

# Sustainable Supply Chain Management as a Strategic Tool for Competitive Advantage in Tea Industry in Kenya

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## Abstract

It is assumed that companies that utilize sustainable supply chain management as a strategic tool in business management are likely to have a competitive edge over others. However, this is contrary to the Tea Industry in Kenya. The main purpose of this research was to establish the role of sustainable supply chain management as a strategic tool for competitive advantage in the tea industry in Kenya. The specific objective was to find out to what extent the supply chain collaborative strategy as a tool for competitive advantage is used by the companies in tea industry in Kenya. The mixed research design was used in the study. The target population was the tea companies in Kenya and the sample of eight Tea Companies were purposively selected for the study. Data collection was done by use of both structured questionnaires and oral interview to get the primary data while the secondary data was obtained by documentary analysis. The results finding indicated that sustainable supply chain management as a strategic tool contributes to the competitive advantage of Kenyan tea companies in the global market. The results provide information to the tea companies to come up with sustainable strategies in their supply chain management in order ensure the Kenyan tea remains competitive in the global market.

**Keywords:** supply chain management, tea industry, strategic tools

## 1. Introduction

With globalization, there has been an increasing interdependence across national and geographical boundaries of people. The intensity of competition has increased tremendously and there has been growing demands for flexible and cost efficient systems that can support customer differentiation. There are increasingly complex consumer demands, changing global regulatory regimes and increased concerns over products safety and security. Import restrictions have been put on the companies that fail to manage sustainably its supply chain and with the emergence of new types of inter-organizational relationships.

Companies have entered in to a new era of understanding the dynamics of competitive advantage and the role played by supply chain management (Premkumar et al., 2006). Supply chain management has become increasingly crucial due to fewer companies being vertically integrated, increased competition, the increased realization of the effect that one entity has on the entire supply chain, greater emphasis on flexibility, and the need to produce new products more quickly (Lumms, 1999). Supply chain management (SCM) approach is progressively recognized by many organizations as a strategy to attain their business goals today (Chin et al., 2004; Altekar, 2005). Enhancing supply chain performance is a critical approach for achieving competitive advantages for companies (Cai, Xiao, & Liu, 2009).

Environmental degradation, global poverty, lack of human rights, far-reaching health deficits and corporate governance resulted in sustainable supply chains management (SSCM) to emerge as key enabler that could push organization to focus on alleviating environmental issues, providing economic and social benefits (Govindasamy, 2010). Through sustainable supply chain management, companies can realize significant additional profits by acting within the triple sustainable issues of social, environmental and economic.

In tea industry, the demand from customers is always variable or changing which is hard to anticipate and Customers are used to requiring products in a short time frame whenever they increase demands without prior alignment with the company. This means that companies have no power to shape the relationship with the supplier and must accept quality, price decision and terms and conditions that are dictated by the supplier (Cox

et al., 2003). A closer relationship enables the participating companies to achieve cost reductions and revenue enhancements as well as flexibility in dealing with supply and demand uncertainties (Bowersox, 1990; Lee et al., 1997).

### *1.1 Tea Industry in Kenya*

The tea (*Camelia sinensis*) was introduced in Kenya by Caine, G. W who was European settler. Caine planted the first seedling in Limuru near Nairobi as early in 1903 (Tea Board of Kenya, 2010). Kenya is the third major producer and the key exporter of tea in the world at twenty three percent (23%) of the total tea produced in the world (Tea Board of Kenya, 2010). The power in the Global tea industry is concentrated in the hands of four trans-national corporations (TNCs) of which two are actively involved in tea industry in Kenya. These companies include Unilever and James Finley. Other companies in Kenya that are in tea industry include Vanrees Company, Ketepa Company Ltd and Lab International. Benoit & Peter (2002) asserts that these TNCs invest more in branding and marketing at the expense of transformation in production and labor processes and their goal is to maximize the profits even if this requires downsizing the workforce.

The Kenyan tea is majorly grown in the areas that are endowed with ideal climate that has tropical volcanic red soils. The rainfall distribution in this areas ranges between 1200mm to 1400mm per annum. Farmers in this area apply fertilizers in their tea farms to replenish soils (Tea Board of Kenya, 2010). The tea production in Kenya is undertaken by large scale sector and the small scale sector. The large scale sector is owned by large scale tea producers and companies mostly multinationals while the small holder sector is owned by local small scale growers. These Small scale holders produce and sell their tea through the Kenya Tea Development Agency which is the largest single tea agency in the globe with sixty two tea factories (Daily Nation, Sunday 25 April 2010). Small scale farmers use family labor in planting, plucking and delivery to collection centers.

## **2. Literature Review**

### *2.1 Strategic Supply Chain Management*

Strategy is the direction and the scope of an organization over the long term which achieves advantage for the organization through its configuration of resources within a changing environment and to fulfill stakeholder expectations (Lysons et al., 2012). A strategy is an important tool required by any organization to create and sustain a competitive edge over other business through people. It enables it to ensure day-to-day decisions fit in with the long- term interest of an organization beside encouraging every member of the organization to work together to achieve common aims. It is equally important in serving both external and internally customers.

A company's competitive strategy defines relative to its competitors, the set of customer needs that it seeks to satisfy through its products and services. The companies are re-engineering their supply chain in order to gain competitive advantage in the world changing markets. Supply chain has its roots in Porter's (1985) value chain which is the set of processes a firm uses to create value for its customers. Christopher (1998) defines supply chain as the network of organizations that are involved through upstream and downstream linkages in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer. The chain involves two or more legally separated organizations that are linked together by material, information or financial flows and includes the ultimate customer.

Many companies are now securing cost, quality, technology and other competitive advantages as strategies to pursue in a globally competitive environment. And to achieve this, they are focusing on their supply chain management practices (Goh & Pinaikul, 1998). Supply chain management is an important multi-disciplinary topic in modern business management and research that ensure that a company enhances their productivity and profitability through a revolutionary philosophy to managing the business with sustained competitiveness (Gunasekaran et al., 2004).

Scott & Westbrook (1991) describe supply chain management as the chain linking each element of the manufacturing and supply process from raw materials through to the end user, encompassing several organizational boundaries and treating all organizations within the value chain as a unified virtual business entity. Supply chain management focuses on how firms utilize their suppliers' processes, technology and capability to enhance competitive advantage (Farley, 1997). Since satisfying customer needs is the central purpose of any business (Doyle, 1994). It seeks to improve performance through better use of internal and external capabilities in order to create a seamlessly coordinated supply chain, thus elevating inter-company competition to inter-supply chain competition (Christopher, 1996).

## 2.2 Supply Chain Collaboration Practice

Collaborative practices have shown to deliver a wide range of benefits which enhance competitiveness and performance in terms of better cost management, improved time, improved resource and risk management and delivering incremental business value and innovation (Lysons et al., 2012). Handfield et al. (2005) argue that without a foundation of effective supply chain relationships, any effort taken to manage the flow of information or materials in a supply chain is likely to be unsuccessful. Supply chain collaborative practice is multi-dimensional and it involves all parties in the supply chain who work together and with external partners to ensure they give value to ultimate customers. It involves the integration of key business processes in a supply chain. Collaboration occurs when companies in the supply chain set common goals and works jointly to achieve the overall goals of supply chain performance and ensures that they add value to their ultimate customer.

Supply chain collaboration call for organizations in the supply chain to exchange resources and information among chain partners. Risks, profits and losses are shared fairly among the chain members. Collaboration can be understood as a form of co-operative inter-organizational relationships, which are socially contrived mechanisms for collective action (Ring & van de Ven, 1992). This co-operation can be achieved through either collaboration or compliance (Hardy et al. 1998). Stank et al. (2001) propose that supply chain collaboration is the construct of coordination, participation and joint problem solving between supply chain partners. Supply chain collaboration can help in the coordination in supply chain. Chopra & Meindl (2010) opines that supply chain coordination occurs when all the different stages of supply chain work toward the objective of maximizing total supply chain profitability rather than each stage devoting itself to its own profitability.

## 2.3 Information Sharing Practice

Information sharing has been shown to offer a central enabler of effective supply chain management (Mentzer, 2004, Moberg et al., 2002). The sharing of information such as inventory levels, forecasting data and sales trends enables the companies to reduce cycle times, fulfill orders more quickly, cut out millions of dollars in excess inventory and improve forecast accuracy. Information flow in any supply chain helps to coordinate the physical flows and the interdependencies amongst the organizations in the supply chain (Shah, 2009). The extent of information sharing in a supply chain is expanding and even the possibility of sharing information among competitors has been discussed (Lee & Whang 2000). Sharma & Bhagwat (2006) argues that the flow of information in an organization is the blood life of any business operating unit irrespective of its size.

Supply chain partners can achieve the benefits of sharing of information through the integration of their systems. Information integration refers to sharing of pertinent information among the members that could influence the actions and performance of the other supply chain members in a supply chain (Lee & Whang, 2001). Information provides the visibility needed to make decisions that improve the Company overall supply chain performance (Chopra & Meindl, 2010). Information sharing between the buyer and vendor in the supply chain has been considered as useful strategies to remedy the so-called bullwhip and to improve supply chain performance (Lee et al., 1997). Quality of information sharing encompasses the accuracy, timeliness, adequacy and the credibility of the information shared (Moberg et al., 2002).

There are a number of new emerging technologies available to connect the members of a supply chain to support information sharing. Information Communication technologies have contributed to the evolving of e-business and e-commerce. E-commerce is the exchange of information across electronic networks at any stage in the supply chain whether within an organization, between businesses or business and consumers or between the public and private sector, whether paid or unpaid (United Kingdom Cabinet office, 1999). Information communication technologies can have a considerable part to play in a competitive strategy.

Supply Chain Management relies heavily on information technology to optimize information and products flows among the processes and business partners within the supply chain. The appropriate use of information systems and information technology can lower the administrative costs of the organization. Information technology such as Enterprise Resource Planning systems allow information to be shared seamlessly between members of a supply chain. Information Technologies can also act as a tool to differentiate a product in terms of quality of service and responsiveness to the customer requirements.

## 2.4 Green Supply Chain Management Theory

Green supply chain management has emerged as an important organizational philosophy to achieve corporate profit and market share objectives by lowering the environmental risks and impacts while raising the ecological efficiency in the organizations and their partners (Van Hock & Erasmus, 2000). Zhu et al. (2005) suggested that to stay competitive in the market, the managers should improve their environmental compliance which has been

setup by the authority, addressing the environmental concern of the customer and mitigate the environmental impact of their products and services. Manufacturing companies are differentiating themselves by developing green supply chain networks within their organizations and also with their customers and suppliers. Allen (2010) asserts that greening the supply chain ultimately leads to competitiveness and economic performance.

The rise in greenhouse emissions and pollution of the environments by firms has precipitated the need for organizations to realign their supply chain operations with a view of conserving the scarce resources. Environmental issues have been increasingly integrated into international trade and consumers worldwide are increasingly demanding environmentally friendly products (Anbumozhi & Kanda, 2005).

The manufacturing companies have shifted their environmental management approaches from just the end-of-pipe control and treatment of waste to the one that embraces avoidance of environmental harm through entire product life cycle (Handfield et al., 2005). These requires a comprehensive means to reduce pollution through identification and eliminating the sources of pollution at every stage of the product life cycle that include raw material extraction, transportation, manufacturing, product use, recycling, and disposal (Matos & Hall, 2007).

The Manufacturing companies have incorporated green supply chain initiatives such as of green procurement, green manufacturing and reverse logistics to help in eliminating waste along entire value streams. Green procurement is an environmentally-conscious purchasing initiative that tries to ensure that the purchased products or materials meets environmental objectives set by the purchasing firm that involves the reduction, reuse and recycling of materials in the process of purchasing (Salam, 2008). Procurement or supply chain managers are now considering the issues of sustainability in their purchasing of inputs in addition to the traditional purchasing criteria of cost, quality and delivery (Lambert & Cooper, 2000). For them to ensure green manufacturing, companies are now using inputs with relatively low environmental impact that are highly efficient and the one that generate little or no waste in their production processes.

Green manufacturing can lead to lower raw material costs, production efficiency, reduced environmental and occupational safety expenses and improved corporate image (Atlas & Frorida, 1998). It is designed to minimize the environmental impact in the manufacturing processes of products (Tan et al., 2002). Firms can effectively practice green manufacturing practices through the use of solar energy, recycling of raw materials and utilize biodegradable energy sources in their manufacturing operations (Amemba et al., 2013). While reverse logistics focuses mainly on the return or take-back products and materials from the point of consumption to the forward supply chain for the purpose of recycling, reuse, remanufacture, repair, refurbishing, or safe disposal of the products and materials (Carter & Ellram, 1998).

### *2.5 Supply Chain Integration Theory*

The concept of supply chain integration originally stems from the notion of vertical integration and this leads to the conventional definition of supply chain integration as a uni-dimensional construct (Akkermans et al., 1999). Stonebraker & Liao (2004) argue that instead supply chain integration should be seen as a continuous and multi-dimensional variable.

Integration is a process of interaction and collaboration in which companies in a supply chain work together in a cooperative manner to achieve mutually acceptable outcomes (Pagell, 2004; Christopher, 1998). Power (2005) asserts that integration involves the cooperation, collaboration, information sharing, trust, partnerships, shared technology and a fundamental shift away from managing individual functional processes to managing integrated chains of processes. Kwon & Suh (2004) consider supply chain integration to be a strategic tool that aims to reduce costs and thus increase customer and shareholder value. Effective integration has been proposed to involve mutual understanding, a common vision, shared resources and achievement of collective goals (Kahn & Mentzer, 1996). Growth of information technology and communication capabilities enhances the ability to integrate the supply chain (Stank et al., 2001).

The major challenge in supply chain integration is to coordinate activities across the supply chain so that the enterprise can improve performance by reducing costs, increasing service levels, reducing the bullwhip effect, better utilization of resources and effectively responding to changes in the market place (Simchi-Levi et al., 2009). Chopra & Meindl (2010) argues that supply chain coordination occurs when all the different stages of supply chain work toward the objective of maximizing total supply chain profitability rather than each stage devoting itself to its own profitability.

### 3. Research Methodology

#### 3.1 Research Design

This study employed a research design of a mixed methodology. This methodology takes advantage of both the qualitative and the quantitative paradigms and reduces the limitations that are likely to be derived from a single methodological design (Bryman, 1996). A survey research design was incorporated in this study to investigate population by selecting samples to analyze and discover occurrences. Descriptive survey enables the collection of information from a larger number of people in a relatively short time hence yields both qualitative and quantitative information (Kothari, 2009; Nachmias et al., 2008). Descriptive survey help to identify attributes of a large population from a group of small individuals (Patton, 2002). It can be used when collecting information about people's attitudes, opinions, habits or any of the variety of education or social issues (Orodho & Kombo, 2002).

#### 3.2 Research Instruments

A multi-methods approach or method triangulation (Decrop, 1999) was used in the study. This entailed the use of a combination of research instruments that includes interviews schedules, questionnaires guides, non-participant observation, and secondary data analysis. This mix of sources allowed for additional cross-checking of the findings in order to evaluate their internal consistency and to increase reliability.

#### 3.3 Sampling Technique and Sample Size

The researcher employed a purposive sampling technique to identify and select eligible participants for the study. Purposive sampling allows the researcher to use cases that have the required information with respect to the objectives of his or her study (Mugenda, 2008). It can be used with both quantitative and qualitative studies (Kombo & Tromp, 2011). The target population was all the tea companies in Kenya and the sample size of eight Tea Company was conveniently purposively selected for the study. The study involved all the supply chain officers/ procurement officers and the Tea factory managers of the selected companies in Kenya.

#### 3.4 Data Processing and Analysis

The researchers examined all the questionnaires for completeness and consistency and then categorize all the items before coding. The collected data was analyzed using SPSS version 20 (Statistical Package for Social Science) as the researcher obtained data using a standard questionnaire. Quantitative technique was used to code qualitative data. Trochim (2004) asserts that qualitative data can be coded quantitatively without detracting from the qualitative information. Descriptive statistics was used to examine the characteristics of the population. The null hypothesis was tested by use of F- ratio using a two way Fisher's Analysis of Variance [ANOVA] on assumption of the homogeneity of the variance of the sample that is normally distributed at 95% confidence interval. This was a two tail test with a sampling error of 5%. Kendall's Coefficient of Concordance (W) was used to measure the degree of association among several K set of ranking of N objects. This is non-parametric test and hence appropriate to measure variables with ordinal or nominal scales with three or more set of rankings. The Spearman's Coefficient of correlation (r) was used to measure the degree of association between the pair of rankings N objects

### 4. Data Analysis

Analysis shows that the coefficient of determination ( $R^2$ ) is equal to 0.698 that is supply chain collaboration management practice; supply chain sustainability management practice explains 69.8 percent of the competitive advantage of Kenyan tea leaving only 30.2 percent unexplained. The P- value of 0.05 implies that the Kenyan Tea competitiveness is significant at the 5% level of significance. Out of eight sampled tea companies, 62.5% have developed mechanisms to minimize child labour in their supply chain; 25% pay their suppliers and staffs in time; 25% give priority to local organizations, marginalized groups and SME's to supply other goods to the company. Only 37.5% of the companies are actively involved in the corporate social responsibility despite 87.5% of companies being members of rainforest alliance or having certification from ethical tea partnership.

### 5. Conclusions

The study used regression analysis to investigate the association between supply chain collaboration practice, supply chain sustainability management practice and the competitiveness of the Kenyan Tea which was found significant with ( $R^2 = 0.698$ ). It was established that the relationship between the competitiveness of Kenyan Tea and supply chain collaboration practice was very strong at 0.732 and moderately strong with supply chain sustainability management practice at 0.578. Kenyan tea companies should continuously incorporate the sustainability management practices in their supply chain for them to remain competitive in the global market.

This may include the companies collaborating with their suppliers and customers in information sharing and demand planning. The Kenyan tea companies need to improve in their supplier's relationship management and engage the suppliers in product design and collaborative transportation. They should effectively practice green manufacturing practices through the use of solar energy, recycling of raw materials and utilize biodegradable energy sources in their operations.

## References

- Akkermans, H., Bogerd, P., & Vos, B. (1999). Virtuous and vicious cycles on the road towards international supply chain management. *International Journal of Operations and Production Management*, 19(5), 565–581. <http://dx.doi.org/10.1108/01443579910260883>
- Altekar, R. V. (2005). *Supply chain management: Concepts and cases*. New Delhi: Prentice Hall.
- Amemba, C. S. (2013). Green Supply Chain best Practices in Hospitality Industry in Kenya. *Global Journal of Commerce and Management Perspective*, 2(3), 7–18.
- Amemba, C. S., Nyaboke, P. G., Osoro, A., & Mburu, N. (2013). Elements of Green Supply Chain Management. *European Journal of Business and Management*, 5(12), 51–61.
- Anbumozhi, V., & Kanda, Y. (2005). *Greening the production and supply chains in Asia: Is there a role for voluntarily initiatives?* IGES Kansai Research Center Discussion Paper, No. 6E. Retrieved from <http://www.iges.or.jp>
- Atlas, M., & Florida, R. (1998). Green manufacturing: *Handbook of Technology Management*. Retrieved from <http://creativeclass.com/rfcgdb/articles/13%20Green%20Manufacturing.pdf>
- Birou, L. M., Fawcett, S. E., & Magnan, G. M. (1998). The product life cycle: A tool for functional strategic alignment. *International Journal of Purchasing and Materials Management*, 34(2), 37–51. <http://dx.doi.org/10.1111/j.1745-493X.1998.tb00047.x>
- Bowersox, D. J. (1990). The strategic benefits of logistics alliances: *Harvard Business Review*, 68(4), 36–43.
- Bryman, A., & Cramer, D. (1996). *Quantitative Data Analysis with Minitab: A guide for Social Scientists*. United Kingdom: Amazon.
- Cai, J., Liu, X., Xiao, Z., & Liu, J. (2009). Improving supply chain performance management: A systematic approach to analyzing iterative KPI accomplishment. *Decision Support Systems*, 46, 512–521. <http://dx.doi.org/10.1016/j.dss.2008.09.004>
- Carter, C. R., & Ellram, L. M. (1998). Reverse logistics: A review of the literature and framework for future investigation. *Journal of Business Logistics*, 19(1), 85–102.
- Chopra, S., & Meindl, P. (2010). *Supply Chain Management: Strategy, Planning, and Operation* (4th ed.). Boston, MA: Pearson Education.
- Christopher, M. (1998). *Logistics and Supply Chain Management: Strategies for Reducing Cost and Improving Service* (2nd ed.). London: Prentice Hall.
- Cox, A., Ireland, P., Lonsdale, C., Sanderson, J., & Watson, G. (2003). *Supply chain management: A guide to best practice*. Great Britain: Pearson Education Limited.
- Decrop, A. (1999). Triangulation in Qualitative Tourism Research: *Tourism Management*, 20(2), 157–161. [http://dx.doi.org/10.1016/S0261-5177\(98\)00102-2](http://dx.doi.org/10.1016/S0261-5177(98)00102-2)
- Decrop, A. (2004). Trustworthiness in Qualitative tourism Research. In J. Phillimore & L. Goodson (Eds.), *Ontologies, Epistemologies and Methodologies* (pp. 156–167). London: Routledge.
- Doyle, P. (1994). *Marketing Management and Strategy*. London: Prentice-Hall.
- Farley, G. A. (1997). Discovering Supply Chain management: A Roundtable Discussion. *APICS—The performance Advantage*, 7(1), 38–39.
- Goh, M., & Pinaikul, P. (1998). Logistics management practices and development in Thailand. *Logistics Information Management*, 11(6), 359–369. <http://dx.doi.org/10.1108/09576059810242471>
- Gunasekaran, A., Patel, C., & McGaughey, R. E. (2004). A framework for supply chain performance measurement. *International Journal of Production Economics*, 87(3), 333–347. <http://dx.doi.org/10.1016/j.ijpe.2003.08.003>

- Handfield, R. B., Sroufe, R., & Walton, S. V. (2005). Integrating environmental management and supply chain strategies. *Business Strategy and the Environment*, 14(1), 1–19. <http://dx.doi.org/10.1002/bse.422>
- Handfield, R., & Nichols, E. (1999). *Introduction to Supply Chain Management*. Englewood Cliffs: Prentice Hall.
- Hardy, C., & Philips, N. (1998). Strategies of Engagement: Lessons from the critical examination of collaboration and conflict in an Inter-organizational domain. *Organization Science*, 9(2), 217–230. <http://dx.doi.org/10.1287/orsc.9.2.217>
- Hu, A. H. (2010). Critical factors for implementing green supply chain management practice. *Management research review*, 33(6), 853–857. <http://dx.doi.org/10.1108/01409171011050208>
- Kahn, K., & Mentzer, J. (1996). Logistics and interdepartmental integration. *International Journal of Physical Distribution and Logistics Management*, 26(8), 6–14. <http://dx.doi.org/10.1108/09600039610182753>
- Kombo, D. K., & Tromp, D. L. (2011). *Proposal and Thesis writing: An introduction*. Nairobi: Pauline's publications Africa.
- Kothari, C. R. (2009). *Research methodology: Methods and Techniques*. India New Delhi: Willey Eastern Ltd.
- Kwon, I., & Suh, T. (2004). Factors affecting the level of trust and commitment in supply chain relationships. *Journal of Supply Chain Management*, 40(2), 4–14. <http://dx.doi.org/10.1111/j.1745-493X.2004.tb00165.x>
- Lee, H. L., & Whang, S. (2001). E-Business and Supply Chain Integration. *Stanford Global Supply Chain Management Forum*, 223–241.
- Lee, H. L., Padmanabhan, V., & Wang, S. (1997). The Bullwhip effect in Supply Chains. *Sloan Management Review*, 38(3), 93–102.
- Li, S. H., Ragu-Nathan, B., Ragu-Nathan, T. S., & Rao, S. S. (2006). The Impact of Supply Shain Management Practices on Competitive Advantage and Organizational Performance. *Omega*, 34(2), 107–124. <http://dx.doi.org/10.1016/j.omega.2004.08.002>
- Lysons, K., & Farrington, B. (2012). *Purchasing and Supply Chain Management* (8th ed.). Pearson Harlow: CIPS Textbook.
- Matos, S., & Hall, J. (2007). Integrating sustainable development in the supply chain: The case of life cycle assessment in oil and gas and agricultural biotechnology. *Journal of Operations Management*, 25(6), 1083–1102. <http://dx.doi.org/10.1016/j.jom.2007.01.013>
- Mentzer, J. T. (2004). *Fundamentals of Supply Chain Management: Twelve Drivers for Competitive Advantage*. Thousand Oaks, CA: Sage Publications, Inc.
- Moberg, C. R., Cutler, B. D., Gross, A., & Speh, T. W. (2002). Identifying antecedents of information exchange within supply chains. *International Journal for Physical Distribution & Logistics*, 32(9), 755–770. <http://dx.doi.org/10.1108/09600030210452431>
- Mugenda, O. M., & Mugenda A.G. (2008). *Research Methods: Quantitative and Qualitative Approaches*. Nairobi: Acts press.
- Nachmias, C., & Nachmias, D. (2008). *Research Methods in Social Sciences* (7th ed.). New York: Worth Publishers.
- Orodho, J., & Kombo, D. (2002). *Research methods*. Nairobi: Kenyatta University, Institute of Open learning.
- Pagell, M. (2004). Understanding the factors that enable and inhibit the integration of operations, purchasing and logistics. *Journal of Operations Management*, 22(5), 459–487. <http://dx.doi.org/10.1016/j.jom.2004.05.008>
- Patton, M. Q. (2002). *Qualitative Research and Evaluation Methods*. Thousand Oaks and London: Sage Publication.
- Porter, M. E. (1985). *Competitive advantage: creating and sustaining superior performance*. New York: The Free Press.
- Power, D. (2005). Supply chain management integration and implementation: A literature review. *Supply Chain Management*, 10(3), 252–263. <http://dx.doi.org/10.1108/13598540510612721>

- Premkumar, G., Ramamurthy, K., & Saunders, C. (2003). Information processing view of organizations: An exploratory examination of fit in the context of inter-organizational relationships. *Journal of Management Information Systems*, 22(1), 257–294.
- Ring, P., & Van de Ven, A. (1992). Structuring Cooperative relationships between organizations: *Strategic Management Journal*, 13(7), 483–498. <http://dx.doi.org/10.1002/smj.4250130702>
- Salam, M. A. (2008, December 3–5). Green procurement adoption in manufacturing supply chain. *Proceedings of the 9th Asia Pasific Industrial Engineering & Management Systems Conference (APIEMS2008)* (pp. 1253–1260). Indonesia.
- Scott, C., & Westbrook, R. (1991). New strategic tools for supply chain management. *International Journal of Physical Distribution & Logistics Management*, 21(1), 23–33. <http://dx.doi.org/10.1108/09600039110002225>
- Shah, J. (2009). *Supply Chain Management: Text and Cases*. New Delhi, India: Pearson Education.
- Sharma, M. K., & Bhagwat, R. (2006). Practice of information systems: Evidence from select Indian SMEs. *Journal of Manufacturing Technology*, 17(2), 199–223. <http://dx.doi.org/10.1108/17410380610642278>
- Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2009). *Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies* (3rd ed.). New York: McGraw-Hill.
- Spekman, R. E., Kamauff, J. W., & Myhr, N. (1998). An empirical investigation into supply chain management: A perspective on partnerships. *Supply Chain Management: An International Journal*, 3(2), 53–67. <http://dx.doi.org/10.1108/13598549810215379>
- Stadtler, H., & Kilger, C. (2005). *Supply Chain Management and Advanced Planning: Concepts, Models, Software and Case Studies*. Berlin: Springer. <http://dx.doi.org/10.1007/b106298>
- Stank, T. P., Keller, S. B., & Daugherty, P. J. (2001). Supply Chain Collaboration and Logistical service performance. *Journal of Business Logistics*, 22(1), 29–48. <http://dx.doi.org/10.1002/j.2158-1592.2001.tb00158.x>
- Stonebraker, P., & Liao, J. (2004). Environmental turbulence, strategic orientation: Modeling supply chain integration. *International Journal of Operations & Production Management*, 24(10), 1037–1054. <http://dx.doi.org/10.1108/01443570410558067>
- Tan, X. C., Liu, F., Cao, H. J., & Zhang, H. (2002). A decision making framework model of cutting fluid selection for green manufacturing and a case study. *J. Mater. Process. Tech*, 129(1), 467–470. [http://dx.doi.org/10.1016/S0924-0136\(02\)00614-3](http://dx.doi.org/10.1016/S0924-0136(02)00614-3)
- Trochin, W. (2004). *Research Methods Knowledge Base. Ithaca: Cornell University UNIDO (2006) Product quality: A guide for small and Medium-sized enterprises*. Working paper.
- United Kingdom Cabinet Office. (1999). *The Performance and Innovation Unit*. Retrieved from <http://www.cabinet-office.gov.uk/innovation/1999/ecommerce>
- Van Hock, R., & Erasmus, I. (2000). From reversed logistics to green supply chains. *Logistics Solutions*, 4(3), 28–33.
- Yu, Z., Yan, H., & Cheng, T. (2001). Benefits of information sharing with supply chain partnerships. *Industrial Management & Data Systems*, 101(3), 114–119. <http://dx.doi.org/10.1108/02635570110386625>
- Zhu, Q., Sarkis, J., & Geng, Y. (2005). Green supply chain management in China: Pressures, Practices and performance. *International Journal of Operations & Production Management*, 25(5), 449–468. <http://dx.doi.org/10.1108/01443570510593148>

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