opposed to emerging economies. This might be due to the lack of data availability which causes difficulty for researchers in emerging economies.

4.3. Methodological classification of evolution of SSCM literature

The literature on evolution of SSCM has been classified on the basis of methodology followed in conducting the research, as follows: conceptual (including theoretical), surveys (including secondary data analysis), case studies approach, mathematical/analytical modelling, and literature reviews. Fig. 6 shows that the development of theories in developed countries follows the standard pattern of theory building, i.e., initial conceptual work is followed by empirical validation (using case studies and surveys approaches), and then mathematical model building is used to optimize various issues. As the area develops, literature reviews are carried out to consolidate the existing pool of knowledge. In contrast, the pattern of studies in developing economies is more inclined towards mathematical modelling. Most researchers in developing economies take conceptual and empirical studies from the example of a developed country, and they contextualize the study to develop mathematical/analytical models to optimize the performance of the system. In the presence of varying external

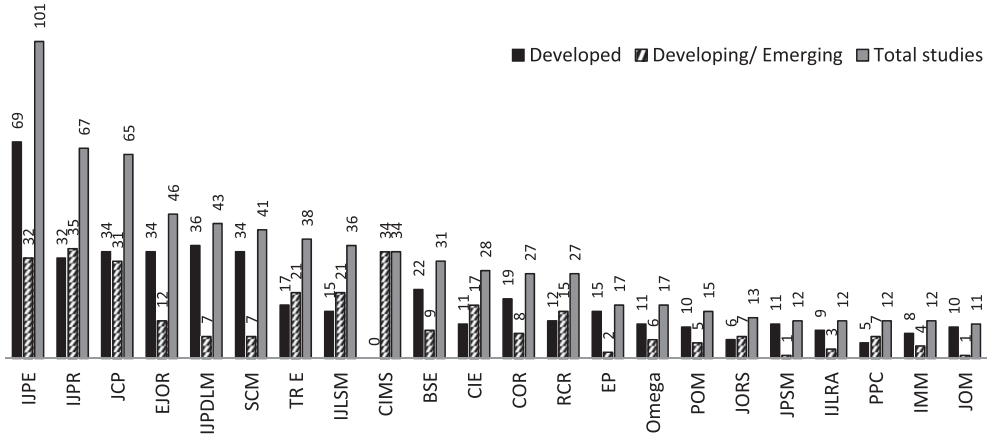

Fig. 5. 60% of publications on top 12% journal covering sustainability issues in SCM. (Note: The expansion of acronyms is mentioned in the first article of each journal in Reference section).

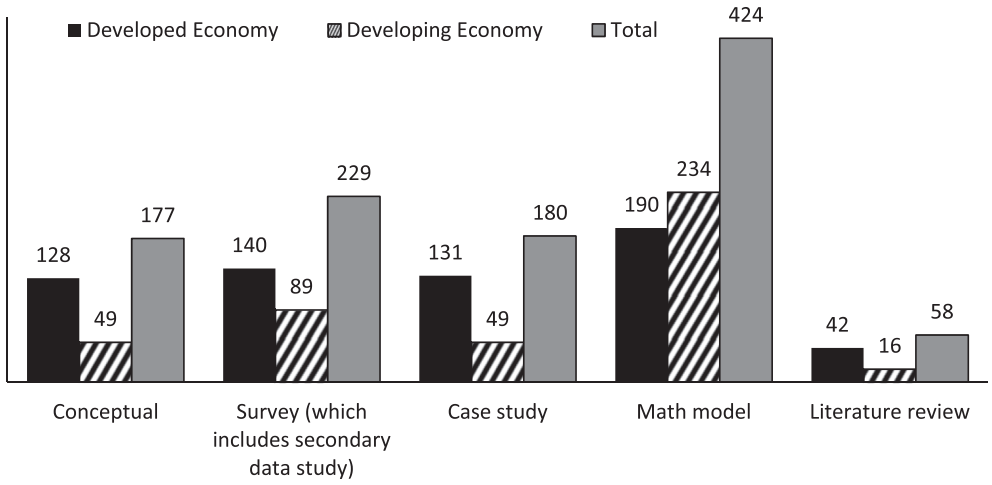

Fig. 6. Number of studies contributing to literature development in SCM sustainability.

environments, like regulations, market forces, and infrastructures in emerging economies, empirical studies should ideally first validate the conceptual model for a given context and then follow up with mathematical modelling to reach optimal solutions. Subsequently, literature reviews would appropriately identify and address the actual problems in developing countries.

The trend of higher mathematical modelling might be associated with a greater focus on economic aspects in emerging economies along with their poor regulatory compliance. The lack of significant empirical studies might also be due to environment and social dimensions in these economies because companies are not eager to share such information unless it is made mandatory by regulatory authorities. When government agencies or academic institutions establish good data collection standards, that will help promote research capabilities. Fig. 7 below gives the details of quantitative studies in SSCM literature during the period (Brandenburg et al., 2014).

The most popular methodologies used in the studies include MILP, Nonlinear modelling, and heuristics. 'Other' methodologies, which were applied sparsely, include experimental studies, economic models, Grey theory, strategic programming, and costing models. 'Simulation' consists of various software-based simulation techniques for decision making. Stochastic modelling consists of Value at risk and other mathematical models with stochastic parameters. Almost 75% of studies using MILP and Nonlinear modelling are based on issues relating to reverse logistics and closed loop supply chain. It can also be observed that the studies on issues relating to reverse logistics and closed loop supply chain are also high in developing countries, which might be another reason for the higher number of mathematical modelling based studies in the context of developing countries. Also, the studies in developing countries are more intended towards profit maximization, so the usage of optimization tools is more common. Since the focus on broad aspects of sustainability is also higher in developed countries, more complex methodologies are used in those cases.

4.3.1. SSCM specific studies

Both developing and developed countries have followed a similar pattern of the evolution of knowledge in SSCM domain (Fig. 8). The observation on exclusive SSCM literature development is slightly different in the developing economies, compared to the above findings. Along with conceptual and mathematical

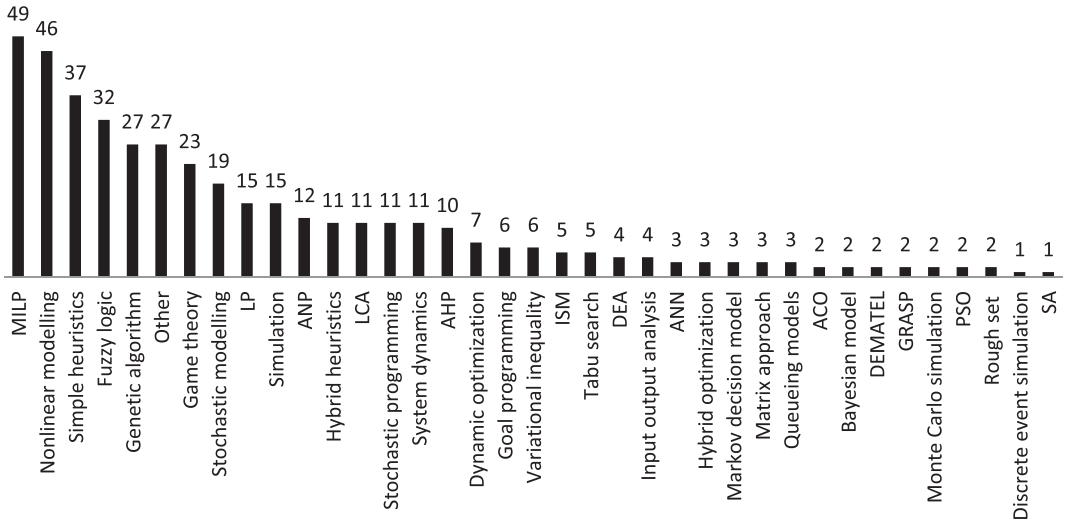

Fig. 7. Detailed classification of Quantitative models in SCM sustainability literature.

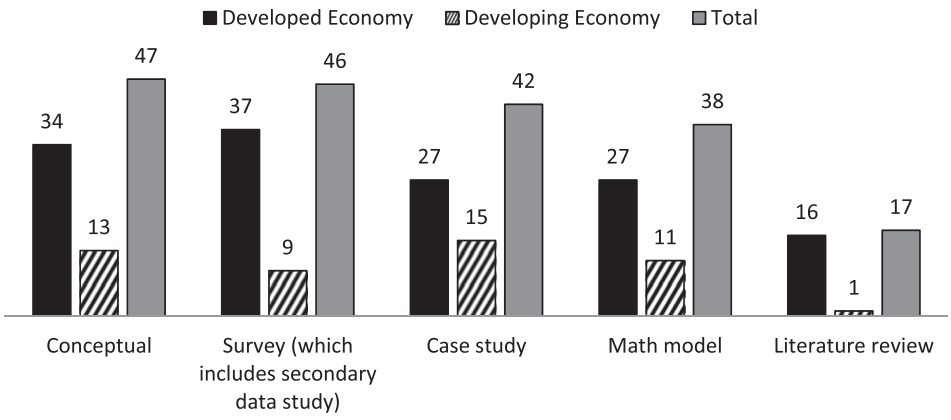

Fig. 8. Number of studies on various methodologies in SSCM in different economies.

modelling, considerable numbers of empirical studies in the field are present, followed by literature reviews.

This clearly indicates that emerging economies have started realizing the importance of empirical studies on their markets; stakeholders in emerging economies are increasingly sensitive to issues of inclusive growth regarding environmental, social, and economic concerns. As is evident from the sample, developed economies still dominate the growth of literature (with 74% of total studies) on SSCM domains. There is more potential for research to be done in strategic decision making (as observed in Fig. 11) using mathematical models in the context of emerging markets.

4.4. Industry-based classification of research

Another classification was performed to identify industries which were studied extensively and those for which fewer studies were done. Global Industrial Classification Standards (GICS standards) were followed to classify studies of various industries as done in Hassini et al. (2012). Of 1068 papers selected, 452 studies focused on specific industries or verified the proposals using data from specific industries. The remaining 616 papers were primarily generic in nature: 308 papers dealt with process efficiency in general manufacturing setups, and 308 papers focused on general aspects of sustainable/green supply chain. Fig. 9 clearly indicates the presence of the highest number of studies on the electrical and electronics industry (19.5%), followed by the agricultural and food industry (17.5%), the automobile industry (12.6%), and logistics (12.6%). Except for the electrical and electronics industry, in all other major industry segments, studies from developed economies are significantly higher than those from emerging economies. This may be attributed to the stricter regulatory norms and better compliance mechanism in developed economies. The higher number of studies in the electrical and electronic industry might be associated to the increased presence and dominance of manufacturing units in emerging markets (mainly Asia). An analysis of these emerging markets in the electrical and electronic industry reveals that 50% of the studies involve mathematical modelling. These observations coincide with the discussion in Section 4.3.

Multiple government agencies agree that the most polluting industries include the recycling of lead batteries, lead industry, mines, tanneries, industrial discharges, municipal industrial sites, artisanal industries, gold mining, petro chemicals, and dry cleaners (Blacksmith Institute, 2015). But very few studies address the above issues. Hence, in future studies, researchers in both economies should concentrate on these industries due to their long-term consequences on the environment and society (recall the BP Gulf of Mexico oil spill of 2010 and the Fukushima Daiichi nuclear power

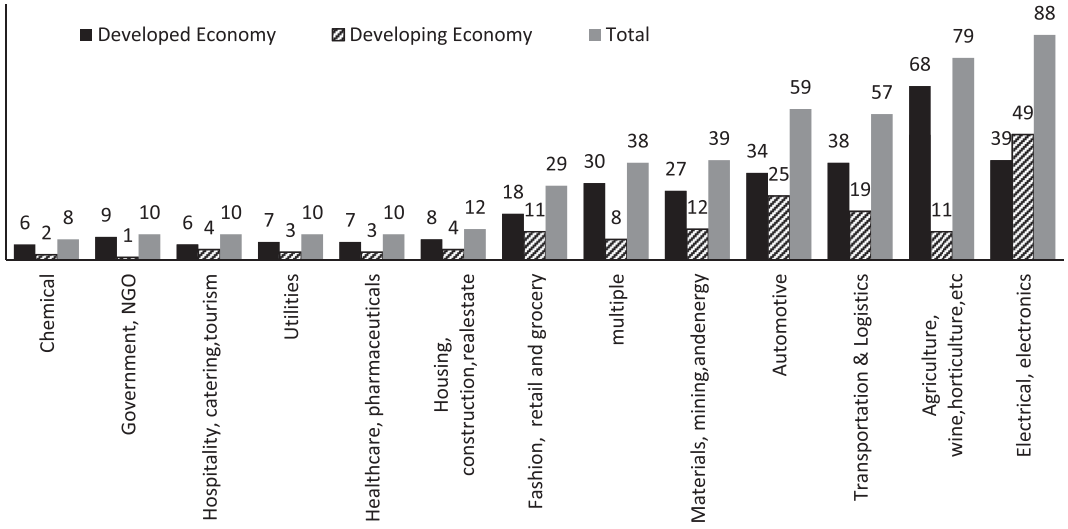

Fig. 9. Industry-based classification of studies in SCM sustainability literature.

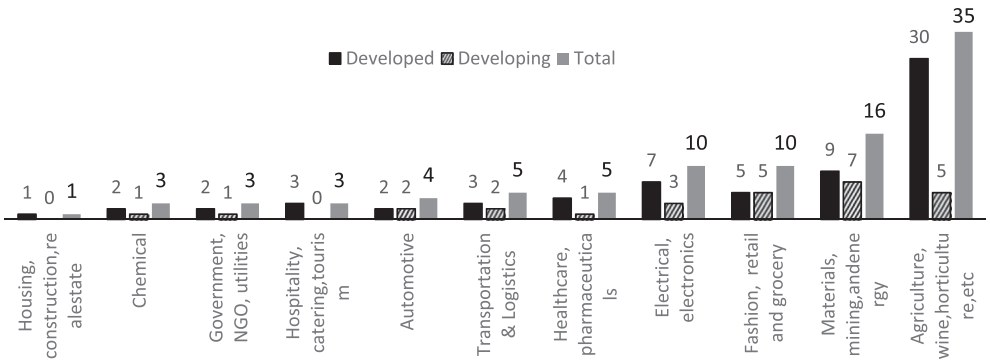

Fig. 10. Number of industry-specific studies in SSCM in different economies.

plant disaster from 2011).

4.4.1. SSCM specific studies

Considering the industry classification (as discussed above), we notice that around 50% of the literature on SSCM has specific industrial focus (Fig. 10). Studies on agriculture and food sectors are significantly higher compared to other industries. Most of these studies are on sustainable farming, fishing, and so forth, and they keep in mind all aspects of TBL. Although adverse effects on the environment and society occur more frequently from chemical industries (petro-chemicals, pharmaceuticals, dyes and pigments, organic chemicals, and agro-chemicals), there is a dearth of research in this industry. 'Endosulfan,' a chemical used in India and other emerging economies to increase agricultural productivity, has led to long-term adverse health issues on society as well as on the environment; its effects are expected to last for decades (The Hindu, 2015). Hence, future researchers could concentrate on finding out appropriate solutions/frameworks to improve the performance of these industries.

4.5. Issue-based classification of literature

We further explore the framework suggested in Fig. 1 by identifying the number of studies devoted to each of the TBL pillars and by determining those studies that combine two or more pillars to track the evolution of SSCM literature. Fig. 11 demonstrates that the

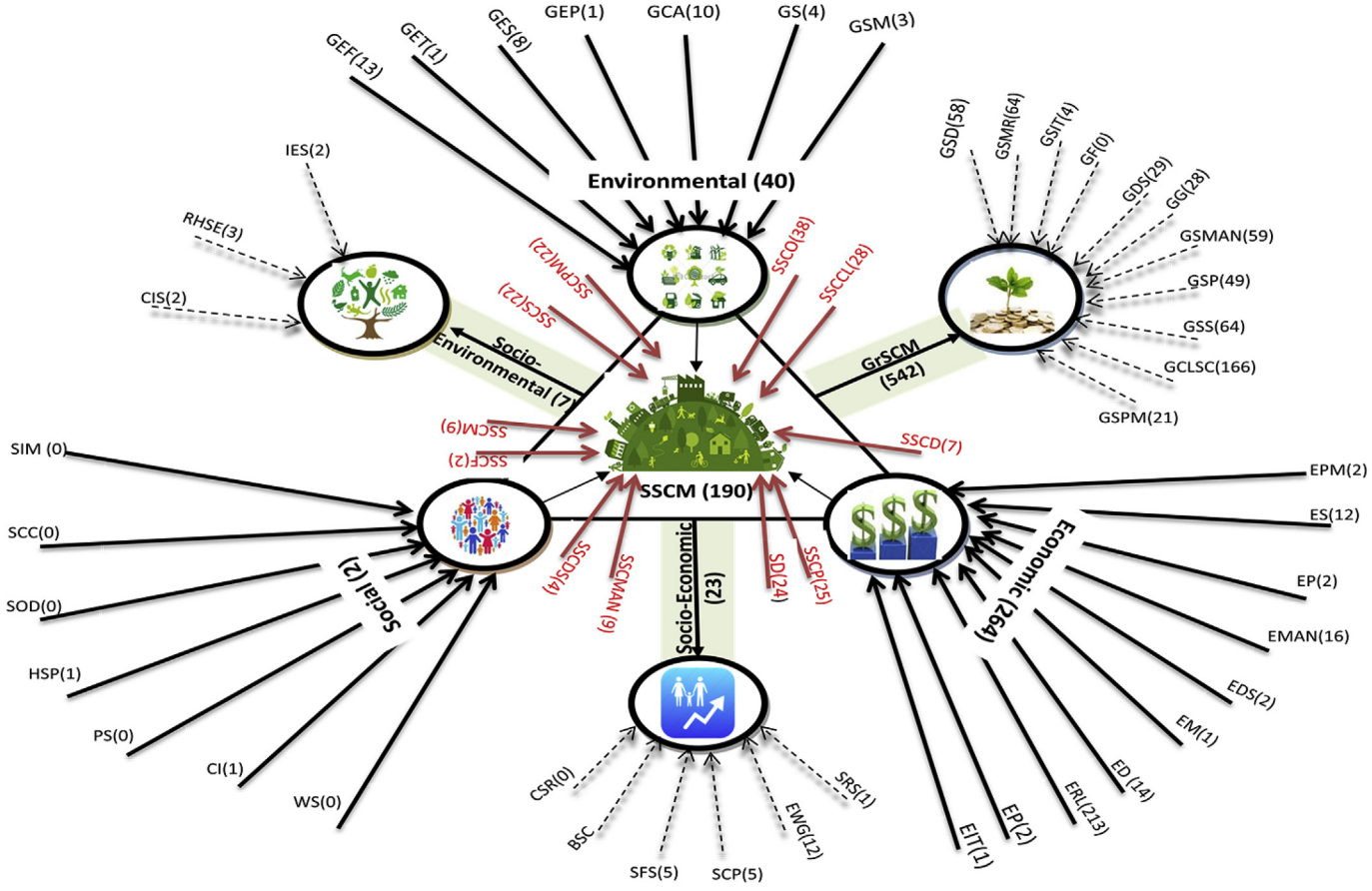

Fig. 11. Various issues addressed during evolution of SSCM.

greatest number of studies consider the economic dimension (1019), followed by environmental (779), and the least number pursue the social dimension (222). Fig. 11 includes the studies which fall into more than one dimension. 190 studies covered all TBL issues of SSCM, whereas GrSCM, and the Socio-Economic, and Socio-Environmental sub-divisions cover 542, 23, and 7 publications respectively. Carter and Rogers (2008) argues that the activities along the supply chain at the intersection of social, environmental, and economic (TBL) performance are considered to be the best strategy to attain sustainability. So, further research on SSCM should focus on sustainable supply chains rather than on only one dimension or sub-dimension. Fig. 11 also presents a detailed framework that represents the various factors and sub-dimensions studied in the TBL approach.

Issues as identified by Chen et al. (2012) on the basis of broad factors on sustainability/green in supply chains include marketing, design, purchasing/procurement, manufacturing, distribution/logistics, strategy, and closed loop supply chain. The additional issues of Information Technology, governance, and performance measurement are identified during the analysis of papers impacting the development of the literature on SSCM. Because reverse logistics is an integral part of CLSC, the present study considers it as a CLSC factor. Some of the issues and sub-issues identified in this review were identified in previous literature reviews on SSCM but were not classified comprehensively: Seuring (2013), Ashby et al. (2012), Carter and Liane Easton (2011), Gold et al. (2010), Brandenburg et al. (2014). 'Other' SSCM/GrSCM classification factors represented in the figure cover issues such as general literature reviews, practices in SSCM, and drivers of SSCM/GrSCM. Various issues identified in the Section and represented in Fig. 11 are in agreement with the issues highlighted by United Nations Environment Programme (UNEP, 2015).

Hence, the present study adds a significant value to existing literature by presenting an integrated framework that captures the factors studied on various TBL pillars and sub-divisions, all of which have led to the growth and evolution of SSCM. The Figure is depicted in three levels highlighting the factors influencing TBL (outer layer), sub-dimensions (middle layer), and SSCM (inner layer). The greatest research is on CLSC (with 166 studies), followed by other significant research areas: Green Strategy (64), Green Marketing (64), Green Distribution (58), and Green Manufacturing (59). This balanced approach indicates that researchers and practitioners have started realizing the importance of environmental protection for future generations.

The popularity of studies could also be the result of international agreements such as the Kyoto Protocol or the Copenhagen Climate change summit, which helped to establish the negative impact of poor environmental practices. In comparison to the GrSCM and Economic dimensions, only a negligible amount of research has been conducted on other areas affecting the evolution of SSCM. These other topics can be fruitful areas for future research in SSCM. Details of the literature covered under various factors, along with the abbreviations used, are presented in Table 4.

4.5.1. SSCM specific studies

With respect to the factors on which SSCM literature has been studied (Table 4), the spider diagram in Fig. 12 highlights that the focus of the study on SSCM has primarily been on sustainable strategy. Other studies observed explore a number of issues such as governance, information technology utilization, and performance measurement on sustainability. Studies conducted in Sustainable design, Sustainable distribution, Sustainable manufacturing, and Sustainable marketing are 4, 7, 9 and 9 respectively, which is fewer in number compared to studies conducted in GrSCM domain. This finding suggests that the field of SSCM is at a nascent level of strategic decision making. Similar observations are made with respect to the higher number of studies in developed economies compared to developing economies. It is expected that an increased emphasis on sustainable design practices can significantly benefit most of the other factors of SSCM to include sustainable purchasing, sustainable manufacturing, sustainable distribution, and CLSC.

5. Summary and conclusion

Currently there is a growing concern among strategists and decision makers across the world on the negative social and environmental effects of fast-paced industrial growth. Hence, the international community is stressing the adoption of sustainable production and consumption practices for both developed and emerging markets. The present study is an attempt to conduct a comprehensive literature review to understand the evolution of the body of knowledge on Sustainable Supply Chain Management. A three-stage literature selection process over 2000–2015 (July) was conducted to arrive at 1068 studies on economic, environmental, and social dimensions, as well as areas of mutual interaction (GrSCM, Socio-Economic, Socio-Environmental). Only 190 of those studies could be traced to literature pertaining to simultaneously addressing TBL issues of SSCM.

Fifty-nine literature reviews were observed on sustainability related topics using articles published prior to 2011. Trend analyses, overall literature reviews, detailed literature developments, and SSCM issues indicate that the majority of studies were published post-2011 but which have not been captured in any form. Hence, this review attempts to perform a comprehensive review of the evolution of Sustainability in SCM literature. The study also proposes for the first time a framework to capture all the factors expected to help in proper understanding of the evolution of SSCM. A comprehensive thematic analysis on collated literature (1068), as well as an exclusive SSCM focus (190), was performed to capture the development of the studies across periods under consideration, methodologies used in the study, industries on which the study were performed, and on a presentation of the factor/issues (via the proposed framework) that contributed to the evolution of Sustainability in Supply Chain Management (SSCM). All these studies were performed across various economies in the world. Our results show that studies in developed economies were far matured than those from emerging markets. It could also be seen that there was a significant surge in the quantity of studies after 2011, which may be attributed to the growing concern of researchers and practitioners to social and environmental dimensions. Businesses have long considered their economic prospects, but a clear lack of sensitivity to social issues is apparent. Top cited journals, such as IJPE, IJPR, and Journal of Cleaner Production were seen as suitable outlets for publications for this evolution phase; during the past four years, a number of special issues on sustainability have been published.

Future researchers can concentrate on studying every aspect of SSCM in emerging markets (where the majority of global populations reside). This focus will provide an impetus to improve the standard of living in developing nations and to reduce greenhouse emissions. Researchers should also concentrate on studying SSCM practices, issues, and models on the most polluting industries across the world. A pressing need is to include more industry specific studies, as the sustainability needs and performance of all the industries are not equivalent. From a supply chain perspective, for providing effective solutions, more industry-specific studies based on actual data are needed. As far as methodologies are concerned, it is observed that mathematical modelling based studies are done more in emerging economies. There is a need to establish synergy between empirical studies and mathematical modelling to provide effective solutions to sustainability issues,

Table 4
Detailed Classification of Issues on Sustainability in SCM (Note: Interested researchers may refer to Appendix A for the details of the research papers studied against the number provided in last column).

	Codes	Count	Papers
Economic factors			
Distribution	ED	14	536,913,776,44,470,282,246,192,387,489,324,881,181,528
Marketing	EM	1	85
Design	EDS	2	564,291
Production	EMAN	16	686,676,132,910,58,823,210,449,480,1005,935,705,51,924,900,663
Purchasing	EP	2	974,398
Strategy	ES	12	425,723,452,944,125,613,188,275,294,327,81,768
Reverse logistics	ERL	213	18,54,427,444,525,1042,1047,252,898,107,177,223,295,366,419,474,556,738,880,830,617, 919,863,916,926,615,41,87,70,580,1053,138,1054,1066,1060,91,957,476,537,835,798, 862,521,31,226,271,545,611,625,699,772,867,1032,227,778,37,312,334,165,992,808, 809,873,1041,424,893,704,927,694,922,965,1063,30,597,540,562,633,720,848,958,80,621, 1022,982,883,1038,211,901,86,422,750,814,884,90,357,583,718,27,997,7,270,1004,909, 553,793,386,265,743,854,773,481,554,429,157,175,479,523,629,687,912,779,463,600, 644,599,195,191,49,79,237,442,563,695,748,920,50,934,426,264,623,865,308,392,921, 273,894,828,598,235,76,853,925,1000,28,833,1076,702,455,914,585,632,643,653,98, 549,38,488,931,714,696,217,911,708,719,697,538,986,834,120,268,43,354,230,722, 789,1036,818,59,194,721,841,313,527,529,983,388,1002,933,567,681,288,938,546, 930,885,60,314,638,40,62,1050,142,595
Performance measure	EPM	2	67,539
IT	EIT	1	985
Governance	EG	1	189
Environmental factors			
Ecological Foot print	GEF	13	214,193,438,495,339,845,143,565,602,937,1046,666,450
Emission trading	GET	1	300
Environmentally sustainable practices	GES	8	242,302,82,121,522,325,763,461
Pollution management	GEP	1	413
Green consumer attitude	GCA	10	437,68,215,231,260,328,421,524,587,1077
Environmental strategy	GS	4	760,642,216,245
Green supplier management	GSM	3	301,447,971
Social factors			
Social impacts and measuring	SIM	0	NA
Standards and codes of conduct	SCC	0	NA
Social development	SOD	0	NA
Health and safety practices	HSP	1	518
Product safety	PS	0	NA
Community initiatives	CI	1	560
Work safety and labour health	WS	0	NA
GrSCM factors (Env and Economic)			
Green Distribution	GSD	58	190,256,360,397,555,558,581,967,10,635,902,64,604,781,183,203,251,290,412,464,1061,136, 200,1,331,205,568,732,961,907,766,734,1029,249,579,289,672,775,477,254,5, 174,535,960,917,102,769,994,688,796,534,736,727,895,932,973,78,634
Green Marketing	GSMR	64	3,259,662,826,929,513,145,148,176,238,435,451,475,492,493,505,519,836,816,751, 953,170,713,472,390,548,411,415,149,541,756,646,804,171,759,821,542,780,111,691, 869,147,168,601,467,733,770,817,820,206,783,827,689,764,825,749,590,674,155, 465,517,384,612,712]
Green Finance	GF	0	N/A
Green Design	GDS	29	570,514,179,32,36,105,153,257,281,715,329,219,497,526,1031,868,603,677,1064, 1057,1017,790,83,1028,381,161,311,172,333
Green Production	GSMAN	59	159,250,374,886,439,762,23,52,74,88,622,648,765,110,133,166,196,272,356,433, 443,494,500,531,584,1023,627,795,459,654,198,490,1008,896,20,1035,891,949, 248,864,619,618,1033,1024,393,173,984,716,996,1001,1058,428,1055,462, 135,690,543,915,892
Green Purchasing	GSP	49	274,510,607,652,707,655,496,25,236,572,266,875,53,482,221,417,507,511,547, 850,466,134,822,199,343,512,335,942,1051,928,1040,129,609,589,72,899,577, 1068,742,975,608,502,75,164,785,287,1062,1039,594
Green strategy	GSS	64	239,420,631,806,943,972,1015,263,318,385,243,586,940,966,26,641,180,747,744,805,48, 197,571,187,310,692,871,1074,657,1018,640,673,726,890,991,436,1043,647,1003,146, 340,1025,182,66,1013,1069,47,837,624,832,441,1073,606,1075,123,639,668,964,981,786, 855,882,741,406
Closed loop supply chain	GCLSC	166	4,69,169,228,332,336,347,352,530,1006,1021,1065,945,298,758,620,178,9,99,711,471,185, 202,225,240,255,348,454,457,485,532,533,861,710,810,717,874,241,296,995,501,941, 350,659,948,887,1052,364,661,244,258,100,978,224,849,794,1049,56,163,551,596,745, 16,35,139,150,701,735,777,807,377,45,11,509,6,550,359,458,755,879,423,576,839,279, 440,487,15,208,561,285,13,993,154,220,269,889,970,685,284,280,669,24,456,376,947, 908,212,233,703,378,842,1026,729,878,813,829,342,575,761,904,156,671,14,278,57,678, 651,851,515,682,491,151,593,709,484,262,782,649,557,367,906,499,840,22,812,990,469, 307,811,731,903,261,368,344,660,544,317,954,939,453,698,316,267,362,852,229
Green performance measurement	GSPM	21	379,569,373,1045,160,700,1034,588,656,365,73,103,383,605,396,746,286,857,1072, 434,802
Others	GG	28	299,1030,504,338,97,665,446,566,637,1037,923,2,1020,401,950,591,1070,740,936,309, 167,989,283,1067,693,1071,959,610
Green IT	GSIT	4	503,222,358,728

(*continued on next page*)

Table 4 (*continued*)

	Codes	Count	Papers
Socio-Economic issues			
Corporate social responsibility	CSR	0	NA
Socially responsible sourcing	SRS	1	1078
Economic welfare and growth	EWG	12	213,866,952,218,118,582,846,626,106,680,1014,46
Supporting community projects	SCP	5	209,962,897,34,431
Benefits sharing with affected communities	BSC	0	N/A
Stakeholder fare sharing	SFS	5	408,573,1016,39,799
Socio-Environmental factors			
Impact of corporate initiatives on Env and society	IES	2	326,395
Raw material used which poses health, safety or environmental hazards	RHSE	3	330,516, 730
Community led initiative for SD	CIS	2	399,860
SSCM (Env, Econ and Social factors)			
Sustainable Distribution	SSCD	7	115,201,253,349,355,684,724
Sustainable Marketing	SSCM	9	122,152,186,276,345,407,506,645,977
Sustainable Finance	SSCF	2	126,323
Sustainable Design	SSCDS	4	448,630,679,951
Sustainable Production	SSCMAN	9	89,96,204,305,337,341,351,382,706
Sustainable Purchasing	SSCP	25	63,320,486,42,61,65,71,95,119,141,321,346,371,402,404,405,409,410,468, 559,658,683,754,787,888
Sustainable Development	SD	24	969,414,667,956,104,303,1019,113,788,1048,430,831,33,108,131,109,664,757, 1009,1007,101,803,473,232
Sustainable strategy (including governance)	SSCS	22	29,93,114,127,128,144,363,389,400,483,508,520,616,675,771,791,918,979,980, 987,1056,1059
Sustainable performance measurement and management	SSCPM	22	21,112,130,137,158,277,292,293,319,391,416,460,478,574,797,815,843,844,963, 976,998,999
Sustainable CLSC	SSCCL	28	8,12,19,77,84,92,304,306,369,375,380,394,432,445,498,737,739,784,800,819,838,847, 870,877,946,1012,1027,1044
Others	SSCO	38	17,55,94,116,117,140,184,207,234,297,322,353,361,370,372,403,552,578,592,614, 628,636,650,670,725,752,753,767,774,792,801,856,858,872,955,988,1010,1011

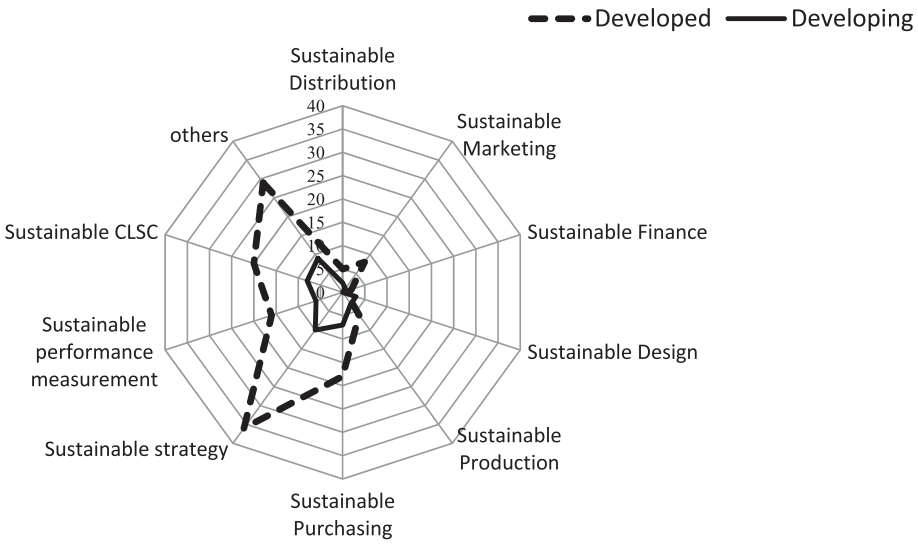

Fig. 12. Various issues in SSCM covered in selected journals.

which demands more primary data-based research for the emerging economies. From a theory development perspective, studies are mostly scattered and are far from reaching a theoretical consolidation. Most of the studies do not subscribe to any theories, and most are practice oriented.

Our proposed framework helps to understand the growth of sustainability-based studies in supply chain literature across various economies. It is observed that there is potential for future research in strategic issues, closed loop SC, and general sustainable development studies in SSCM. There is a need for growth in SSCM-based studies because they demand the involvement of more stakeholders to take into account all three dimensions of sustainability while they adopt business decisions along the supply chain. There was a call to increase studies on wider issues of SSCM, to increase cooperation among partnering companies and to include a wider set of performance objectives (Seuring and Müller, 2008). After a significant surge in articles post 2010, most studies are focusing on environmental aspects rather than on TBL. Although green/environmental issues dominate the research, scholarly attention to social issues has grown in recent years. There is a need for more studies to develop better scales for measuring the social impact of various supply chains. These efforts are expected to benefit the entire world community both in terms of economics and the environment, and may contribute to the

objective of raising the standard of living in these economies.

The major limitation of the existing study is that the literature were primarily collected from most of the top journals as per the ABDC/ABS ranking. Hence, the 'C' class, along with other non-ranked papers with low impact factors, have been excluded, which may have led to some loss of information.

Appendix A. Supplementary data

Supplementary data related to this article can be found at http://dx.doi.org/10.1016/j.jclepro.2017.05.026.

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