

## Green Supply Chain Management: A Literature Review

Zhang Dawei\*, Abu Bakar Abdul Hamid, Thoo Ai Chin, Kooi Chung Leng

Faculty of Management, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Johor Malaysia

\*Corresponding author: dawei\_2009utm@yahoo.com

### Abstract

In light of the grim situation in both the environmental and energy sectors, manufacturing enterprises are faced with the challenge of pursuing economic benefits while at the same time coordinating the development between supply chain and environment. As a brand-new management model under the framework of sustainable development, green supply chain management has attracted the growing attention of the academic and business world. This study will review the literature on green supply chain management through several aspects including green supplier.

**Keywords:** Green supply chain management; supply chain management; sustainability; green supplier

© 2015 Penerbit UTM Press. All rights reserved

### 1.0 INTRODUCTION

The term “Green supply chain management” (Simpson and Power, 2005; Srivastava, 2007; Lee, 2008), is also known as “Sustainable supply chain management” (Vasileiou and Morris, 2006; Piplani *et al.*, 2008; Craig and Dale, 2008; Svensson, 2007; Seuring and Müller, 2008) or “Environmental supply chain management” (Cote *et al.*, 2008; Walker *et al.*, 2008; Meisner *et al.*, 2008). It is a new research field which was derived from supply chain management and sustainable development (Wang *et al.*, 2007), involving the environmental problems in every pitch point of supply chain, and aims to reduce resource consumption, protect environment and balance the development of economy and environment (Allen and Chia, 2010). Because of the short research period, green supply chain and green supply chain management have not been researched and analysed in-depth.

### 2.0 EVOLUTION OF GREEN SUPPLY CHAIN MANAGEMENT

Since the industrial revolution, the development of national economies, along with changes in science and technology, has been accelerating, leading to the rapid enhancement of the ability of humans to exploit natural resources. However, along with this progress, environmental incidents have frequently occurred (Fitzherbert *et al.*, 2008; Greenpeace, 2007). Since the 1970s, the relationship among the population, source and environment have begun to be considered rationally and the concept of sustainable development was conducted in *Our Common Future* in 1987 (Nathalie *et al.*, 2011). Under multi-faceted environmental pressures, enterprises are required to improve their environmental performance (Handfield *et al.*, 2002). In this context, a new thought was mooted as a minor branch of logistic management research, which was the idea of integrating environmental elements into supply chain management (Zhu and Sarkis, 2004).

Full scale research into green supply chain started in the 1990s and derived from green purchasing. Webb (1994) studied the effects of some products on the environment. This study pioneered the theory of “green purchasing” which suggests the purchase of suitable materials based on environmental standards and attention to recycling. In 1995, an organization was set up by CIPS (Chartered Institute of Purchasing and Supply) and BIE (Business in the Environment), that particularly helped enterprises to strike a balance between business activities and environmental performance through improving supply chain management (Green *et al.*, 1998).

The concept of “green supply chain” was first published in a study called “Environmentally Responsible Manufacturing” in 1996 by the Manufacture Research Consortium (MRC) of Michigan State University. This study considered the development of manufacturing supply chains based on environmental influence and optimum resource utilization (Handfield *et al.*, 1997). In the same year, EPSRC (The Engineering and Physical Sciences Research Council) along with more than twenty other groups jointly sponsored a research, “ESRC Global Environment Change”. “Green Supply Chain Management” was the main research in this program (Green *et al.*, 2000). It was followed by ISO (International Standard Organization) and the launch of ISO 14000 series standards of environmental management system (Walton *et al.*, 1998). Since then, the term “green supply chain” has been discussed by various organizations and researchers who have offered their own views on green supply chain and green supply chain management. Min and Galle (1997) discussed how to factor environmental protection into supplier selection, and the effects of green purchasing on waste reduction. Beamon (1999) introduced some environmental elements into a supply chain model and offered a new supply chain design. Hoek (1998) spearheaded efforts to keep ecological balance in supply chain practical operation. In 1999, General Motors Corporation formed a green supply chain working group with another twelve

corporations. They aimed to find solutions to improve both the environmental and financial performance of supply chain management (Christmann, 2000).

In the academic field, The Centre for Advanced Purchasing Studies of US published Environmental Supply Chain Management which introduced some analytical tools and case studies (Narasimhan and Carter, 1998). Meanwhile, Texas Tech University founded Green Supply Chain Management Research Centre and showed their findings on green supply chain management research (Min and Galle, 2001). In August 2001, an international journal, *Greener Management International* published a special issue of Greening Supply Chain Management (Sarkis, 2001). Research in recent years has mainly employed qualitative analysis and less quantitative research (Jamal, 2009). More focus has been placed on green design (Arena et al., 2003; Srivastava, 2007), green purchasing (Murray, 2000; Wu et al., 2001; Zhang et al., 2014), environmental performance evaluation system (Dowell et al., 2000; Farrow et al., 2000; Sharma, 2000; Clemens, 2001) and reverse logistics (Shih, 2001; Srivastava and Srivastava 2006; Min et al., 2006). However, these existing researches are dispersive and have not yet formed a systematized theory (Sarkis et al., 2006). Many countries have invested in the research of green supply chain management. In both the research and practice of this area, Europe is better than the US, and both are better than Asia.

### ■3.0 GREEN SUPPLY CHAIN MANAGEMENT THEORY

At present, there is still no single uniform and authoritative definition of “green supply chain”. Such a definition is not to be found in the *Logistics Terms Standards* where the concepts and connotation of green supply chain and green supply chain management are still at the exploratory stage (Qinghua et al., 2010). However, publications about green supply chain management have been growing recently with various authors having created different definitions (Nagorney and Toyasaki, 2005). Similar to supply chain management, various authors have defined green supply chain management by focusing on the goals of their own investigations. Table 1 shows some typical definitions of green supply chain management, and these definitions include some new ideas such as strategic transformation of enterprise and green design of supply chain, leading to a great step forward in the theories of green supply chain and green supply chain management.

A review of previous studies, and based on the investigated goals of this research, the definitions of green supply chain and green supply chain management in this study are conducted as follows:

*Green supply chain is an innovative supply chain which complies with social development trends. It integrates economic performance, environmental performance and resource efficiency into the entire spectrum of supply chain activities involving raw materials and component purchasing, manufacturing, packaging, distribution, retailing, and the subsequent recycling of the products. It is a comprehensive strategic alliance consisting of suppliers, manufacturers, distributors, retailers, consumers and, lately, recyclers and governments. Great efforts are being made to reduce costs and increase economic benefits while improving environmental performance and minimizing resource consumption.*

*Green supply chain management is also known as environmental supply chain management or sustainable supply chain management, which is a modern management mode inspired by sustainable development ideas based on supply chain management techniques. It serves all the partners through planning, organizing, directing, controlling and coordinating material, information, capital and knowledge flows in green supply chains. Its objective is to achieve optimal allocation of resources, increase economic benefits and improve environmental consistency in the whole product life cycle so as to promote the coordinated development of environmental, social and economic performance.*

**Table 1** Definitions of green supply chain management

Authors	Definitions
Narasimhan and Carter (1998)	Green supply chain management is the effort of purchasing departments on activities such as reducing pollutants, recycling and materials substitution
Dan and Liu (2000)	GSCM is a management mode which considers the environmental effects and the efficiency of resource utilization in the whole supply chain. It is based on the green manufacturing theory and supply chain management techniques, involving suppliers, manufacturers, retailers and consumers. It aims to minimize the negative effects on the environment and to maximize the efficiency of resource utilization in the whole production process.
Zsidisin and Siferd (2001)	GSCM is a supply chain management technique used to solve the environmental problems within a company's production and service departments.
US-Asia Environmental Partnership (2003)	Activities in which an organization imposes its environmental requirements to its suppliers' productions and processes should be named “Green supply chain management”.
United Nations Environment Programme (2003)	The main activities of GSCM include evaluating the suppliers' environmental performance, developing eco-design with suppliers, providing training and information for suppliers in order to improve suppliers' environmental management capabilities
Zhu (2004)	GSCM enterprises cooperate with their downstream and upstream, optimizing the environmental benefits from product design, material selection and retailing to recycling, improving both economic and environmental performances to achieve the sustainable development of supply chain.

Beamon (1999) presented a different green supply chain management definition in a new conceptual model of green supply chain. This model is based on the traditional supply chain conceptual model with the addition of remanufacturing, reuse and recycling. It also described the motion of waste materials which arise from supply, manufacturing, distribution and consumption. So far, the conceptual model of green

supply chain has not involved numerous researchers. With support from the Swedish Office of Science and Technology, Karlberg (2000) offered a conceptual model of green supply chain in the research of green supply chain management within the electronics industry. In this research, reclamer was added as a member of a green supply chain that grouped suppliers, manufacturers, distributors, retailers and consumers, while the motion issues of information flow was investigated in green supply chain. Hoek (1999) also reported a conceptual model of green supply chain, adding service organization as a new element in this model. It has contributed to the analysis of problems and how to manage every pitch point in a green supply chain.

Reviewing the above models, all green supply chain models have been created through expansion of environmental elements into the traditional supply chain system. But, they do not describe the system structure of green supply chain and ignore the motion of knowledge flow in the systems. Traditional supply chain management has been focused on maximizing the enterprises' benefits in supply chain (Thoo *et al.*, 2014a). Although it involved material and energy savings with a simple consideration of cost and internal environment improvement, no sufficient consideration of the impacts on external environment was provided, and the recycling process of wastes was ignored (Thoo *et al.*, 2014b). Table 2 shows the differences between traditional supply chain management and green supply chain management.

**Table 2** Comparisons between SCM and GSCM

Items	SCM	GSCM
Background	Accelerated diversification and uncertainty on market	Environmental degradation and resources shortage
Essential elements	Supplier/ Manufacturer/ Distributor/ Retailer/ Consumer	Supplier/ Manufacturer/ Distributor/ Retailer/ Consumer/ Society and Environment
Primary Activities	Material Flow/ Information Flow/ Capital Flow	Material Flow/ Information Flow/ Capital Flow/ Knowledge Flow
Theoretical Basis	Optimal Allocation of Resources	Supply Chain Management (Optimal Allocation of Resources)/ Sustainable Development (Equity Theory)
Manufacturing Model Strategic Objectives	Lean Production/ Agile Manufacturing Reducing uncertainty and Maximizing benefits	Cleaner Production / Green Manufacturing Optimizing the allocation of resources and compatible with environment

Wang *et al.* (2005) summarized and improved the previous models and offered a new one which is referenced in this study. The model gives a systematic and comprehensive description of green supply chain structure and the connections among subsystems. It divides green supply chain into five subsystems which are manufacturing, consumption, environmental, logistics and social systems. Manufacturing systems consist of suppliers, manufacturers, distributors, retailers and recyclers, covering the whole process beginning with resource investment, and progressing to manufacturing, transportation, marketing and re-use. A consumption system includes consumer activities such as final consumption and product use while the main activities in environmental systems are that of developing resources and recycling waste materials. Social system is comprised of the social factors which impact green supply chain operation such as regulation, culture and ethics. And finally, a logistics system is concerned with material, information, capital and knowledge flows.

In this model, the movement of green supply chain is circular. Environmental systems provide resources to manufacturing systems. Through the behaviours of production and consumption, both the manufacturing system and consuming system release waste materials which enter into the environmental system. Manufacturing systems provide products to consumers and receive resources from recycled consumers' waste products. The social system conducts regulation, culture and ethics to restrict and influence the activities in the manufacturing and consuming system so as to achieve environmental compatibility. The most prominent feature of this model is the presentation of the operation of logistics systems on green supply chains. Due to the involvement of re-use, material flow and capital flow are changed from single movement to double movement, and as a newly imported component part, knowledge flow is added into the green supply chain model.

In recent years, due to the increasingly stringent environmental requirements placed upon social and enterprise development, the green supply chain management researches have made substantial progress (Zhu *et al.*, 2010). Many advanced ideas (e.g., Life Cycle Management and Industrial Ecology) and analytical tools (e.g., Industrial Network Theory, CHAMP Method and ANP Method) have been integrated into green supply chain management (Handfield *et al.*, 2002), and some of them prospered in small-scale practices that achieved a win-win situation between enterprises and society (Hu and Hsu, 2010). However, the research on green supply chain management at present does not keep up with the urgent requirements of its development.

#### ■4.0 GREEN SUPPLIER

In a supply chain, upstream enterprises provide products (materials, semifinished products, components or services) to downstream enterprises, and in turn, downstream enterprises will provide products to their downstream enterprises. Upstream enterprises which provide products to others are termed suppliers, while downstream enterprises which purchase products from others are termed purchasers (Bowersox *et al.*, 2002). Each enterprise is the consumer for their upstream and also a supplier for their downstream (Wisner *et al.*, 2005). Thus, supplier is broadly defined as all the enterprises in supply chain, with the exception of the final consumer.

Suppliers are the source of the entire spectrum of supply chain (Ting and Cho, 2008). Effective supplier management is the prerequisite and foundation of supply chain cooperation (Coyle *et al.*, 2009; Burt *et al.*, 2010). Saman and Jafar (2009) demonstrated that suppliers have played a critical role in, and have had a significant impact on, their partner enterprises' operation and development in many ways such as delivery time, quality level, inventory position, production cost, service quality and product design. Enterprises have been more and more absorbed in their core businesses (Chin *et al.*, 2004). They have purchased much more outsourcing materials than before, leading to much heavier reliance on suppliers for professional techniques and strategic decision-making (Ting and Cho, 2008; Burt *et al.*, 2010). As Amid *et al.* (2011) mentioned, building good partnerships with suppliers and managing suppliers effectively has already been to the key approach to

improving an enterprises' competitive advantage. Thus, supplier management is the main component of supply chain management (Wisner *et al.*, 2005; Coyle *et al.*, 2009).

Simultaneous with green supply chain management, green supplier management has been developed from supplier management, reducing both environmental risks and the difficulty of environmental management for enterprises (Hoek, 1999). The green production achievements of suppliers have been amplified in the process of supply chain activities (Murray, 2000). Qinghua *et al.* (2010) pointed out that green suppliers have contributed to the reduction of product life-cycle cost so as to provide more environmental-friendly, safer and cheaper products to consumers. In addition, Noci (1997) stated that green suppliers have reduced the production costs of their downstream enterprises by allocating the use of resources and raw materials more efficiently, thereby curtailing the expenditure of environmental remediation.

In light of the above, suppliers are an essential part of green supply chains and play a vital role in the implementation of green supply chain management (Hu and Hsu, 2010; Seuring and Müller, 2008). Qinghua *et al.* (2010) suggested that a new and necessary requirement for modern enterprises to survive in global and information-based competition, is to understand the importance, operational modes and process methods of green supplier management. Green supplier management in this study will focus on how enterprises select green suppliers and how to green suppliers are developed.

#### 4.1 Green Supplier Selection

The topic of supplier selection has been broadly researched over the past several decades. Some relevant researches have grown to a mature stage (Feng *et al.*, 2011). Dickson (1966) conducted the earliest and also the most influential research on supplier selection. Through the analysis of survey results from 170 purchasing agencies and managers, he presented 23 supplier evaluation indicators and of these, standard quality, on-time delivery and performance history are the top three most influential factors. Johnson *et al.* (1995) evaluated potential suppliers based on their strategies, cultures, production processes and technologies, and 17 factors were selected as the criteria of suitable suppliers. The results show that in all 17 influential factors, time, cost, quality and service are the successful factors for suppliers. In an empirical study, Patton (1996) reported a set of critical elements in supplier selection and evaluation decisions. It placed in order of importance product quality, price and terms, delivery, sales support, facilities and technology, order routine and financial status. Yahya and Kingsman (1999) adopted the analytical hierarchy process (AHP) to analyse the supplier selection criteria and gave another rating that included delivery, quality, facilities, technical capabilities, management, financial position, discipline and responsiveness.

Glenn (2001) investigated supplier selection in technically innovative enterprises and developed a model to contribute to transaction cost economics from the perspective of supplier selection. Choy and Lee (2003) developed a case-based supplier management tool to select and evaluate suppliers for outsourcing manufacturing, and they proposed a hierarchical structure as a mechanism built around three main criteria (technical capabilities, organizational profiles and quality assessment) including 13 attributes such as, price, delivery, financial status, customer service, quality staff, quality of shipment, planning and assurance of quality, process improving, product developing, manufacturing capabilities, organizational culture, management commitment, objectives of marketing and sales achievements. Kulak and Kahraman (2005) discussed the fuzzy multi-attribute decision-making issues especially in the selection and evaluation of transportation suppliers. They used an approach which combined both multi-attribute axiomatic design (AD) and analytical hierarchy process (AHP) to accomplish the selection process of the best transportation company under the five key criteria including transportation cost, defective rate, tardiness rate, flexibility and documentation abilities.

In general, enterprises need to take multiple factors into account while managing their supply chain and suppliers (Amid *et al.*, 2006). In purchasing services and products, in particular, suppliers are compared and evaluated in detail. From the initial material purchases right down to the delivery of the final product or service, it is necessary to select and manage all kinds of suppliers in each stage of the entire product life cycle (Chen *et al.*, 2004). Thus, the increasing diversities and differences in suppliers have led to a much more complex selection and management process than ever before (Bai and Sarkis, 2010). From the above previous studies, the main criteria of supplier selection includes product quality, product cost, on-time delivery, financial status, production capabilities, service level, technical capabilities, innovation capabilities, ISO 9000 certification, long-term relationships, cultural compatibility, corporate reputation and corporate communication. Most of these criteria focus on operational and organizational factors that are no longer fully adaptable to the needs of today's enterprises (Wu *et al.*, 2001). With increasing pressure arising from a contaminative environment and deficient energy and resources, decisions concerning supplier selection should be based not only on operational and economic benefits, but also upon the comprehensive performance of the economy, environment and society.

In recent years, more and more researches have started to include environmental factors in the process of supplier selection. Noci (1997) pointed out that the supplier selection criteria in different companies depended on their environmental development strategies. Thus, the companies should identify their environmental development strategies before selecting suppliers. As a result, environmental development strategies were clustered into pro-active and re-active, and one supplier rating system was offered based on the pro-active environmental development strategy. The primary criteria include green competency, environmental efficiency, suppliers' green image and net life-cycle cost. Min and Galle (1997) discussed how to consider environmental protection in the decision-making process of supplier selection while they explored the effects of green purchasing on reducing waste. In order to look for the supplier selection criteria and influencing factors which are suitable for the requirements of green supply chain management, Walton *et al.* (1998) analysed the supplier selection criteria with a consideration of environmental elements through research conducted in the US manufacturing industry.

Handfield *et al.* (2002) carried out three case studies to examine the method of analytical hierarchy process (AHP) which was used in the assessment of supplier environmental performance, and put forward an indicator system of supplier environmental performance that resulted in the top 10 most easily and most important assessed indicators. These indicators were composed of a set of supplier environmental performance attributes that involved waste management, product attribute, labelling and certification, packaging and reverse logistics, compliance to government regulates and environmental programs at suppliers' facilities. Gauthier (2005) suggested that sustainability is the simultaneous development of economy, society and environment. In his research, a newly extended LCA (Life Cycle Assessment) method was suggested as a tool to measure corporate social and environmental performance. Presley *et al.* (2007) and Ciliberti *et al.* (2008) provided the "triple bottom line" selection criteria composed of the contribution of economic, environmental, and social dimensions to organizational and managerial decisions. Hutchins and Sutherland (2008) demonstrated how to apply social sustainability measurements to supply chain decision-making, especially in supplier evaluation and selection decisions.

After a comprehensive review of the related work in China, it can be said that China has produced many great achievements and a substantial number of them have been applied into practice. Ma *et al.* (2000) summarized four critical factors which impact partner selection and these factors are organizational performance, business structure and production capacity, system quality and organizational environment. Based on the research of Walton *et al.* (1998), Zhu and Geng (2002) compared the situations of supplier selection in the different green supply chain backgrounds in China and the US. Wang *et al.* (2004) designed an evaluation system for suppliers with six factors involving service, technique, flexibility, quality reliability, delivery reliability and supplier loyalty. Wang and Chen (2004) built a supplier evaluation system suitable for e-business environments which includes four criteria such as degree of informatization, service level, business ability and technical capability.

In a research of green supplier assessment, Wang *et al.* (2007) put forward design principles for an assessment criteria system involving degree of systematization, independence, comparability, dynamism and flexibility. Liu and Zhu (2005) researched decision-making of green supplier selection and examined four influencing factors such as ISO14001 certification, production eco-design, effective clean technologies and current environmental efficiency. Huo *et al.* (2005) created different assessment criteria systems for the three different phases in one supply chain life-cycle such as creating stage, operating stage and dissolution stage. Zhong (2006) summarized current literature and suggested 13 criteria (quality, service, cost, flexibility, financial status, technical level, ability of catching opportunity, level of supply, strategic mindset, management system, cultural capacity, leadership support and cooperate income) for supplier selection based on four aspects involving production, performance, organizational culture and cooperative attitude.

With consideration given to the economic operation of enterprises, as well as social and financial requirements of environmental protection, Zhang (2005) identified three criteria for green partner selection that involve parameters such as performance evaluation, production or service evaluation and environmental indicators. In another similar study, Shi and He (2005) presented seven criteria for supplier selection, especially in agile supply chains, involving product price satisfaction, product manufacturing quality satisfaction, product environmental quality satisfaction, design capability satisfaction, responsiveness to customer demand, synchronous cooperative ability and business credibility. Chen (2007) analysed related theories of supply chain risk management and supplier selection, and built a supplier assessment criteria system which consisted of external risk factors (natural geographical environment, political factors, cultural environment and economic factors), internal risk factors (technical capability, financial status, production condition, management level, business development prospects and after service) and co-related risk factors (cooperative compatibility and delivery status).

Throughout the research status in and out of China, the perception is that the criteria system of supplier selection decision-making has been built in to many researches. Along with the wide-acceptance of sustainable development and environment protection ideas, new selection criteria such as suppliers' social responsibilities and environmental consciousness have become indispensable factors in some researches, leading to more a comprehensive supplier selection criteria system. However, there are still some shortages. The existing green supplier selection studies put more emphasis on environmental issues, and the study of socially sustainable development factors has been very limited so far (Hutchins and Sutherland, 2008).

On the other hand, many researches have analysed environmental or social factors as exogenous variables in order to solve some specific environmental or social problems in supply chain. They have independently studied suppliers' environmental or social performance and little consideration has been given to the economy, environment and society as a whole. Thus, it is lack of greening the whole supplier selection process.

## 5.0 CONCLUSION

From the previous literature discussed in this study, it can be concluded that green supply chain is the expansion of traditional supply chain. It focuses on environmental elements as the basis of achieving the objectives of supply chain management. Through the recycling of products, the utilization ratio of system resources will be improved and negative impacts on the environment will be reduced. Green supply chain management aims to promote the coordinated development of environmental, social and economic performances with an emphasis on green transformation of the whole product life cycle while minimizing resource consumption and environmental impact and at the same time, pursuing economic benefits. Thus, green supply chain is more systemic, holistic and practical by including green supplier selection.

## Acknowledgement

The work is financed by Zamalah /Institutional Scholarship provided by Universiti Teknologi Malaysia and the Ministry of Higher Education of Malaysia.

## References

- Allen, H. H. and Chia, W. H. (2010). Critical factors for implementing green supply chain management practice: An empirical study of electrical and electronics industries in Taiwan. *Management Research Review*, 33(6), 586–608.
- Amid, A., Ghodspour, S.H. and O'Brien, C. (2006). Fuzzy multi-objective linear model for supplier selection in a supply chain. *International Journal of Production Economics*, 104(2), 394–407.
- Amid, A., Ghodspour, S.H. and O'Brien, C. (2011). A weighted max–min model for fuzzy multi-objective supplier selection in a supply chain. *International Journal of Production Economics*, 131, 139–145.
- Arena, U., Mastellone, M. L. and Perugini, F. (2003). The environmental performance of alternative solid waste management options: A life-cycle assessment study. *Chemical Engineering Journal*, 96, 207–222.
- Bai, C.G. and Sarkis, J. (2010). Green supplier development: analytical evaluation using rough set theory. *Journal of Cleaner Production*, 18(12), 1200–1210.
- Beamon, B. M. (1999). Designing the green supply chain. *Logistics Information Management*, 12(4), 332–342.
- Bowersox, D. J., Closs, D. J. and Cooper, M. B. (2002). *Supply Chain Logistics Management*, Boston, MA: McGraw-Hill/Irwin.
- Burt, D. N., Petcavage, S. D. and Pinkerton, R. L. (2010). *Supply Management*, 8<sup>th</sup> ed., New York: McGraw-Hill/Irwin.
- Chen, I.J., Paulraj, A. and Lado, A. (2004). Strategic purchasing, supply management, and firm performance. *Journal of Operations Management*, 22, 505–523.
- Chen, X. (2007). A study on strategic supplier selection: based on supply chain risk management. *Journal of Hohai University*, 9(1), 24–28.

- Chin, K.S., Tummala, V.M., Leung, P.F. and Tang, X.Q. (2004). A study on supply chainmanagement practices: The Hong Kong manufacturing perspective, *International Journal of Physical Distribution & Logistics Management*, 34(6), 505–524.
- Choy, K.L., and Lee, W.B. (2003). Ageneric supplier management tool for outsourcing manufacturing. *Supply Chain Management: An International Journal*. Vol. 8 No. 2, pp. 140-154.
- Christmann, P. (2000). Effects of “best practices” of environmental management on costadvantages: the role of complementary assets. *Academy of Management Journal*, 43(4), 663–680.
- Ciliberti,F., Pontrandolfo, P. andScozzi, B. (2008). Logistics social responsibility: Standard adoption and practices in Italian companies. *International Journal of Production Economics*, (1131), 88–106.
- Clemens, B. (2001). Changing environmental strategies over time: An empirical study of the steel industry in the United States. *Journal of Environmental Management*, 62(2), 221–231.
- Cote, R. P., Lopez, J., Marche, S., Perron, G. M. and Wright, R. (2008). Influences, practices and opportunities forenvironmental supply chain management in Nova Scotia SMEs. *Journal of Cleaner Production*, 16(15), 1561–1570.
- Coyle, J.J., Langley, C.J., Gibson, B.J., Novack, R.A. and Bardi, E.J. (2009). *Supply Chain Management: A Logistics Perspective*, 8<sup>th</sup> ed., Mason, OH: South-Western Cengage Learning.
- Craig, R. C. and Dale, S. R. (2008). A framework of sustainable supply chain management: moving toward new theory. *International Journal of Physical Distribution & Logistics Management*, 38(5), 360–387.
- Dan, B. and Liu, F. (2000). Study on green supply chain and its architecture. *Journal of the Chinese Society of Mechanical Engineers*, 11, 1232–1234.
- Dickson, G. (1966). An Analysis of Vendor Selection Systems and Decisions, *Journal of Purchasing*, 2(1), 5–17.
- Dowell, G., Hart, S. and Yeung, B. (2000). Do corporate environmental standards create or destroy market value? *Management Science*, 46(8), 1059–1074.
- Farrow, P. H., Johnson, R. R. and Larson, A. L. (2000). Entrepreneurship, innovation, and sustainability strategies at Walden Paddlers, Inc. *Interfaces*, 30(3), 215–225.
- Feng, B., Fan, Z.P. and Li, Y. (2011). A decision method for supplier selection in multi-service outsourcing, *International Journal of Production Economics*, 132, 240–250.
- Fitzherbert, E. B., Struebig, M. J., Morel, A., Danielsen, F., Bruhl, C. A., Donald, P. F. and Phalan, B. (2008). How will oil palm expansion affect biodiversity? *Trends in Ecology and Evolution*, 23(10), 538–545.
- Gauthier, C. (2005). Measuring corporate social and environmental performance: the extendedlife-cycle assessment, *Journal of Business Ethics*, 59(1), 199–206.
- Glenn, P. H. (2001). *The Role Of Technical And Relational Capabilities In The Selectionof Suppliers For Technically Innovative Components In The U.S. And Japan*. Ph.D. Thesis. Universityof Michigan Business School, Michigan.
- Green, K., Morton, B. and New, S. (1998). Green purchasing and supply policies: do they improve companies’ environmental performance? *Supply Chain Management*, 3(2), 89–95.
- Green, K., Morton, B. and New, S. (2000). Greening Organizations: Purchasing, Consumption, and Innovation. *Organization Environment*, 13(2), 206-225.
- Greenpeace (2007). *How The Palm Oil Industry Is Cooking The Climate*. Amsterdam: Greenpeace International.
- Handfield, R. B., Walton, S. V., Lisa, K. S. and Melnyk, S. A. (1997). Green value chain practices in the furniture industry. *Journal of Operations Management*, 15(4), 293–315.
- Handfield, R. B., Walton, S. V., Sroufe, R. and Melnyk, S. A. (2002). Applying environmental criteria to supplier assessment: a study in the application of the analytical hierarchy process. *European Journal of Operational Research*, 141(1), 70–87.
- Hoek, R. I. (1998). “Measuring the unmeasurable”-measuringand improving performance in the supply chain. *Supply Chain Management: An International Journal*, 3(4), 187–192.
- Hoek, R. I. (1999). From reversed logistics to green supply chains. *Supply Chain Management: An International Journal*, 4(3), 129–134.
- Hu, A. H. and Hsu, C. W. (2010). Critical factors for implementing green supply chain management practice: An empirical study of electrical and electronics industries in Taiwan. *Management Research Review*. 33(6), 586–608.
- Huo, J.Z., Ma, X.B. and Zhu, L.J. (2005). *Integrated supply chain performance evaluation system and application*, Beijing: Tsinghua University Press.
- Hutchins, M.J. and Sutherland, J.W. (2008). An exploration of measures of social sustainability and their application to supply chain decisions, *Journal of Cleaner Production*, 16(15), 1688–1698.
- Jamal, F. (2009). Green Supply Chain Management: A Literature Review. *Otago Management Graduate Review*. 7, 51–62.
- Johnson, M., Meade, L. and Rogers, J. (1995). Partner selection in the agileenvironment. *Proceedings of the 4<sup>th</sup> Annual Agility Forum Conference*. 496–505.7-9, March. Atlanta, GA.
- Karlberg, T. (2000). *Supply Chain Environmental Management*. Stockholm: Swedish Office of Science and Technology.
- Kulak, O., and Kahraman, C. (2005). Fuzzy multi-attribute selection among transportation companies using axiomatic design and analytic hierarchy process. *Information Sciences*, 170, 191–210.
- Lee, S. Y. (2008). Drivers for the participation of small andmedium-sized suppliers in green supply chain initiatives. *Supply Chain Management: An International Journal*, 13(3), 185–198.
- Liu, B. and Zhu, Q.H. (2005). Supplier selection: based on green purchasing model. *Journal of Chinese Management Review*, 4(1),. 30–36.
- Ma, S.H., Lin, Y. and Chen, Z.X. (2000). *Supply Chain Management*, 1<sup>st</sup>ed., Beijing: China Machine Press.
- Meisner, R. C., Bercovitz, J. and Beckman, S. (2008). Environmental supply-chain management in the computer industry: a transaction cost economics perspective. *Journal of Industrial Ecology*, 4(4), 83–104.
- Min, H. and Galle, W. P. (1997). Green Purchasing Strategies: Trends and Implications. *International Journal of Purchasing & Materials Management*, 33(3), 10–17.
- Min, H. and Galle, W. P. (2001). Green Purchasing Practices of US Firms. *International Journal of Operations & Production Management*, 21(9), 1222–1238.
- Min, H., Ko, H. J. and Ko, C. S. (2006). A genetic algorithm approach to developing the multi-echelon reverse logistics network for product returns. *Omega*, 34, 56–69.
- Murray, J. G. (2000). Effects of a green purchasing strategy: the case of Belfast City Council. *Supply Chain Management: An International Journal*, 5(1), 37–44.
- Nagorney, A. and Toyasaki, F. (2005). Reverse supply chain management and electronic waste recycling: A multi-tiered network equilibrium framework for e-cycling. *Transportation Research Part E: Logistics and Transportation Review*, 41, 1–28.
- Narasimhan, R. and Carter, J. R. (1998). *Environmental Supply Chain Management*. Center for Advanced Purchasing Studies, Tempe, AZ.
- Nathalie, F. C., Christine, R. and Jacques, C. (2011). Future sustainable supply chains: what should companies scan? *International Journal of Physical Distribution & Logistics Management*, 41(3), 228–252.
- Noci, G. (1997). Designing green vendor rating systems for the assessment of a supplier’s environmental performance. *European Journal of purchasing & supply management*, 3(2),.103–114.
- Patton, W.E. (1996). Use of human judgment models in industrial buyers’ vendor selection decisions. *Industrial Marketing Management*, 25(2), 135–149.
- Piplani, R., Pujawan, N. and Ray, S. (2008). Sustainable supply chain management. *International Journal of Production Economics*, 111(2), 193–194.
- Presley, A., Meade, L. and Sarkis, J. (2007). A strategic sustainability justification methodology for organizational decisions: are verse logistics illustration. *International Journal of Production Research*, 45(18-19), 4595–4620.
- Qinghua, Z., Yijie, D., and Joseph, S. (2010). A portfolio-based analysis for green supplier management using the analytical network process. *Supply Chain Management: An International Journal*, 15(4), 306–319.
- Saman, H. A. and Jafar, R. (2009).An integrated fuzzy model for supplier management: A case study of ISP selection and evaluation, *Expert Systems with Applications*, 36(4), 8639–8648.
- Sarkis, J. (Ed.) (2001). *Greener Management International*. Sheffield: Greenleaf Publishing.
- Sarkis, J., Meade, L. and Presley, A. (2006). An activity based management methodology for evaluating business processes for environmental sustainability. *Business Process Management Journal*, 12(6), 751–776.
- Seuring, S. and Müller, M. (2008). From a literature review to a conceptual framework for sustainable supply chainmanagement. *Journal of Cleaner Production*, 16(15), 1699–1710.

- Sharma, S. (2000). Managerial interpretations and organizational context as predictors of corporate choice of environmental strategy. *Academy of Management Journal*, 43(4), 681–697.
- Shi, S.L. and He, J.S. (2005). A study on supplier assessment system in agile supply chain, *Journal of the Chinese Institute of Industrial Engineers*, 8(2), 95–100.
- Shih, L. (2001). Reverse logistics system planning for recycling electrical appliances and computers in Taiwan. *Resources, Conservation, and Recycling*, 32, 55–72.
- Simpson, D. F. and Power, D. J. (2005). Use the supply relationship to develop lean and green suppliers. *Supply Chain Management: An International Journal*, 10(1), 60–68.
- Srivastava, S. K. (2007). Green supply-chain management: a state-of-the-art literature review. *International Journal of Management Reviews*, 9(1), 53–80.
- Srivastava, S. K. and Srivastava, R. K. (2006). Managing product returns for reverse logistics. *International Journal of Physical Distribution and Logistics Management*, 36, 524–546.
- Svensson, G. (2007). Aspects of sustainable supply chain management (SSCM): conceptual framework and empirical example. *Supply Chain Management: An International Journal*, 12(4), 262–266.
- Thoo, A. C., Hamid, A. B. A., Rasli, A. and Zhang, D. W. (2014a). Supply Chain Strategy and Operational Capability in Malaysian SMEs. *Advances in Education Research*. 44, 231.
- Thoo, A. C., Hamid, A. B. A., Rasli, A. and Zhang, D. W. (2014b). The Moderating Effect of Entrepreneurship on Green Supply Chain Management Practices and Sustainability Performance. *Advanced Material Research*. 869, 773–776.
- Ting, S.C. and Cho, D.I. (2008). An integrated approach for supplier selection and purchasing decisions, *Supply Chain Management: An International Journal*, 13(2), 116–127.
- UNEP. (2003). *United Nations Environment Program*. from <http://www.unepie.org/pc/pc/tools/supplychain.com>.
- US-AEP. (2003). *The United States-Asia Environment Partnership*. from <http://www.usaep.org/programmms/industry/ind-greening.html>.
- Vasileiou, K. and Morris, J. (2006). The sustainability of the supply chain for fresh potatoes in Britain. *Supply Chain Management: An International Journal*, 11(4), 317–327.
- Walker, H., Sisto, L. D. and McBain, D. (2008). Drivers and barriers to environmental supply chain management practices: Lessons from the public and private sectors. *Journal of Purchasing & Supply Management*, 14(1), 69–85.
- Walton, V. S., Handfield, R. B. and Melnyk, S. A. (1998). The green supply chain: integrating suppliers into environmental management process. *Journal of Supply Chain Management*, 34(2), 2–11.
- Wang, C.Q. (2004). *Green Logistics*, Chemical Industry Press, Beijing.
- Wang, N. M., Sun, L. Y. and Wang, Y. L. (2005). *Green Supply Chain Management*, Tsinghua University Press, Beijing.
- Wang, N. M., Yang, T. and Qiao, J. M. (2007). Study on Green Supply Chain Management. *Industrial Engineering Journal*, 10(1), 11–17.
- Wang, X.P. and Chen, A. (2004). Supplier Evaluation and Optimization: Based on E-business. *Chinese Journal of Management Science*, 17(4), 49–52.
- Webb, L. (1994). Green Purchasing: Forging a New Link in the Supply Chain. *Resource*, 1(6), 14–18.
- Wisner, J.D., Tan, K.C. and Leong, G.K. (2005). *Principles of supply chain management: a balanced approach*, 2<sup>nd</sup> ed., Mason, OH: South-Western Cengage Learning
- Wu, C. Y., Zhu, Q. H. and Geng, Y. (2001). Green supply chain management and enterprises sustainable development. *China Soft Science*, 3, 47–50.
- Yahya, S. and Kingsman, B. (1999). Vendor Rating for an Entrepreneur Development Programme: A Case Study Using the Analytic Hierarchy Process Method. *The Journal of the Operational Research Society*, 50(9), 916–930.
- Zhang, D. W., Hamid, A. B. A. and Thoo, A. C. (2014). Sustainable Supplier Selection: An International Comparative Literature Review for Future Investigation. *Applied Mechanics and Materials*. 525, 787–790.
- Zhang, P. (2005). Cooperative partner evaluation and selection in green supplier management, *Journal of Value Engineering*, 2(1), 44–46.
- Zhong, M.M. (2006). An empirical study on supplier selection, *Journal of Hohai University*, 3(1), 9–15.
- Zhu, Q. and Sarkis, J. (2004). Relationships between operational practices and performance among early adopters of green supply chain management practices in Chinese manufacturing enterprises. *Journal of Operations Management*, 22(3), 265–289.
- Zhu, Q. H. (2004). *Green Supply Chain Management*. Chemical Industry Press, Beijing.
- Zhu, Q., Geng, Y., Tsuyoshi, F. and Shizuka, H. (2010). Green supply chain management in leading manufacturers: Case studies in Japanese large companies. *Management Research Review*, 33(4), 380–392.
- Zhu, Q.H. and Geng, Y. (2002). Organizational Green Procurement, *China Soft Science*, 11(1), 71–74.
- Zsidisin, G. A. and Siferd, S. P. (2001). Environmental purchasing: a framework for theory development. *European Journal of purchasing & Supply Management*, 7(1), 61–73.