

GREEN AND SUSTAINABLE SUPPLY CHAIN MANAGEMENT ON OPERATIONAL PERSPECTIVE: A LITERATURE REVIEW

Thanyaphat Muangpan, Piyawat Chanintrakul

Faculty of Logistics, Burapha University, 169 Long-Hard Bangsaen Road, Saen Sook Sub-district,
Mueang District, Chonburi, 20131, Thailand
Email: thanya_donut@hotmail.com, piyawatc@buu.ac.th

ABSTRACT

Purpose: The purpose of this paper is to present a comprehensive review of the literature available that addresses Green supply chain management (GSCM) and Sustainable supply chain management (SSCM) from an operational perspective between 2007-2012, identify any research gaps and future research opportunities.

Design/methodology/approach: Content analysis was employed in this paper to analyse and classify 150 articles of GSCM and SSCM research recorded in the databases of Emerald, SpringerLink, ProQuest and Science Direct between 2007–2012.

Findings: The findings of the research work include the classification of GSCM and SSCM research. This research area can be divided into 4 categories i.e. environmental effects, strategic, operational and regulation perspective. The operational perspective has been emphasized and future studies and research opportunities have been proposed.

Research limitations/implication: the research outputs reviewed were only based on published peer-reviewed international journals; any other forms of publications (i.e. research working papers, conference papers and dissertations) have been excluded.

Practical implications: The operational perspective and new research issues are proposed as knowledge for the development of organizations more efficiently.

Originality/value: This paper summarizes available knowledge related to GSCM and SSCM, especially from the operational perspective and highlights guidelines for any future research.

Keywords: Literature review, Sustainable supply chain management (SSCM), Green supply chain management (GSCM), Operational perspective and Content analysis.

Introduction

The cross-disciplinary field of GSCM has been growing in recent years with an interest from both academic and industry (Sarkis et al., 2010). In an academic manner, scholars as well as researchers attach an importance to the approach and take the concept of GSCM being applied widely (Sarkis et al., 2011). As a result, the concept of GSCM has become a lesson for university students, the integration of research works by researchers along with the establishment of associations that are a driving force behind GSCM. Such implementation results are in most likelihood the development in academic circles (Sarkis, 2007).

From an industry perspective, enterprises are recognizing that environmental management is a key strategic issue with the potential of having a lasting impact on an organization (Diabat and Govindan, 2010). Green supply chain management (GSCM) has emerged as an important new approach for enterprises to achieve profit margins and gain market share objectives by reducing environmental risk and impact (Li et al., 2011). The inception of GSCM was marked by the attempt to reduce carbon dioxide emissions of transportation and product distribution-related activities (Mckinnon, 2010). Subsequently, attention has been extended to reverse logistics which is the adoption of reuse and the procedures to return products to be destroyed. (Srivastava, 2006; Hazen et al., 2011).

In later periods, the development of integrating diverse activities has begun within supply chain management and has coupled with the development of environmental management or what is called GSCM. (Diabat and Govindan, 2010; Shi et al., 2012). GSCM is concerned with the integration of various activities in supply chain with the environmental management purpose of reducing waste, pollution and environmental impact to a minimum. (Zhu et al, 2008; Sarkis, 2010; Srivastava, 2007). Until recently, the range of management has been developed by introducing the concept of sustainable development to be integrated with supply chain management. Sustainable supply chain management(SSCM) is to bring the concept of triple bottom line which includes the environmental, social and economic factors for integration in the supply chain management to improve the supply chain management towards sustainability (Faisal, 2010; Hall and Matos, 2009; Koplin et al., 2007) with broader scope than GSCM. This is because GSCM only considers environmental factors while SSCM extends the scope to cover social and economic elements (Carter and Easton, 2010; Cetinkaya et al., 2008; Dao et al., 2011) in addition to taking into account the environmental factor. The research on GSCM and SSCM related to operation management ranges from products such as raw materials to finished products to be delivered to consumers (Styles et al., 2012) which are essential to the business, in order to find guidelines as well as opportunities to develop research in the future.

The purpose of this paper is to present a comprehensive review of the literature addressing GSCM and SSCM from operational perspectives during the period 2007-2012 and identify any research gaps and opportunities. The remaining sections of this paper cover; Design, methodology, approach, findings, discussion and conclusion.

Design /methodology/approach

The methodology employed in this paper is content analysis in order to conduct literature review. Content analysis is a qualitative research technique which comprises classification and information system arrangement with the aim of describing elements and relationships (Bernard and Ryan, 2010). Therefore, at present the researchers have brought this technique to be applied extensively to the literature review for the purpose of finding future research gaps and opportunities (Wiese et al., 2012; Seuring and Gold, 2012; Haze metal, 2012).

The authors have focused on academic peer-reviewed journals published between 2007-2012 by using the key words “GSCM” and “SSCM” utilizing four databases including Emerald, SpringerLink, ProQuest and Science Direct. MS Access was the database tool used to search such literature.

Findings

The literature review is concerned with a collection of articles and content analysis from the total of 150 articles dating back 6 years between 2007-2012. The number of articles on the A.D. year basis can be summarized as shown in Figure 1.

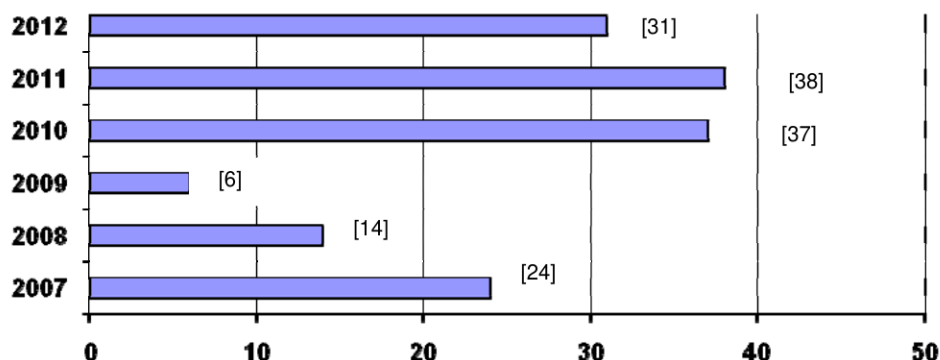


Figure 1 : Number of reviewed papers per year ([-] is the number of articles)

Most articles during the year 2007 were the articles about the concept and structure of GSCM (Sarkis, 2007), stimulating factors, operations, as well as measuring the performance of GSCM (Zhu et al., 2007). In addition, it can be observed that the articles began to introduce the concept of sustainable development to be applied to supply chain management. However, the majority were almost entirely literature review (Ansett, 2007; Markley et al., 2007; Svensson, 2007). In the year 2008, most of the articles presented the concept of GSCM to be applied increasingly to different activities associated with supply chain management and business organization (Lee, 2008; Michelini et al., 2008; Srivastava, 2008). The research on sustainable development introduced the triple bottom line concept as key element in the development of supply chain management. Most articles were still in the form of literature review and the creation of various frameworks (Carter and Rogers, 2008; Seuring and Muller, 2008; Seuring and Sarkis, 2008; Hutchins et al., 2008). The articles for this literature review during the year 2009 were quite a small number. Most articles had similar characteristics to the research in the year 2008 with the difference that the researchers began to focus on sustainable development through furthering the research done in the past (Mark and Zhaohui, 2009; Badurdeen et al., 2009; Krause et al., 2009).

During the period 2010-2012, there was a significantly and remarkably growing number of articles that have been brought for literature review. Most of the research has focused on the interest in sustainable development in the first rank. There was an increased research development, from the literature review as preliminary framework to become concept and framework for the development of operations, increasingly measuring the performance of implementation. (Xia and Tang, 2011; Peters et al., 2011; Long et al., 2010; Lee et al., 2012; Gopalakrishnan et al., 2012). Regarding GSCM management, the research has been developed in terms of increasing the measuring of GSCM performance. (Kim and Min, 2011; Bjorklund et al., 2012; li, 2011). Based on 150 articles, with GSCM-related content the highest number represented up to 83 articles. This is followed by the SSCM – related articles. It can be said that the trend was on the increase in comparison with the past (Carter and Easton, 2011; Fabbe-Costes et al., 2011; Gupta and Palsule-Desai, 2011).

Classification of GSCM and SSCM research

It has been found that data relating to the research on GSCM and SSCM can be classified into 4 categories as show in Figure 2. These include **environmental effects perspective**, a research group that studies the impact of supply chain management which affects the environment; **strategic perspective**, a research group related to the development of different strategies as well as GSCM and SSCM – related methods to develop the organization and establish a competitive advantage; **operational perspective**, a research group concerned with the management of organizational operations, coupled with the integration related to environment and sustainable development and **regulational perspective**, a research on different rules, regulations, and policies of the organization for consideration in conjunction with the environment and sustainable development

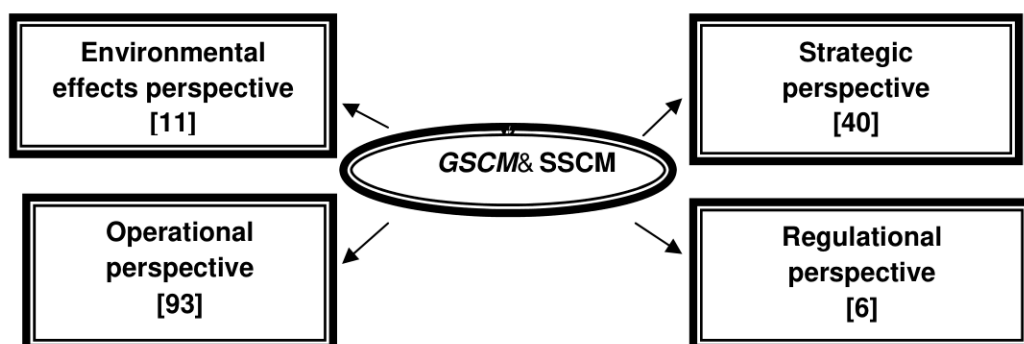


Figure 2 : Classification of GSCM and SSCM ([-] is the number of articles)

From Figure 2, it has been found that the research in operational perspective type shows the highest number. It is concerned with research on management in the acquisition of goods to be delivered to consumers with the articles that present the management of supply chain both as a whole and with separation of each individual activity (Bjorklund et al., 2012; Zhu et al., 2010), followed by the research on strategic perspectives that brought different concepts and theories related to GSCM and SSCM to be applicable in creating a competitive advantage for business organizations including a strategy of creating competition, innovation, risk management as well as decision-making. (Colicchia et al., 2011; Hojmosse et al., 2012; Chen et al., 2012). The last two ranks are research on environmental effects perspective and regulatory perspective with a rather small number of articles of research since it is about research into specific area as well as being related to various rules and regulations which vary greatly in each individual country. This results in a small number of researchers as well as the fact that the operations are conducted specifically in a particular group (Mckinnon, 2010; Arimura et al., 2011).

GSCM and SSCM on operational perspective

This paper focuses on the research from an operational perspective because the research in this category is the major issue on which the business sector attaches particular importance (Ferrell et al., 2008; Thomas and Scott, 2009). The type of research from an operational perspective can be divided into 6 subgroups. The first four subgroups are the research group with focus on logistics activities as show in Figure 3. These include the fields of Green purchase and procurement, Green manufacturing and production, Green transport and distribution and Reverse logistics. The other two subgroups focus on the management of the whole supply chain, that is to say, the research group in the areas of GSCM and SSCM.

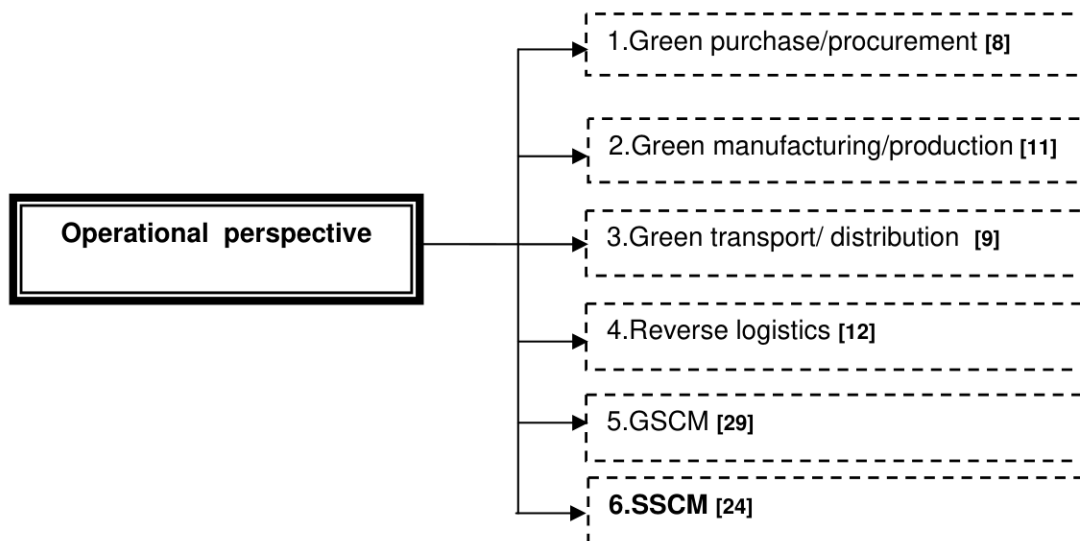


Figure 3: Classification of GSCM and SSCM from an operational perspective
([-] is the number of articles)

In terms of the first four subgroups, 1.Green purchase and procurement: is a research group related to procurement, coupled with environmental management and sustainable development(Lee, 2008). The research work in this group is the link between the organization and suppliers. 2. Green manufacturing and production is a research group associated with production of goods and services by applying the concept related to GSCM and SSCM (Zhu et al., 2010; Koplin et al., 2007). Moreover, this includes research into assessment of production performance for environment (Lai and Wong, 2011; Tseng and Chiu, 2010) 3.Green transport and distribution is research into transport development and goods distribution to minimize the environmental impact and use energy in a worthwhile manner as well as to reduce carbon dioxide emissions in transportation – related activities

and goods distribution (Mckinnon, 2010; Michelsen and Magerholm Fet, 2009) 4.Reverse logistics is a research group into the reverse process with research development that is the basis of research relevant to GSCM and SSCM. Most of the research work is concerned with network design guidelines for operations, reuse and environmentally friendly disposal (Srivastava, 2007).

With regard to the other two subgroups, a group of research into GSCM focuses on integration , linking of both supply chain and guidelines of environmental performance in the supply chain (Bjorklund et al., 2012; Kim and Min, 2011; Sarkis, 2012). Moreover, the group of research on SSCM is attracting considerable attention nowadays with broader scope than GSCM in the integration of environmental, social and economic aspects (Carter et al, 2008), making business organizations more aware of the importance of SSCM (Xia and Tang, 2011) with the study of factors, operations management , and assessment measurement of SSCM performance extensively as well (Mann et al, 2009;Badurdeen et al, 2009) as content analysis in research on SSCM to seek the opportunities for developing research in the future.

SSCM on operational perspective

Presently, the concept of sustainable development has come to play an important role in business organizations. (Fabbe-Costes et al., 2010; Xia and Tang, 2011). The concept of sustainable development has existed for a long time but has only been prevalent in environmental and social management. When business organizations recognize such importance, the concept has been applied to the development of the business organization in conjunction with supply chain management (Ansett, 2007; Gupta and Palsule-Desai, 2011; Svensson, 2007; Carter and Rogers, 2008) by integrating the entire supply chain management coupled with environmental care, business management with social responsibility together creating profitability and advances to the business (Cetinkaya et al., 2010).

Based on above, it has been determined that SSCM is an issue that is receiving much attention presently. Therefore, we have an interest reviewing the literature reviews as well as the content analysis of articles to determine issues for future research. We have brought the articles related to SSCM of the type of research into operational perspective for content analysis. In this regard, major factors of sustainable development including Economic, Social and Environmental (Theis et al., 2012) as well as the concept of operations quality management or PDCA (Durward and Art, 2011) that have been applied to the analysis and objectives of articles brought for content analysis. It can be classified SSCM on operational perspective into four main area as illustrated in Figure 4. These include Plan, Process, Control, and Improvement.

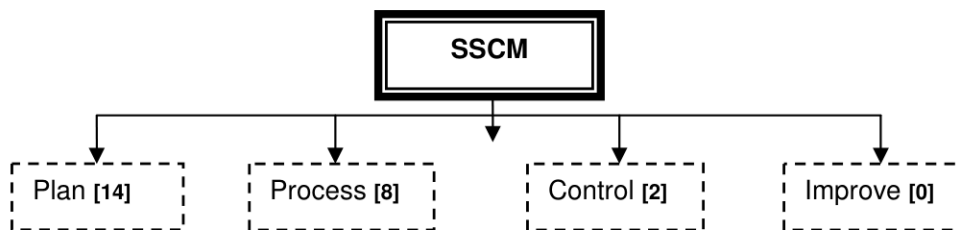


Figure 4 : Classification of SSCM on operational perspective ([-] is the number of articles)

From Figure 4; The total of twenty four articles form the study of SSCM of the research from an operational perspective. It has been found that “Plan” form the main article objectives mainly as guidelines for planning to get access to SSCM. The authors of articles use the method of literature review (Gopalakrishan et al., 2012; Ashby et al., 2012; Kang et al., 2012), followed by “Process”. Most of the articles present operations management in the field of SSCM with different methods of implementation (Keating et al., 2008; Beske et al., 2012; Walker et al., 2012). The minimal purpose of articles with the Content analysis conducted is “Control”. In this area, two articles have been found

(Carter et al., 2008; Bai et al., 2012). The article that has not been located yet is “Improvement”. This article is related to SSCM development from an evaluation and control perspective.

Another view in regards to bringing articles for content analysis is by taking into consideration triple bottom line, it has been found that the articles take into account various factors including environmental factors on one side (Kang et al., 2012; Ansett et al., 2007; Dey et al., 2011) and considering two sides of factors, i.e. economic and social factors (Ashby et al., 2012; Hall, 2010; Faisal et al., 2010) as well as articles with integration of all three environmental, social, economic aspects (Mann et al., 2010; Badurdeen et al., 2009; Xia et al., 2011). Methods of research consists of three main types namely: Literature Review, Conceptual Theory and Case Study Analysis.

Discussion and conclusion

Nowadays, sustainable supply chain management (SSCM) is a new concept that has been accepted to be applied to business development in conjunction with environmental and society in an acceptable manner (Wolf, 2011; Lee et al., 2012). In this connection, three – faceted factors of the concept are applied to business process as well as supply chain management for the purpose of creating sustainable business organization and supply chain success (Faisal, 2010; Peters et al., 2011). As a result, this is the concept that we are interested in the studying more. The study has revealed that most of the research works are concerned with literature review in the fields of planning (plan) and the development of SSCM framework in terms of operations (process) only have been presented (Gupta et al., 2011; Ashby et al., 2012; Beske, 2012).

Furthermore, the articles in this area are small in number with growth in particular group, thus resulting in the need for more research. (Badurdeen et al., 2009; Mann et al., 2010; Carter and Easton, 2011). In addition, the research into control and improvement has been found to be in considerable shortage (Bai et al., 2012). These two aspects of research are crucial because they are tools to be used for performance measurement of SSCM. Moreover, they enable the business organization to be aware of getting access to SSCM and developing one’s own organization truly. This is the key to the success of business organization (Walker and Jones, 2012). In this regard, the emphasis is put on the integration of all 3 factors of SSCM to generate balance (Carter and Easton, 2011). An importance is also placed on the research implementation that requires both qualitative and quantitative techniques so as to reduce errors as well as to increase the efficiency of research in the future.

The limitation of this literature review is that, we have gotten the results of this research from the literature review on the basis of four databases Emerald, SpringerLink, ProQuest and Science Direct. This may not cover the research on the basis of other databases with focus on the research in the type of operations management as well as the development of literature review by applying the technique of content analysis originated from the critical thinking of the research. This may cause potential bias in the analysis (Wiese et al., 2012; Seuring and Gold, 2012; Haze metal, 2012) as well as the lack of content analysis of articles related to three areas of research including environmental effects, strategic and regulation perspective.

The development of future research should be conducted with a review of other databases. Furthermore, it is recommended to carry out the content analysis of articles in all four aspects completely as well as include the use of a quantitative method for additional analysis. Regarding the research into GSCM and SSCM in operational perspective types, especially in regards to the research on SSCM there still needs the development of research in several areas including the implementation process, performance evaluation, control and development of performance from SSCM evaluation. In terms of taking into account social, environmental and economic factors of sustainable development, it should be tied to a way of creating balance and to be integrated into supply chain effectively.

References

- Andic, E., Yurt, O. and Baltacioglu, T. (2012), "Green supply chains: Efforts and potential applications for the Turkish market", *Resources, Conservation and Recycling* 58, pp.50-68.
- Anonymous. (2008), "Strong Growth in Green Logistics", *World Trade*, Vol.21 No.12, pg.13.
- Ansett, S. (2007), "A Journey to Sustainable Supply Chains", *Employ Respons Rights J*, Vol.19, pp.295-303.
- Armendariz, P. V. A. (2011), "A framework for strategic sustainable supply chain design".
- Ashby, A., Leat, M. and Hudson-Smith, M. (2012), "Making connections: a review of supply chain management and sustainability literature", *Supply Chain Management: An International Journal*, Vol.17 Iss:5, pp.497-516.
- Badurdeen, F., Metta, H. and Gupta, S. (2009), "Taxonomy of Research Directions for Sustainable Supply Chain Management", *Proceedings of the 2009 Industrial Engineering Research Conference*, pp.1256-1261.
- Bai, C., Sarkis, J., Wei, X. (2010), "Addressing key sustainable supply chain management issues using rough set methodology", *Management Research Review*, Vol.33 Iss:12, pp.1113-1127.
- Bajdor, P. and Grabara, J. K. (2011), "Implementing "GREEN" elements into the supply chain – the review and examples", *Annales Universitatis Apulensis Series Oeconomica*, pp.584- 589.
- Beske, P. (2012), "Dynamic capabilities and sustainable supply chain management", *International Journal of Physical Distribution & Logistics Management*, Vol.42 Iss:4, pp.372- 387.
- Bjorklund, M., Martinsen, U. and Abrahamsson, M. (2012), "Performance measurements in the greening of supply chains", *Supply Chain Management: An International Journal*, Vol.17 Iss: 1, pp.29-39.
- Carter, R. C. and Rogers, S. D. (2008), "A framework of sustainable supply chain management: moving toward new theory", *International Journal of Physical Distribution & Logistics Management*, Vol.38 Iss:5, pp.360-387.
- Carter, R. C. and Easton, L. P. (2011), "Sustainable supply chain management: evolution and future directions", *International Journal of Physical Distribution & Logistics Management*, Vol. 41 Iss:1, pp.46-62.
- Cetinkaya, B., Cuthbertson, R., Ewer, G., Klaas-Wissing, T., Piotrowicz, W. and Tyssen, C. (2011), *Sustainable Supply Chain Management : Practical Ideas for Moving Toward Best Practice*, Springer-Verlag Berlin Heidelberg, London, United Kingdom.
- Dao, V., Langella, I. and Carbo, J. (2011), "From green to sustainability: Information Technology and an integrated sustainability framework", *Journal of Strategic Information Systems* 20, pp.63-79.
- Dekker, R., Bloemhof, J. and Mallidis, I. (2012), "Operations Research for green logistics – An overview of aspects, issues, contributions and challenges", *European Journal of Operational Research* 219, pp.671-679.
- Diabat, A. and Govindan, K. (2011), "An analysis of the drivers affecting the implementation of green supply chain Management", *Resources, Conservation and Recycling* 55, pp.659-667.

- Eltayeb K. T., Zailani, S. and Ramayah, T. (2011), "Green supply chain initiatives among certified companies in Malaysia and environmental sustainability: Investigating the outcomes", *Resources, Conservation and Recycling* 55, pp.495-506.
- Fabbe-Costes, N., Roussat, C. and Colin, J. (2011), "Future sustainable supply chains: what should companies scan? ", *International Journal of Physical Distribution & Logistics Management*, Vol.41 No.3, pp.228-252
- Faisal, N. M. (2010), "Sustainable supply chains: a study of interaction among the enablers", *Business Process Management Journal*, Vol.16 No.3, pp. 508-529.
- Gupta, S. and Palsule-Desai, D. O. (2011), "Sustainable supply chain management: Review and research opportunities", *IIMB Management Review*, Vol.23, pp.234-245.
- Hall, J. and Matos, S. (2010), "Incorporating impoverished communities in sustainable supply chains", *International Journal of Physical Distribution & Logistics Management*, Vol.40 No.1/2, pp.124-147.
- Harrie, W.M. and Bommel, V. (2011), "A conceptual framework for analyzing sustainability strategies in industrial supply networks from an innovation perspective", *Journal of Cleaner Production* 19, pp.895-904.
- Hazen, T. B., Cegielski, C. and Hanna, B. J. (2011), "Diffusion of green supply chain management: Examining perceived quality of green reverse logistics", *The International Journal of Logistics Management*, Vol.22 Iss:3, pp.373-389.
- Hervani, A., Helms, M. and Sarkis, J. (2005), "Performance measurement for green supply chain management", *Benchmarking: An International Journal*, Vol.12 No.4, pp.330-353.
- Hoek, I. V. R. (1999), "From reversed logistics to green supply chains", *Supply Chain Management: An International Journal*, Vol.4 Iss:3, pp.129-135.
- Hutchins, J. M. and Sutherland, W. J. (2008), "An exploration of measures of social sustainability and their application to supply chain decisions", *Journal of Cleaner Production* 16, pp.1688-1698.
- Kim, I. and Min, H. (2011), "Measuring supply chain efficiency from a green perspective", *Management Research Review*, Vol.34 No.11, pp.1169-1189.
- Krause, D. R., Vachon, S., Klassen, R. D. (2009), "Special topic forum on sustainable supply management : introduction and reflections on the role of purchasing management", *Journal of Supply Chain Management*, Vol.45 No.4, pp.18-25.
- Lai, K. H., Wong, W. Y. C. (2012), "Green logistics management and performance: Some empirical evidence from Chinese manufacturing exporters", *Omega : The international of Management science* 40, pp.267-282.
- Lee, S. Y. (2008), "Drivers for the participation of small and medium-sized suppliers in green supply chain Initiatives", *Supply Chain Management: An International Journal*, Vol.13 No.3, pp.185-198.
- Lin, C. Y. and Ho, Y. H. (2011), "Determinants of Green Practice Adoption for Logistics Companies in China", *Journal of Business Ethics*, Vol.98, pp.67-83.
- Li, Y. (2011), "Research on the Performance Measurement of Green Supply Chain Management in China", *Journal of Sustainable Development*, Vol.4 No.3, pp.101-107.

- Liu, S., Kasturiratne, D. and Moizer, J. (2012), "A hub-and-spoke model for multi-dimensional integration of green marketing and sustainable supply chain management", *Industrial Marketing Management* 41, pp.581–588.
- Mann, H., Kumar, U., Kumar, V. and Mann, J. S. I. (2010), "Drivers of Sustainable Supply Chain Management", *The IUP Journal of Operations Management*, Vol. 9 No.4, pp. 52-63.
- Murphy, P. R. and Poist, R. F. (2003), "Green perspectives and practices: A comparative logistics study", *Supply Chain Management: An International Journal*, Vol.8 No.2, pp.122-131.
- Neureuther, B. D. and Kevin, O. N. (2011), "Sustainable Supply Chain Management Programs In The 21st Century", *American Journal of Business Education*; Feb 2011, Vol.4 No.2, pp.11-18.
- Nikbakhsh, E. and Farahani, Z. R. (2011), "Humanitarian Logistics Planning in Disaster Relief Operations", *Logistics Operations and Management.*, pp.291-332.
- Nils, J. P., Hofstetter, J. S. and Hoffmann, V. H. (2011), "Institutional entrepreneurship capabilities for interorganizational sustainable supply chain strategies", *The International Journal of Logistics Management*, Vol.22 Iss:1, pp.52-86.
- Pagell, M. And Wu, Z. (2009), "Building a more complete theory of sustainable supply chain management using case studies of 10 exemplars", *Journal of Supply Chain Management*, Vol.45 No.2, pp.37-56.
- Peattie, K. and Crane, A. (2005), "Green marketing: legend, myth, farce or prophesy? ", *Qualitative Market Research: An International Journal*, Vol.8 No.4, pp.357-370.
- Pishvae, M. S. and Torabi, S. A., Razmi, J. (2012), "Credibility-based fuzzy mathematical programming model for green logistics design under uncertainty", *Computers & Industrial Engineering* 62, pp.624-632.
- Sarkis, J. (2006), *Greening the supply chain*, Springer-Verlag London Limited, London, United Kingdom.
- Sarkis, J., Zhu, Q. and Lai, K.H. (2011), "An organizational theoretic review of green supply chain management literature", *Int. J. Production Economics* 130, pp.1-15.
- Sarkis, J. (2012), "A boundaries and flows perspective of green supply chain management", *Supply Chain Management: An International Journal*, Vol.17 Iss:2, pp.202-216.
- Seuring, S. and Muller, M. (2008), "From a literature review to a conceptual framework for sustainable supply chain management", *Journal of Cleaner Production* 16, pp.1699-1710.
- Svensson, G. (2007), "Aspects of sustainable supply chain management (SSCM): conceptual framework and empirical example", *Supply Chain Management: An International Journal*, Vol. 12 Iss:4, pp.262-266.
- Tseng, M. L. (2011), "Green supply chain management with linguistic preferences and incomplete information", *Applied Soft Computing* 11, pp.4894-4903.
- Wang, H. F. and Hsu, H. W. (2010), "A closed-loop logistic model with a spanning-tree based genetic algorithm", *Computers & Operations Research* 37, pp.376-389.
- Wolf, J. (2011), "Sustainable Supply Chain Management Integration: A Qualitative Analysis of the German Manufacturing Industry", *Journal of Business Ethics*, Vol.102, pp.221-235.

Xia, Y. and Tang, L. P. T. (2011), "Sustainability in supply chain management: suggestions for the auto Industry", *Management Decision*, Vol.49 Iss:4, pp.495-512.

Xuezhong, C., Linlin, J. and Chengbo, W. (2011), "Business Process Analysis and Implementation Strategies of Greening Logistics in Appliances Retail Industry", *Energy Procedia* 5, pp.332-336.

Zhua, Q. and Sarkis, J. (2004), "Relationships between operational practices and performance early adopters of green supply chain management practices in Chinese manufacturing enterprises", *Journal of Operations Management* 22, pp.265-289.

Zhua, Q., Sarkis, J. and Geng, Y. (2005), "Green supply chain management in China: pressures, practices and performance", *International Journal of Operations & Production Management*, Vol.25 Iss:5, pp.449-468.