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Green Supply Chain Management: Theoretical Framework and Further Research Directions

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Abstract:

Purpose: Green or sustainable supply chain management (GSCM) has in recent years attracted much attention from academia and practitioners in all part of the world. In recent years, all humanity has experienced severe climate change which is widely attributed to human activity. Harmful emissions have made a major contribution to recent climate change which presents major challenges and threats to the entire human race in form of global warming, earthquakes, hurricanes, tsunami, and floods. The aim of this paper is to propose a conceptual GSCM framework grounded in Knowledge Based Theory (KBT) and outlined further research directions which can take existing GSCM literature to a next level.

Design/Methodology/Approach: In this paper we have used a systematic literature review to identify building blocks of the conceptual framework, which is the principal contribution of the present paper.

Findings: In this paper we have proposed a conceptual framework for green supply chain network which is firmly grounded in organizational theory. This framework can be further tested using data collected from multiple organizations using split-questionnaire.

Research implications: The current paper is an attempt to develop a conceptual framework which is grounded in KBT. The study helps to extent the prior works which lacks theory focused approach.

Key-Words: Green Supply Chain Management, Sustainable Supply Chain, Organizational Theories, Systematic Literature Review

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1. Introduction

Over the last decade, many companies around the world have been implementing Green Supply Chain Management (GSCM) as ways to enhance their competitive edge in the global market (Rao and Holt, 2005; Corbett and Klassen, 2006). There is growing evidence of empirical research supporting a direct relationship between the adoption of Green Supply Chain Management (GSCM) and improved firm performance (e.g. Rao and Holt, 2005; Zhu et al., 2005; Zhu and Sarkis, 2007; Zhu et al., 2008; Eltayeb et al., 2011; Lee et al., 2012; Dues et al., 2013; Gavronski et al., 2013; Dubey and Bag, 2013; Laosirihongthong et al., 2013; Yusuf et al., 2013; Schrettle et al., 2014; Mitra and Datta, 2014; Mohanty and Prakash, 2014a, 2014b; Luthra et al. 2015; Jayaram, and Avittathur, 2015; Malviya and Kant, 2015;Dubey et al. 2015b; Bhardwaj, 2016). Given the theoretical link that exists between competitive advantage and performance, it is perhaps not too surprising that it has been claimed that GSCM or SCSM practices can be used to generate competitive advantage (e.g. Porter and van der Linde, 1995; Gunasekaran and Spalanzani, 2012; Hassini et al., 2012; Giovanni, 2012; Gardas and Narkhede, 2013; Schrettle et al., 2014). Similarly, GSCM has, over the last decade, attracted enormous contributions from researchers around the world. The appeal of GSCM and SSCM is strong because of their growing stature in corporations and increasing recognition from producers and consumers; however, there is a wide gap in the existing literature and corporate policies related to GSCM and SSCM (Hu et al., 2010). The fact remains that there is no comprehensive theoretical model to underpin the claims advanced for GSCM. Without sound supporting theory, it will be difficult to move GSCM research to the next level. Therefore, the objective of our present research is to fill the existing void that still exists between GSCM practices, competitive advantage and organizational performance.

Theory building in GSCM has attracted the attention of researchers in the past (e.g. Zhu and Sarkis, 2004; Rao and Holt, 2005; Zhu and Sarkis, 2007; Zhu et al., 2012; Shi et al., 2012; Schrettle et al., 2014); however, in the early 2000s there were efforts to develop the theory in the context of or environmental practices including environmental purchasing and their impacts on organizational performance (e.g. Cordeiro and Sarkis, 1997; Sarkis, 1998; Zsidisin and Siferd, 2001; Carter and Jenning, 2002). Most of the models or theoretical frameworks were proposed at the macro level (i.e. institutional pressures – Zhu and Sarkis, 2007; Linton et al., 2007; Bjorklund, 2012; Kauppi, 2013) or at the micro level, including supplier relationship management (Vachon and Klassen, 2006; Bai and Sarkis, 2010; Testa and Iraldo, 2010; Hoof and Lyon, 2013); Lean Manufacturing (Farish, 2009; Franchetti et al., 2009; Deif, 2011; Dues et al., 2013); Total Quality Management (e.g. Pauli, 1997; Murovec et al., 2012; Prajogo et al., 2012; Pereira-Moliner et al., 2012; Gavronski et al., 2013); Leadership (Siaminwe et al., 2005; Stone, 2006; Brown and Stone, 2007; Berkel, 2007; Deif, 2011; Dues et al., 2013; Hoof and Lyon, 2013; Despeisse et al., 2012); and green technology (e.g. Sikdar and Howell, 1998; Zhang et al., 2013; Hoof and Lyon, 2013). However, despite these works at both macro and micro levels, there is nevertheless no comprehensive framework which has investigated the impacts of all these variables on organizational performance under the effect of controllable variables while taking into account environmental uncertainties (Chen and Paulraj, 2004) and product complexities (Jacobs, 2013).

Thus, in this paper we posit three key questions:

RQ1: What are the key constructs of GSCM practices?

RQ2: Can we propose a comprehensive framework for GSCM implementation?

RQ3: What are further research directions?

In an attempt to answer these three key questions, we have adopted a systematic literature review approach. In this way we will be able address the longstanding calls of previous researchers. To this end, the rest of paper is

organized as follows. In the following section we will discuss the evolution of GSCM practices, including definitions of GSCM based on scholarly works; dimensions of GSCM; theories of GSCM; and the impacts of GSCM practices on organizational performance. Section three will discuss the research methodology and will deliberate on the systematic literature review approach. Section four discusses generic research concerns with GSCM, and in section five, which concludes the paper, we will provide further research directions based on a synthesis of our findings.

2. Evolution of GSCM

The traditional supply chain was managed with the objectives of reducing cost and improving service with little concern with environmental dimensions (Simpson et al., 2007; Sarkis et al., 2011). However, over time, external pressures such as coercive pressure, peer pressure and mimetic pressure have forced companies to design supply chain networks which take into account environmental dimensions (Srivastava, 2007; Gavronski et al., 2008; Guide and Van Wassenhove, 2009; Gunasekaran and Spalanzani, 2012). In the last decade, the concept of closed loop supply chains has emerged, reflecting the profit recovery available from value added components, product reuse, and business opportunities in recycling (Guide and Van Wassenhove, 2009; Soleimani et al., 2014). Despite the environmental awareness which emerged in the USA in the 1960s and subsequently spread throughout the world (Sarkis, 2011; Nelson et al., 2013), countries like India and China have been late in responding to the environmental call; however, most firms in India have now integrated environmental dimensions into their corporate policies, although some have yet to implement these. GSCM practices were initially guided by a single objective, i.e. environmental performance. However, in recent years firms have realized that this single objective philosophy cannot provide sustainability. Thus, responding to calls from academics that have long been pending, firms have increasingly started to adoptive more comprehensive performance frameworks, such as the Triple Bottom Line (TBL) (e.g.Awaysheh

and Klassen, 2010; Paulraj and de Jong, 2011; Giminez et al., 2012; Giovanni, 2012; Hollos et al., 2012). In a similar approach, Carter and Rogers (2008) defined SSCM as a common region defined by three intersecting circles representing financial, social and environmental performance. Thus, we can conclude that the way in which, over the past two decades, SCM has evolved into SSCM and GSCM represents a journey, guided by institutional pressure and the vested interests of the firms, to place these concepts among the guiding philosophies of firms operating in a global environment today.

2.1 Definitions of GSCM

In this section, we have made an effort to define GSCM based on past scholarly works, limiting our analysis to those published in the last fifteen years. Table 1 presents some of the definitions presented in the literature.

Table1: Selected definitions of Green Supply Chain Management

Reference	Definition
Narasimhan and Carter (1998)	GSCM is a purchasing philosophy which is guided by two perspectives. One is reuse and the second is recycling of materials.
Godfrey (1998)	GSCM is a set of practices that helps firm to monitor environmental dimensions in a supply chain network and continuously improve supply chain performance.
Beamon (1999)	GSCM is defined as cooperative initiatives, taken by a central company among supply chain partners, to support the organization of eco management know-how in the central company and the development of clean manufacturing techniques.
Gilbert (2000)	GSCM is defined as an integration of environmental criteria with the traditional supply chain network by redesigning purchasing policies and involving suppliers in the entire procurement process.

Kogg (2003)	GSCM is defined as a set of policies that imbibe environmental concerns right from product design, procurement, production, distribution, to re-use or disposal of goods or services. This definition is an adapted version of Zsidisin and Sieferd (2001).
Sarkis (2003)	GSCM is defined as a combination of the activities of an environmental company and reverse logistics, and emphasized the latter's importance.
Vachon and Klassen (2006)	GSCM is defined as a strategy, which helps to minimize wastages in supply chain network.
Srivastava (2007)	GSCM is defined as a process of integrating environmental thinking into supply chain management, including product design, material sourcing and selection, manufacturing processes, delivery of the final product to consumers, and end-of-life management of the product after its useful life.
Carter and Rogers (2008)	GSCM is defined as an integration of environmental dimensions with the traditional supply chain network.
Seuring and Müller's (2008)	GSCM is defined as the management of material, information, and capital flows as well as cooperation among companies along the supply chain while taking into account goals from all three dimensions of sustainable development, i.e. economic, environmental, and social, which are derived from customer and stakeholder requirements.
Guide and Van Wassenhove (2009)	GSCM is about recovering values from reuse and recycling. These objectives result in the formation of a closed loop supply chain network design.
Ali and Govindan (2011)	GSCM is defined as an organizational philosophy to reduce environmental risks.
Gunasekaran and Spalanzani (2012)	GSCM is an organizational philosophy which provides competitive edge to an organization.
Schrettle et al. (2014)	GSCM is a tool which helps to position company from a strategic perspective.

It is quite clear from the above definitions that GSCM is an organizational philosophy which integrates environmental dimensions with the traditional supply chain network, which includes procurement, logistics, manufacturing, distribution and disposal or reuse/recycling. Vonderembse et al. (2006) suggested that different supply chain strategies are pursued in different product life cycle phases. Further, there are four types of product, i.e. standard, innovative, hybrid and green. In the case of green products, a hybrid supply chain design with an environmental focus is the most appropriate strategy.

Successful implementation of GSCM and its integration with corporate strategy requires leadership, building organizational culture, supply chain collaboration (i.e. involving suppliers, transporters and customers) and regulatory norms. In other words, it can be termed as a strategy to improve sustainability and improve organizational performance. According to Srivastava (2007) and Lu et al. (2007), GSCM has evolved as a result of natural resource depletion and environmental degradation. Over the last two decades, pollution has exceeded safe levels, threatening dire consequences. Hence on the basis of extensive review of existing GSCM definitions we have proposed our operational definition as, "…. *The green supply chain management (GSCM) is an organization philosophy which can provide competitive advantage to the organization in terms of high product quality, high service quality, minimum wastes, zero pollution, better image, and high return on investment…*".

3. Research methodology

In an attempt to answer the research question RQ2 and to further help us to address question RQ3, we use a literature review approach. Past researchers have used a literature review to identify the constructs within a particular research framework and identify relevant theories (e.g. Srivastava, 2007;

Baines et al., 2012; Gunasekaran and Spalanzani, 2012; Muduli and Barve, 2013; Gaussin et al., 2013).

Our study aims to develop a theoretical framework that will contribute to existing theories of GSCM based on a survey of extant literature and grey literature, and further to identify future research directions. We have found that older review-based research did not adopt the systematic literature review methodology. We observed in our review that systematic literature review (SLR) is a trend that researchers have adopted in more recent papers (e.g. Pittaway et al., 2004; Van Aken, 2005; Lightfoot et al., 2013) in order to synthesize and organize research findings from multiple studies in an orderly and transparent manner. In our research process, we have adhered to the principles that are integral to SLR, i.e. that it must be transparent, replicable and rational. The review process undertaken by us is presented in Figure 1, adapted from Lightfoot et al. (2013). We have systematically identified scholarly works from databases like Science Direct, Compendex, Ebsco, Emerald and Scopus, and the justification for this selection is provided briefly below.

Science Direct is one of the leading databases in terms of number of journals concerned with supply chain management and the related area of operations management. Journals include *International Journal of Production Economics, Journal of Cleaner Production, Omega, Journal of Operations Management, Transportation Research (Parts A, B, C and D), European Journal of Operational Research, Journal of Purchasing and Supply Management* and *Resources, Conservations and Recycling*. Emerald is a popular database that publishes reputable journals in the field of operations and supply chain management including *International Journal of Operations and Production Management, Supply Chain Management: An International Journal, International Journal of Physical Distribution and Logistics Management and International Journal of Logistics Management*. Beside these journals, we looked at other reputable journals which are highly reputable in their fields, including *MIT Sloan Review, Journal of Supply Chain Management, Transportation Journal,*

Journal of Business Logistics, International Journal of Production Research, Production, Planning and Control, International Journal of Logistics Research and Applications, International Journal of Procurement Management, and *International Journal of Services and Operations Management* and other journals, depending upon the suitability of the articles. Our search was based on broad-based terms and strings associated with the field of green supply chain, GSCM practices and theories of GSCM, green manufacturing, green procurement, green logistics and carbon footprints. In order to assure ourselves that we were not missing any relevant work(s), we explored the same search strings further in Google Scholar. This process identified 323 apparently relevant articles as a basis for further analysis. To narrow our analysis, we read the abstracts and key words of the initial selection to further limit ourselves to 248 relevant articles. Once the inclusion and exclusion choices had been made, the cross-checking of authors and references and, where possible, consultation with scientific communities producing interim/unpublished relevant work (grey literature) further informed and increased the pool to 262 published principal articles. All articles were considered to be representative of the current body of knowledge associated with GSCM, GSCM practices and theories of GSCM.

We have characterised the various stages of the systematic review as follows:

Identification of review

We have identified our areas based on our research questions, following which we were able to identify our journals and grey literature.

Electronic search in databases

This includes popular databases in the field of operations management and related fields such as logistics management, supply chain management, transportation, and environmental management. The databases discussed above contain a rich and diversified repository of reputable journal articles. However, it must also be acknowledged that these databases have their own limitations. First, the databases do not include technical reports. Second, there are many journals which are not indexed. In such a situation, sources in the

open access domain, such as Google scholar, where all grey literature is available, provide great support.

Title and abstract review

This involves simply reading titles and related abstracts to draw insights into the suitability of the articles. Therefore, researchers can rapidly eliminate those articles which are not relevant to the research. In this way, we identified 323 papers relevant to our research questions.

Apply inclusion and exclusion principles

This helped us to further concentrate on the 248 articles that we have included in our present research. This is done by including reference checks and grey literatures.

Create data extraction excel files

This is a structured documentation process which has helped to define GSCM and its related practices, recent trends in GSCM and sustainability areas, research gaps, and further scope for research.

Descriptive and thematic analyses

The thematic analysis involved a detailed review of the content of each research article. To do this we created a coding frame to catalogue the textual content and brief summaries of each paper.

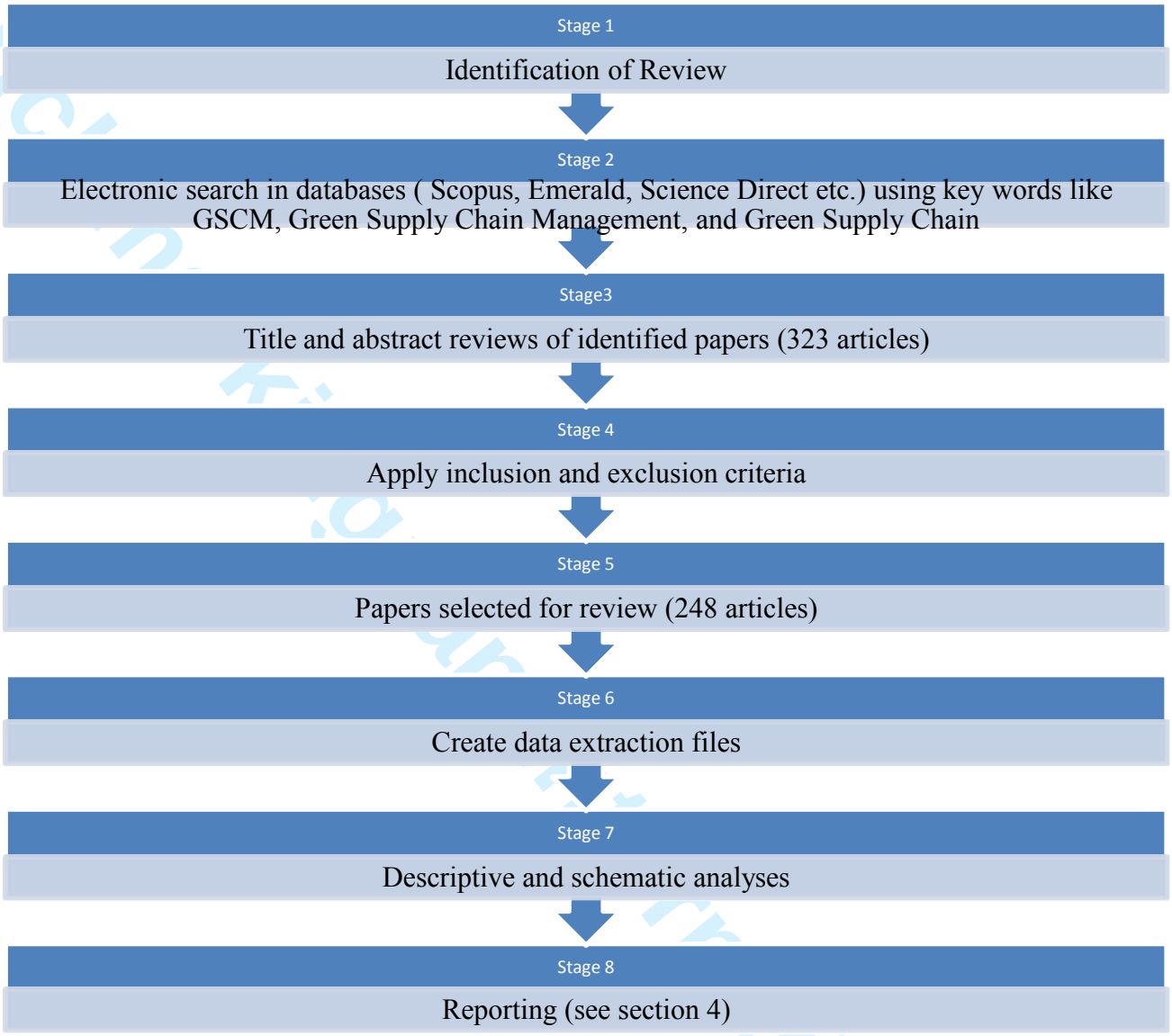

Figure 1: Review Procedure

(*Adapted from Malviya and Kant, 2015 and further refined as per our study needs***)**

We have classified current literature into various categories like GSCM practices, critical success factors (CSFs) along the supply chain network, and theories of GSCM. This is our attempt to answer research question RQ1 – which we posited in the introduction section – which will be further synthesized to build a conceptual framework of GSCM which will provide an answer to our research question RQ3. This is the main contribution of our

present paper. Finally, as a part of our research contribution, we present the performance measures and metrics.

4. Classification scheme for the literature on GSCM

We have classified our literature into three sections. In the first section we have presented bibliometrics study of the GSCM articles on the basis of year-wise, country-wise and study-wise. Second we have attempted to classify literature on the basis of organizational theories following Ketchen and Hult (2007) and Sarkis et al. (2011) suggestions. Third, we have discussed generic concerns related to GSCM literature. Fourth, we have classified literature on the basis of building blocks of GSCM framework and finally we have presented our GSCM framework and its performance measures.

4.1 Bibliometrics Study of GSCM articles

Malviya and Kant (2015) have made an attempt to classify the GSCM literature on the basis of year-wise publications, country-wise, affiliations-wise, publishing house-wise, research-design wise and techniques-wise. Hence we have only restricted our attempt to year-wise, country-wise and research methods to avoid any duplication.

4.1.1 GSCM studies according to the year of the articles published

We have used Scopus database to classify the GSCM literature following QS World University Rankings (2015) suggestions. The Table 2, which indicates that number of articles, published surrounding GSCM in Scopus indexed Journals have increased exponentially from year 1990 to year 2014. However it is noted that number of article published in the year 2015 is slightly lower than the year 2014 which is due to shift in the focus of the authors from GSCM to SSCM field which is considered to be more holistic than GSCM field. However our current focus is on GSCM related study, hence we have only presented detailed longitudinal analysis of articles published from year 1990 till year 2016 (April).

Table 2: Longitudinal analysis of GSCM literature

Year	Number of articles published
2016	62*
2015	211
2014	251
2013	216
2012	156
2011	162
2010	150
2009	93
2008	70
2007	39
2006	31
2005	22
2004	13
2003	10
2002	11
2001	6
2000	4
1999	2
1998	4
1997	1
1996	3
1995	2
1994	0
1993	0
1992	1
1991	0
1990	1

(Source: Date of access 14th April, 2016 using Scopus database)

(* represent that the articles included till April)

The Table 2 clearly reflects increasing trends towards GSCM related research which has gained significant attentions among researchers from year 2008. Hence the field is still in nascent stage and requires significant attentions to take the current research to next level.

4.1.2 GSCM studies classification on the basis country-wise

In this study we attempted to understand contribution towards GSCM literature on the basis of country to create awareness among scholars to understand how the researchers affiliated to the Universities or institutions located in these countries or territories. We have used Scopus database followed by "green supply chain management" key word to identify literature. We have already submitted that Scopus database may not cover all the literature. The majority of the researchers agree that Scopus database includes that literature published after several rounds of revision. In the Table 3 we have dropped those countries whose contribution is less than 2 so that we can focus on those countries whose authors have contributed significantly in Scopus indexed Journals. The Table 3 clearly indicates that China researchers have made significant contributions towards the emerging field. After China, the US researchers have made significant contributions followed United Kingdom, Taiwan and India. Hence there is tremendous opportunity in the field of GSCM as more than 90 percent of the countries researchers have not yet explored the opportunities in the field.

Table 3: Countries wise distribution of the GSCM articles

Countries	Number of articles published
China	343
United States	47
Hong Kong (Special Administrative Region)	16
United Kingdom	10
Taiwan	9
India	7
Denmark	6

Australia	2

(Source: Date of access 14th April, 2016 using Scopus database)

The number of the articles published may be higher as most of the articles which are published are yet to be reflected. In such case Brazil, Finland, Canada, France and other countries may be included. The countries like Brazil, France, Russia and Germany have published their articles in their language. Hence due to lack of awareness towards English Journals, the most of the published articles may not be included in leading indexing databases. Thus the Table 3 may only represent partial reality.

4.1.3 Research Methods

We have analyzed each article of GSCM and we have noted down the research methods. The major research articles focus on the methods like survey, mathematical modelling, simulation, case studies and conceptual models. We have classified 248 papers on the basis of research methods are shown in Table 4.

Table 4: Research Methods applied for GSCM

	Number of articles	%
Survey	112	45.16
Mathematical Modelling	67	27.02
Conceptual Model	21	8.47
Qualitative Methods	48	19.35
Total	248	100.00

However we can see that survey based articles represent 45.16% of the 248 articles which represent significant contributions. However most of the survey based articles lack enough guiding theories and secondly most of the articles lack enough scientific rigors. Hence in recent years some of the Journals like *Journal of Operations Management*, *Journal of Supply Chain Management*, *Journal of Business Logistics*, *International Journal of Production Economics*,

International Journal of Logistics Management and *International Journal of Operations and Production Management* have clearly outlined in their editorial note that those articles which does not meet scientific rigors may be desk rejected. Finally we have noted that articles using triangulation approach are limited and hence this may be one of the areas which require significant attentions (see Fawcett et al. 2014).

4.2 GSCM theories

Currently, there exists a gap in the available literature in the area of GSCM studies relating to providing theoretical support to explain the existence and the boundaries of green supply chain management. A few authors (such as Rosen et al., 2002; Maignan and McAlistar, 2003; Zhu and Sarkis, 2004; Rao and Holt, 2005; Vachon and Klassen, 2006; Zhu and Sarkis, 2007; Carter and Rogers, 2008; Delmas and Montiel, 2009; Sarkis et al., 2011; Zhu et al., 2012; Shi et al., 2012; Schrettle et al., 2014) have tried make use of organizational theories to provide theoretical foundations for different areas related to the supply chain. These theories include:

- Complexity theory (CT)
- Resource-based view (RBV)
- Transaction cost analysis (TCA)
- Knowledge based view (KBV)
- Strategic choice theory (SCT)
- Agency theory (AT)
- Institutional theory (InT)
- Systems theory (ST)
- Network perspective (NP)
- Ecological modernization theory (EMT)
- Information theory (IT)
- Resource dependent theory (RDT)
- Social network theory (SNT).

We have categorized GSCM literature into 13 theories, as shown in Table 5.

Table 5: GSCM theories

Theory	References
Complexity Theory (CT)	Vachon and Klassen (2006); Choi and Krause (2006); Matos and Hall (2007); Guide and Van Wassenhove (2009); Sarkis et al., 2011; Gunasekaran et al., 2014; Govindan et al., 2014.
Resource Based View (RBV)	Rao and Holt, 2005; Zhu and Sarkis, 2006; Vachon and Klassen, 2007; Gold et al., 2010; Sarkis et al., 2010; Sarkis et al., 2011; Shi et al., 2012.
Transaction Cost Analysis (TCA)	Rosen et al., 2002; Sheu et al., 2005; Yang et al., 2010; Delmas and Montiel, 2009; Chen et al., 2012; Barari et al., 2012; Chaabane et al., 2012; Caniels et al., 2013.
Knowledge Based View (KBV)	Sheu and Chen, 2012; Schrettle et al., 2014.
Strategic Choice Theory (SCT)	Siaminwe et al., 2005; Stone 2006; Brown and Stone 2007; Berkel 2007; Deif 2011; Despeisse et al., 2012; Law and Gunasekaran, 2012;Singh et al.,2012; Dues et al., 2013; Hoof and Lyon 2013.
Agency Theory (AT)	Bierma and Waterstraat 1999; Vachon and Klassen 2006; Hsu and Hu 2009; Bai and Sarkis 2010; Ku et al., 2010; Testa and Iraldo 2010; Hoof and Lyon 2013.
Institutional Theory (InT)	Corral, 2003; Zhu et al., 2005; Tsoulfas and Pappis 2006; Sarkis et al., 2011; Singh et al., 2012; Zhu et al., 2013; Dubey and Bag, 2013.
Systems Theory(ST)	Holt and Ghobadian (2009)
Network Perspective (NP)	Van Bommel (2011)
Ecological Modernization Theory (EMT)	Kassolis, 2007; Zhu et al., 2010; Park et al., 2010; Sarkis et al., 2011.
Information Theory (IT)	Jiang and Bansal, 2001; Erlandsson and Tillman, 2009; Sarkis et al., 2011.
Resource Dependent Theory (RDT)	Zhu and Sarkis, 2004; Zhu et al., 2005; Carter and Rogers, 2008; Shang et al., 2010.
Social Network Theory (SNT)	Maignan and McAlister, 2003; Seyfang, 2006; Mollenkopf et al., 2010; Wu et al., 2012.

The contributions to the various theories of GSCM over the past decade reflect the growing popularity of the subject. However, there are still very few contributions to Knowledge Based View Theory and Systems Theory. In addition, although GSCM literature has evolved in the past decade, nevertheless, with few exceptions, most of the literature lacks supporting theory. Further, most of the literature contains overlapping theories which reflect a lack of understanding among most of the researchers regarding GSCM theories. On the other hand, SCM literature has demonstrated better understanding in terms of theory. Hence, it can be concluded that GSCM and SSCM areas are relatively new disciplines, and over 70 per cent of the contributions have come from onely 15 per cent of first authors, which reflects the urgent need for contributions from other researchers with a strong understanding of theory and methodology.

4.3 Generic research concerns with GSCM

On the basis of our review of the current literature, we have identified a number of research concerns, which will help us to propose our conceptual framework. These are discussed below.

4.3.1 Lack of proper understanding of GSCM and related research

We have reviewed articles related to GSCM, and we have found that there are overlaps between these two concepts. However, most of the recent literature focuses on SSCM. In this section we have made an attempt to resolve debates related to GSCM.

We have already discussed in detail GSCM and its definitions based on scholarly works, and we have identified some of the extant literature that explains SSCM more comprehensively. SSCM embraces not only environmental performance measures along with the profit/loss statement; it also includes social performance measures (e.g. Linton et al., 2007; Carter and Rogers, 2008).

However, in the past the GSCM literature has focused primarily on the impacts of GSCM practices on environmental and financial performance. However, except for a few notable contributions (e.g. Carter and Easton, 2011; Ameer and Otham, 2012; Zailani et al., 2012; Hoejmose and Adrien-Kirby, 2012; Wang and Sarkis, 2013), there is a dearth of literature which has reflected on social dimensions.

It can be concluded that the social dimension area needs to be further explored. However, at present we can hardly differentiate between GSCM and SSCM practices. SSCM practices and their impact on social performance need to be further explored, which will further strengthen the claims of past scholars.

This limitation could be attributed to methodology issues. In the past, major empirical research has almost exclusively employed perceptual performance measures (with the notable exception of Wang and Sarkis, 2013). Such perceptual performance measures cannot provide a comprehensive picture of the situation. Hence, it has been suggested that financial data may be used in addition. In recent years researchers have expressed their concerns regarding the availability of financial data to validate a theoretical framework. In addition, researchers have in the past collected data in a single time period. Consequently, causality cannot be established without longitudinal data.

4.3.2 Decoding the missing link in GSCM theories

We have classified the literature into thirteen GSCM theories (see Table 2), through which we have attempted to extend the recent notable contribution of Sarkis et al. (2011), in which the authors classified the literature into nine organizational theories.

We can conclude from Table 5 that there are valuable contributions to Institutional Theory (InT), Resource Based Theory (RBT) and Transaction Cost Analysis theory (TCA); however, there are few contributions which have made any significant contribution to Knowledge Based Theory (KBT), Systems Theory

(ST) or Network Perspective theory (NP). Before we proceed further, it is useful to review our understanding of RBT, ST and NP.

KBT: According to KBT, the knowledge within the firm is regarded as its most strategically significant resource, providing competitive advantage for any firm. There is an argument that knowledge is something that is socially complex and difficult for competitors to imitate (Grant, 1996). KBT is an extension of RBT theory proposed by a number of authors (Wernerfelt, 1984; Barney, 1991; Conner, 1991). Similarly, the Green Intellectual Capital (GIC) of a firm comprises the sum of all its green knowledge (Claver-Cortes, 2007). Chen (2008) defined GIC as an inventory of intangible assets, knowledge, capabilities, relationships etc. concerning environmental protection. GIC has further been classified into human capital, green structural capital and green relational capital (e.g. Lopez-Gamero et al., 2010).

However, we have not come across any framework which has explored the knowledge dimensions of the firm and their impacts on organizational performance. Consequently, we can conclude that knowledge is the missing link in the present GSCM literature, which creates a platform for future research directions.

ST:Systems theory (ST) includes components like input (I), output (O), process (P), environment (E), agent (A), mechanism (M) and function (Chandra and Tumanyan, 2005). Holt and Ghobadian (2009) argued in one of their articles that GSCM research is in an embryonic phase and major contributions are required either towards the upstream end, i.e. focusing more towards green purchasing, or the downstream end, i.e. focusing more towards physical distribution. However, except in a few cases, most of the research on GSCM lacks a holistic view.

Holt and Ghobadian (2009) have tried to contribute to Systems Theory (ST) by supplying the missing link in the GSCM literature. However, excepting this single piece of work, there are hardly any notable contributions to the field of Systems Theory. This gap can further be explored in future research.

4.3.3 Supply chain complexity and product complexity

In the past, supply chain complexity has received widespread attention from researchers (Choi et al., 2001; Choi and Krause, 2006; Bozarth et al., 2009; Jacobs, 2013). Previously, supply chain complexity has been treated as a multi-dimensional construct (Choi and Krause, 2006; Closs et al., 2008; Bozarth et al., 2009; Closs et al., 2010; Jacobs and Swink, 2011). Extending previous research (e.g. Vachon and Klassen, 2002; Bozarth et al., 2009), we view supply chain complexity as it relates to the GSCM network, which is the missing link in current GSCM literature.

Second, we further consider product complexity, which stems from the customization, intricacy and variety of the firm's products (Schoenherr et al., 2010). Past research has shown a negative impact of product complexity on supply chain performance (e.g. Fisher et al., 1999; Krishnan and Gupta, 2001; Ramdas and Sawhney, 2001; Salvador et al., 2002; Hu et al., 2008). However, it has also been linked to sales growth (Lancaster, 1979; Kekre and Srinivasan, 1990; Quelch and Kenny, 1994), implying a trade-off for managers between sales growth through added product complexity and enhanced operational efficiency through product rationalization (Salvador et al., 2002). Some researchers have similarly suggested that product complexity may not result in negative performance effects (Bozarth et al., 2009; Blome et al., 2013). To the best of our knowledge, no studies have been conducted on the impact of product complexity on the green supply chain network.

4.3.4 Methodological issues

In recent years there has been growing evidence of the use of graph theory. Graph theory matrix application techniques have been used extensively to resolve inherent complexities among variables of GSCM, where there are limitations in the use of multivariate statistics (e.g. Luthra et al., 2011; Mangla et al., 2013; Mathiyazhagan et al., 2013; Muduli et al., 2013; Jabbour et al., 2013) or the use of multiple criteria decision making techniques (e.g. Wang et al., 2012; Govindan et al., 2014; Brandenburg et al., 2014). However, there is a

dearth of articles which have have integrated two diverse methodologies, e.g. graph theory and statistical techniques, to create reinforcement.

4.4 Conceptual Framework and Research Propositions

The foundation of our theoretical framework comprises of two elements: systems theory and the influence of knowledge based view theory on GSCM network (see Figure 1). During last one decade the the knowledge based theory(KBT) in recent years (e.g. Sheu and Chen, 2012; Schrettle et al., 2014) has attracted attention in context to GSCM field. We argue that systems theory approach with integration with knowledge based view theory can provide a better insight which systems theory or knowledge based view theory in isolation cannot provide. In this case green intellectual capital (GIC) of any organization can certainly provide an effective outcome. However, we cannot exclude the possibility of others factors which includes environmental uncertainty, product complexity and confounding variables (i.e. environmental uncertainty, organizational size, etc.) may influence our proposed framework, a possibility that will be considered in our proposed conceptual framework. The Conceptual framework is a precursor to hypothesis generation. The some of the features that includes are identification of relevant variables, discussions of relationships among variables, indications of nature and direction of relationship and development of a schematic diagram of the framework. We have followed some of the assumptions for building conceptual framework that are necessary for evolving hypotheses.

- The variables which are outlined are relevant to study and labeled in the discussions;
- The discussions has identified the nature of the linkage among the variables;
- We have theorized the nature and relationship among variables based on existing GSCM theories based on findings from extant literature;

- We have provided clear explanations and literature support, to justify the nature of linkage;
- A schematic diagram of the conceptual framework, which we have presented so that one can clearly visualize the theorized relationships.

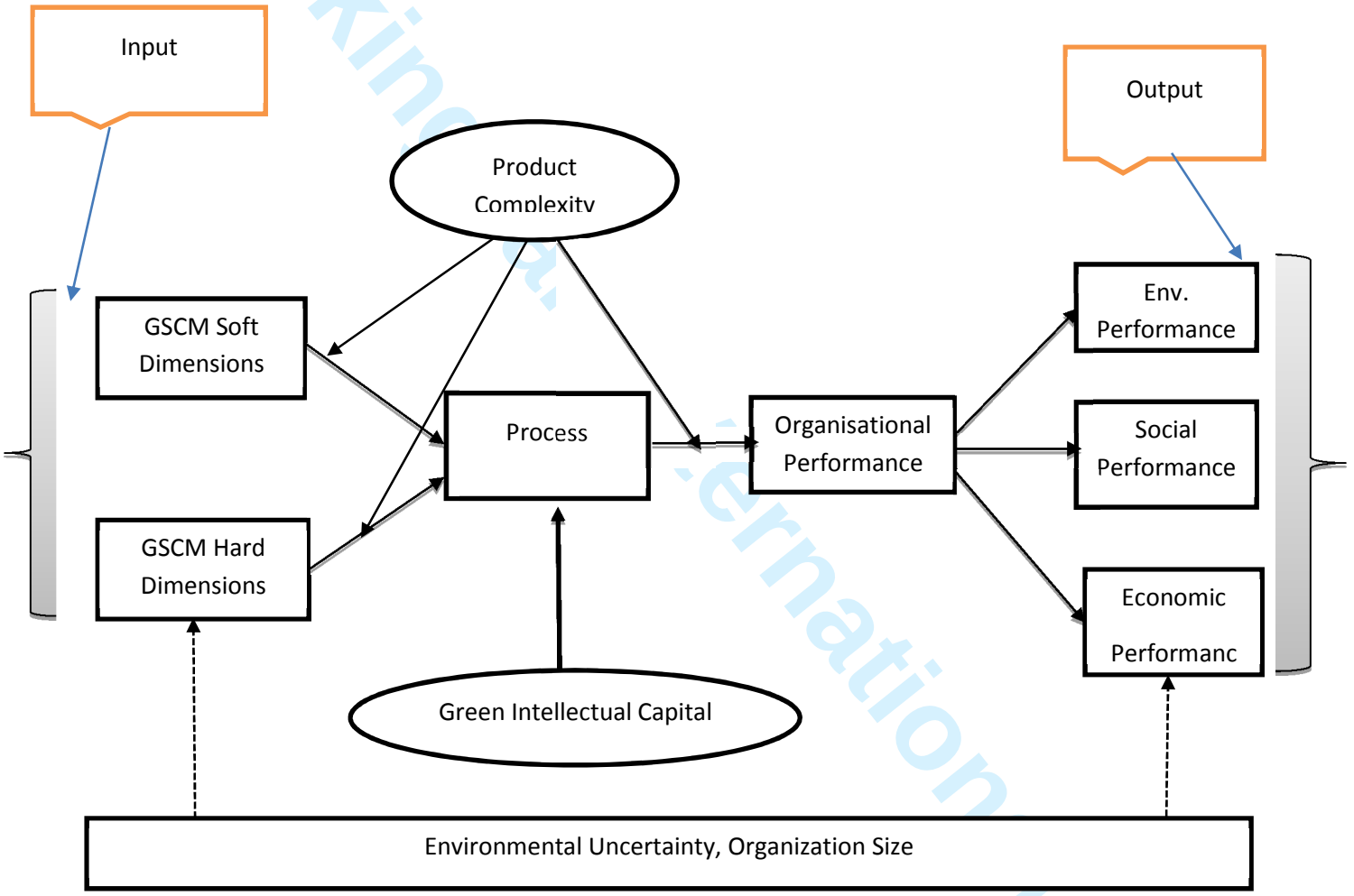

Figure 1: Conceptual Framework

In this section we have made an attempt to classify our literature based on building blocks of our conceptual framework for GSCM as shown in Figure 2. We have adopted system components approach to define our conceptual framework for GSCM (Chandra and Tunmanyan, 2005; Holt and Ghobadian, 2009).

The system components are:

- Input;
- Process;
- Output;
- Environment;
- Function

4.4.1 Input

It refers to GSCM CSFs, which have classified into two categories:

- GSCM soft dimensions;
- GSCM hard dimensions;

GSCM soft dimensions

It refers to human resource related dimensions. From in depth exhaustive literature review we have seen that soft dimensions have positive impact on GSCM implementation (see Table 6). It includes top management commitment, employee involvement, organizational culture, team work, green motivation, customer relationship and supplier relationship.

GSCM hard dimensions

It refers to strategy, technology and policy adopted by firm to implement GSCM successfully. We have identified from literature review, that hard dimensions of GSCM has positive influence on GSCM implementation (see Table 6). It includes lean manufacturing, total quality management, technologies for cleaner production, product innovation, green logistics, green purchasing and regulatory norms.

According to American Society for Quality "*Critical success factors allow an organization to assess the success of a project, selection process, or other activities with stated goals*…."In other words it is a strategic tool. Based on extensive review we have presented a non-exhaustive list of CSFs as shown in Table 6, which we have further classified into two broad categories. One group of CSFs has its root in production management and another group which its root in human resource management. The first group is referred as hard dimensions of GSCM and another group which is known as soft dimensions of GSCM.

Table 6: Critical Success Factors (CSFs) of GSCM

Dimensions	CSFs	References
GSCM hard dimensions	Lean Manufacturing	Farish 2009; Franchetti et al., 2009; Deif 2011; Dues et al., 2013; Dubey and Ali, 2015a
	Total Quality Management	Pauli 1997; Murovec et al., 2012; Prajogo et al., 2012; Pereira-Moliner et al., 2012; Dubey and Ali, 2015a
	Supplier Relationship Management	Bierma and Waterstraat 1999; Vachon and Klassen 2006; Hsu and Hu 2009; Bai and Sarkis 2010; Ku et al., 2010; Testa and Iraldo 2010; van Hoof and Lyon 2013; Dubey and Ali, 2015a
	Technologies for cleaner production/green manufacturing	Sikdar and Howell 1998; Zhang et al., 2013; van Hoof and Lyon 2013
	Institutional Pressures	Zhu et al., 2005; Tsoulfas and Pappis 2006;Sarkis et al.,2011; Singh et al.,2012
	Green Logistics	Zhu et al.,2007;Bjorklund,2011; Singh et al.,, 2012
	Green Purchasing	Narasimhan and Carter,1998;Carter et al.1998;Gilbert,2000;Zhu et al.,2007;Bjorklund ,2011; Singh et al.,2012;Blome et al.,2014
	Innovation	Olugu et al.,2011;Muduli et al.,2013

GSCM soft dimensions	Top management commitment	Siaminwe et al., 2005; Stone 2006; Brown and Stone 2007; Berkel 2007; Deif 2011; Despeisse et al., 2012; Law and Gunasekaran, 2012;Singh et al.,2012; Dues et al., 2013; van Hoof and Lyon 2013
	Employee involvement	Atlas and Florida,1998;Chien and Shih,2007;Hsu et al.,2008;Luthra et al.,2011
	Customer Relationship Management	Seuring et al.,2007;Baines et al.,2012
	Organizational culture	Fernandez et al.,2003;Govindarajulu and Daily,2004;Jabbour and Santos,2008
	Team work	Kaitazawa and Sarkis,2000;Daily and Huang,2001;Govindarajulu and Daily,2004;Jabbour and Santos,2008;Massoud et al.,2011;Muduli et al.,2013
	Green motivation	Wee and Quazi,2005; Muduli et al.,2013

4.4.2 Process

In this we have considered five major activities along supply chain network. It includes procurement, inbound logistics, manufacturing, outbound logistics and reverse logistics.

Green procurement

It is defined as aligning environmental policies, with the traditional procurement process. Green procurement emphasizes on reduction of waste produced, material substitution through environmental sourcing of raw materials, waste minimization of hazardous materials and so on (Dubey et al.,2013). The involvement and support of suppliers' is crucial to achieving such goals. The contributions which shows positive linkage between green procurement and superior organizational performance (e.g. Zsidin and Siferd,2000;Carter et.2000;Walker and Philips,2000;Bala et

al.,2008;Salam,2008;Dada et al.,2010;Tripathi and Petro,2010;Yen and Yen,2011;Gavronski et al.,2011;Dubey et al.,2013).

Green logistics (Inbound and Outbound logistics)

Transportation and warehousing are two important activities of logistics. The transportation is one of the major contributors of pollution. In order to achieve sustainability, greening of transport is one of the major challenges in front of transportation companies or 3PL service providers(e.g.Mahler,2007;Turner and Houston,2009;Hopkins,2009;Berns et al.,2009;Golicic et al.,2010;UNEP,2011;Blanco and Cottrill,2013).In recent years green logistics has attracted interest among academia (e.g. Marin and Pelegrin 1998, Jayaraman et al., 1999, Fleischmanin et al., 2001, Krikke et al., 2003, Lu and Bostel 2007, Ko and Evans 2007, Min and Ko 2008, Lee and Dong 2008, Easwaran and Uster 2009, Wang and Hsu 2010, Zarei et al., 2010, Easwaran and Uster 2010;Sundarakani et al.,2010;Scipioni et al.,2012).

We can define ***green logistics*** can be thought of as an approach for planning freight logistics systems that incorporates sustainability goals with a primary focus on the reduction of environmental externalities (Sathaye et al.,2006).Rodrigue et al.,2001 argued in their work that lack of proper understanding among practitioners, result into un resolved conflict. These conflicts are presented as "*green logistics paradoxes*" in the Table 7.

Table 7: Paradoxes of green logistics

Dimension	Outcome	Paradox
Costs	Reduction in costs through packaging and reduction of wastes. Benefits are derived by the distributors.	Environmental costs are often externalized.

Time/Flexibility	Integrated supply chains, JIT and Door-to-Door often provide flexibility and efficient physical distribution systems.	Extended production, distribution and retailing often produces more carbon footprints, occupy more space and consumes more energy.
Network	Increasing system wide efficiency through hub & spoke distribution.	Concentration of pollution along the hub and corridors. Pressure on local communities.
Reliability	Reliable and on-time distribution of freight and passengers.	Air and Road modes of transportation are more threat to environment.
Warehousing	Reducing the needs for private warehousing.	Inventory in part shifting to roads often leads to congestion and traffic abnormalities.
E-commerce	Increased business opportunities and diversification of supply chains.	Changes in physical distribution systems towards higher levels of energy consumptions.

Green manufacturing

The green manufacturing has attracted serious attentions from academia and practitioners in recent years. There are lot of initiatives from corporate houses like IKEA, McDonalds, Sony, Godrej & Boyce, Bharat Forge,DuPont,IBM etc. which is a non-exhaustive list of companies who have imbibed green production or manufacturing in their corporate strategy(Baines et al.,2012;CII-BCG Report,2013).We have reviewed some of the extant literature like(e.g.Melnyk and Smith,1996; Polcari,2007;Sutor,2007;Baines et

al.,2012;Gunasekaran and Spalanzani,2012), we can conclude that, "green manufacturing is a collection of activities that involves conversion of inputs into desired product, such that emissions of hazardous substances which are harmful to human health and environment are minimized without compromising with product quality in an economical way.

The dimensions of green manufacturing are:

- Green products(e.g.Kleiner,1991;Hart,1995;Hart,1997;Ginsberg and Bloom,2004;Baines et al.,2012);
- Green processes and operations (Porter and van der Linde, 1995;Ball et al.,2009;Kabir and Madugu,2010;Wernet et al.,2010;Mukherjee,2010;Gunasekaran and Spalanzani,2012).

Reverse logistics

Srivastava (2007), which is one of the most cited literature, has presented a comprehensive view of GSCM, with special focus on reverse logistics (RL).Govindan et al.,(2012), developed a framework for determining carbon footprints in a reverse logistic model. Based on seminal works (e.g.Tibben-Lembke, 2002; GuideJr. and van Wassenhove, 2003), we have identified two key dimensions for design of RL are product life cycle and variability of product returns.

The RL is a process that further safeguards natural resources and protect the environment (e.g.Kumar and Putnam,2008;Houe and Grabot,2009;Gunasekaran and Spalanzani,2012). The researchers in recent years have proposed sustainable closed loop supply chain network design (SCLSC),which focuses on dual objectives i.e. reduction of cost and reduction of carbon footprints (e.g.Wang et al.,2011;Chaabane et al.2012). Seuring (2013) and Brandenburg et al.,(2014), have carried out comprehensive reviews on various mathematical models used for building sustainable supply chain model which includes RL and CLSC network design.

We there for consider RL as an important process and how the soft GSCM and hard GSCM dimensions can influence RL performance, is the missing link in current literature, which we have reviewed. We have further categorized literature into six key practices as we have discussed in Table 8 as:

Table 8: GSCM practices

GSCM practice	References
Green procurement	Min and Galle,1997;Carter et al.,2000;Zsidisin and Siferd,2001;Vachon,2007;Zhu et al.,2008;Stefan and Paul,2008;Bala et al.,2008;Salam,2008;Holt and Ghobadian,2009;Paulraj,2009;Tripathi and Petro,2010;Bjorklund,2011;Yen and Yen,2011;Large and Giminez Thomsen,2011;Azevedo et al.,2011;Gavronski et al.,2011;Routroy and Pradhan,2012;Dubey et al.,2013.
Green inbound logistics	Mahler,2007;Turner and Houston,2009;Hopkins,2009;Berns et al.,2009;Golicic et al.,2010;UNEP,2011;Blanco and Cottrill,2013
Green manufacturing	Azzone and Nocci,1998;Sutherland et al.2008;Kim et al.2010;Narula and Upadhyay,2011;Zailani et al.,2012;Daily et al.,2012;Wong et al.,2012;Choi and Chui,2012;Digalwar et al.,2013;Nouira and Frein,2014;Chen et al.,2014;Golini et al.,2014.
Green outbound logistics	Murphy et al.1994;Murphy et al.1995;Murphy and Poist,2000;Rao and Holt,2005;Zhu et al.,2008;Holt and Ghobadian,2009;Routroy,2009; UNEP,2011;Blanco and Cottrill,2013.
Reverse logistics	Carter and Ellram,1998;Lippmann,1999;Rao and Holt ,2005;Hu and Hsu,2006;Zhu et al., 2007;Vachon

	2007;Routroy,2009;Govindan et al.,2012;Sheriff et al.2012;Soleimani et al.,2014.

Table 8 present non-exhaustive list of references based on review of literature published in reputable journals, reports and edited books provides an interesting insight. From above list it can be concluded that in last five years, i.e. between 2008 to early 2014, there are over 80 % contribution in the field of GSCM. Second, most of the references are derived from MIT Sloan Review and Supply Chain Management Review along with other reputable academic journals, clearly suggest the popularity of the subject among practitioners and academia. However, most of the studies have focused on impacts of these GSCM practices on environmental performance or financial performance; however there are few concerns related to measurement of social benefits. We will further discuss in detail in our conclusion section where we will provide further research opportunities in the field of GSCM.

Based on extensive discussions we derive following research propositions as:

P1: The soft dimensions of GSCM has postive impact on the process;

P2: The hard dimensions of GSCM has positive impact on the process;

4.4.3 Output

In this section we will discuss the impacts of GSCM CSFs on organizational performance. Like any management philosophy, GSCM is also a subject of debate. The growing popularity of the subject has received several criticisms. In various forums and blogs, it has received criticism regarding its feasibility and sustainability. However, under the cover of wide criticisms, the exponential rise in literature published in reputable journals and magazines, that GSCM initiatives adopted by most of the firms has helped firms to improve their performance in terms of financial and non-financial which are critical for the

sustainable growth of the firms (e.g.Zhu and Sarkis,2004;Zhu et al.,2005;Zhu et al.,2008;Zeng et al.2010;Dues et al.,2013;Dubey and Bag,2013;Yusuf et al.,2013;Schrettle et al.,2014).

An attempt has been made to classify GSCM practices impacts on performance literature, in three broad categories which are determinants of sustainable performance are:

- Economic performance/financial performance;
- Environmental performance;
- Social performance;

The three performance dimensions and their measures are presented in the Table 9.

Table 9: GSCM performance measures

Performance measure	Item	References
Economic perspective	Environmental cost	Hervani et al.,2005;Zhu et al.,2007;Chardine- Baumann and Botta-Genoulaz,2011.
	Supply chain cost	Olugu et al.,2011; Chardine-Baumann and Botta-Genoulaz,2011;Ageron et al.,2012.
	Cost to quality	Hervani et al.,2005;Azevedo et al.,2011;Chardine- Baumann and Botta-Genoulaz,2011; Ageron et al.,2012.
	Responsiveness cost	Gunasekaran et al.,2004;Azevedo et al.,2011;Chardine- Baumann and Botta-Genoulaz,2011;Ageron et al.,2012.

Environmental perspective	Environmental technology	Azevedo et al.,2011 and Deif,2011.
	Recycling efficiency	Hervani et al.,2005; Deif,2011.
	Eco packaging	Hervani et al.,2005;Zhu et al.,2007; Zhu et al., 2008; Dues et al., 2011; Kim et al., 2011; Bhateja, et al., 2012, Seman et al., 2012;Whitelock 2012.
	Level of process management which includes pollution control, waste emissions, carbon footprints etc.	Hervani et al.,2005; Zhu et al., 2008; Dues et al., 2011; Kim et al., 2011; Bhateja, et al., 2012, Seman et al., 2012;Gangele et al., 2012; Whitelock 2012.
Social Perspective	Management commitment	Hervani et al., 2005; Zhu et al., 2007; Azevedo et al., 2011.
	Customer satisfaction	Zhu et al.,2007;Markley and Davis,2007;Pocampally et al.,2009; Gunasekaran and Spalanzani,2012;Dues et al., 2013; Gavronski et al., 2013.
	Employee development	Markley and Davis,2007;Pochampally et al.,2009.

From Table 9 we can conclude that the performance framework reflects triple bottom line (TBL), approach which are now increasingly being adopted by corporates. However, it can be debated on the metrics adopted by researchers to measure social performance. Air pollution is the major factor for the deteriorating health conditions of the human beings. It leads to respiratory infections, heart disease, COPD, stroke and lung cancer. WHO report (2014),

estimated that 7 million peoples dies due to air pollution. India and China are two countries which has high mortality rate due to air pollution. Hence, the social performance measures must include metrics which measures reduction in mortality rate due to reduction in carbon emissions, decrease in heart disease, decrease pneumonia patients and other pollution related disease. We have not come across any studies have been conducted in GSCM field where mortality rate or decrease in heart patients were considered. Thus, we address this as one of the gap in current GSCM literature.

Based on discussions we can draw our third research proposition:

P3: The process management has positive influence on organisational performance measured in terms of environmental performance, economic performance and social performance;

4.4.4 Green Intellectual Capital (GIC)

The GIC is the dimension which can help firm to enhance their competitiveness. The GIC can be regarded as moderating variable (Lopez-Gamero et al.,2010).it has been further classified into three categories as:

- Human capital;
- Green structural capital;
- Green relational capital.

The fourth proposition of our study is:

P4: The GIC has moderating influence on process management;

4.4.5 Moderating Effects of Product Complexity

In past supply chain complexity has received significant attention from researchers (e.g. Choi and Krause, 2006; Bozarth et al. 2009). The product complexity can be understood from both product as well from portfolio level (Jacobs, 2013). We argue in our present research that even some research in

past (e.g. Fisher et al., 1999; Ramdas and Sawhney, 2001; Closs et al., 2010) have found the negative impacts of product complexity on firm performance, product complexity provides the basis for the firm to increase the performance of the organization through proper exploitation of green supply chain network. The supply chain properties in GSCM network can be exploited through principle of modular designs and innovation like postponement strategy (Ethiraj and Levinthal, 2004). Hence our fifth and sixth propositions of our study is:

P5: The product complexity has moderating effect on the influence of soft dimensions on the process management;

P6: The product complexity has moderating effect on the influence of the hard dimensions on the process management;

4.4.5 Control Variables

4.4.5.1 Environmental Uncertainty

Chen and Paulraj (2004), regarded uncertainty as an important construct. Davis (1993) suggests that there are three sources of uncertainty which impact supply chain network: supplier uncertainty which arises from on-time performance, average delay, lack of availability of modes of transportation, or delay in plant due to loading; manufacturing uncertainty arising from process performance, machine breakdown, labor strikes etc.; demand uncertainty arising from forecast errors, new product launch, irregular orders etc. In our present study we restrict our discussion to uncertainty in forms of supply, demand and technology. We therefore argue that environmental uncertainty may have confounding effect on impact of soft GSCM factors and hard GSCM factors on entire process in a green supply chain network as shown in Figure 1. To fully account for the differences among organizations, we must control the environmental uncertainty (i.e. uncertainty due to supply, technology and demand).

4.4.5.2 Organizational Size

In our study we recommend based on extant literature that number of employees and revenue as two measures of organizational size. We argue in our study that bigger size, permits organizations to foster adaption mechanisms such as maintaining shadow systems and slow phasing out of legacy systems. Whereas larger organizations can withstand organizational hurdles by virtue of their size, for smaller organizations survival is more immediate concern. Hence the organization size must be controlled during statistical analysis.

5. Conclusions, unique contributions and further research directions

In our present paper we have made an attempt to synthesize current literature from those research communities addressing GSCM/SSCM issues. Our present paper is guided by three research questions as:

RQ1: What are the key constructs of GSCM practices?

In response to question RQ1, we have undertaken systematic literature review of current literature covering GSCM, SCM, sustainable manufacturing, carbon footprints, environment, health & hazards.

We have made an attempt to define GSCM from various scholars point of view. We have further presented in Table 1.We further classified literature based on specific contribution to GSCM theories. This effort has helped us to further identify recent trends in contribution to specific GSCM theories. We have classified based on contributions into 13 GSCM theories as shown in Table 2.

Once we have identified, GSCM theories we further classified literature based on GSCM factors which are critical for successful implementation of GSCM. We have identified these factors as CSFs based on contributions made by various scholars. We have further classified these CSFs into hard and soft

dimensions of GSCM, which is our unique contribution to the current GSCM literature.

RQ2: Can we propose a comprehensive framework for GSCM implementation?

This is our main focus of our paper. The aim of proposing a theoretical framework was to address some of the key issue which we have identified through review of current literature. We have structured and aligned our review of literature, in a logical way depicting systems components. We have further classified our literature so that we can classify literature into building block of conceptual GSCM framework. Our building blocks of a GSCM framework are classified into four major components such that each set of variables represent input, process, output and environment of the GSCM framework.

The proposed framework contributes to systems theory and knowledge based view theory. We have further provided metrics for measuring performance of GSCM network. In our framework we have further considered environmental uncertainty and product complexity which were not addressed in past in GSCM literature.

5.1 Theoretical Contributions

Whetten (1989), in his seminal work, "What contributes a theoretical contribution?" out of these the most fundamental questions are what, how and why those form the basis of this paper. Any theory paper is supposed to define the basic constructs dimensions or elements constituting the framework (what), for example, in our research we have identified performance dimensions and the antecedents influencing the performance. However, in context to grounded theory research, through explicit process of content analysis methodology is provided to identify elements/variables, the methodological framework is comparatively weak to answer "how" and "why", in terms of relationships (see Sushil, 2012). However in spite of the limitation our research

has made significant attempt to extend the similar attempts like (Malviya and Kant, 2014) by proposing a conceptual framework after identifying research gaps on the basis of extensive review of 248 articles. The current framework is firmly grounded in organizational theories (like Knowledge Based Theory) which requires significant attentions (see Sarkis et al. 2011). Conceptual framework for GSCM is our principal contribution. In next section we will provide our

5.2 Managerial Implications

Our study is an attempt to propose a conceptual framework for GSCM implementation. However there are various attempts by the scholars in this direction. Our attempt is based on critical review of 248 articles to highlight the need for translating knowledge as one of the resources to implement GSCM in the organization. In this way we provide theory focused framework, which provides clear differentiation from existing frameworks and the current framework.

5.3 Further research directions

We feel that our effort, will certainly offer multiple research directions. In this section we have outlined some of the research directions as:

- Most of the previous studies have adopted positivism approach or interpretivism approach. However realism philosophy has not been explored particularly in operations and supply chain management related research. Although we acknowledge that interpretivism or positivism and to some extent realism in recent years, have been the philosophies mostly used by the researchers in the field of operations and supply chain management areas, nevertheless research communities need to be sensitive to accepting other philosophies;
- We further propose to build an integrated GSCM framework which integrates both forward and reverse supply chain;

- The above framework can further be extended from contingency theory perspective. In this way the acceptability of the framework will further enhance;
- In context to conceptual framework building, we have used literature review. However, literature review in most cases in alone cannot resolve the conflict related to nature of linkages among constructs of the framework. In such case when literature review is not conclusive, graph theory methods like ISM,GTMA,TISM etc. are found to be more useful (Sushil,2012);
- There is a scope for researchers to further explore, the impact of GSCM practices on health of human beings and can further address the flora and fauna sustainability;
- Investigate the mediating effect of product complexity on GSCM performance;
- The behavioral dimensions of GSCM need further attentions;
- There is need for cross-cultural comparison of top management personality for GSCM implementation;
- The study of impacts of cultural dimensions on GSCM network need further investigation

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