

Chapter 9

Enhancing Closed–Loop Supply Chain in Global Supply Chain

Kijpokin Kasemsap

Suan Sunandha Rajabhat University, Thailand

ABSTRACT

This chapter explains the overview of Closed-Loop Supply Chain (CLSC); CLSC activities and reverse logistics outsourcing in global supply chain; and the applications of CLSC in global supply chain. CLSC, the integration of the forward and reverse supply chains, is an emerging area of interest as firms seek to reduce the costs of product returns, increase profits through value recovery, and meet more rigorous environmental standards. In CLSC, the original manufacturer will take the used product and remake it. CLSC deals with the uncertainty in the timing, location, quantity, and quality of returned products. CLSC integrates the returns of end-of-life products from end-users to retailers, manufacturers, and suppliers for refurbishment, remanufacturing, and recycling. The chapter argues that enhancing CLSC has the potential to reach strategic goals toward sustainability in global supply chain.

INTRODUCTION

Supply chain management (SCM) is the management of material and information flow in a supply chain to provide the highest degree of customer satisfaction at the lowest possible cost (Kasemsap, 2016a), and involves the entire network of entities, directly or indirectly interlinked and interdependent in serving the same customer (Kasemsap, 2017a). Environmental, social, and economic concerns significantly motivate the operation of closed-loop supply chain (CLSC) in many industries (Keyvanshokoo, Ryan, & Kabir, 2016) toward sustainable development (He, 2015). CLSC essentially combines the traditional supply chain (i.e., forward logistics) with reverse logistics, considering the item after it is served its original purpose.

Once the item has been manufactured, shipped, and distributed through a reseller, the manufacturer works to encourage the item's return once it is no longer functional or needed. The successful global retailing requires both strategic and tactical initiatives regarding retail marketing strategies and brand management (Kasemsap, 2016b). Concerning reverse logistics, the items can either be repaired and re-

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sold, or they can be itemized for the reuse in future products. CLSC is the important perspective related to the design, control, and operation of the supply chain system to maximize the value creation (Thiell, Zuluaga, Montañez, & van Hoof, 2011) over the product life cycle with the recovery of supply chain value (Gaur, Amini, & Rao, 2017) concerning product returns (Govindan, Soleimani, & Kannan, 2015).

Manufacturers are establishing economically viable production and distribution systems that enable the remanufacturing of used products in parallel with the manufacturing of new units. Remanufactured products are typically upgraded to the quality standards of new products, so that they can be sold in new product markets. CLSC is the significant business model for supply chain companies due to the capability of value recovery, environmental sustainability, and special importance given by customers to CLSC practices toward creating business growth (Das & Posinasetti, 2015). Environmental sustainability is important because it ensures people have water and resources, and adopting its practices protects the environment and human health (Kasemsap, 2017b).

Products first flow outbound to a customer (i.e., forward logistics); those same products then flow back inbound, often in an altered condition (i.e., reverse logistics) (Jayaraman, Guide, & Srivastava, 1999). As it is environmentally sustainable, CLSC is one of the most significant strategies in the future (Blumberg, 2004) and aims at generating profit for business enterprises (Basiri, Shemshadi, & Tarokh, 2013) through integrating forward and reverse logistics (Guide & van Wassenhove, 2009), regarding production planning, inventory control, and distribution planning (Poles, 2012) in order to recapture the additional supply chain values (Guide & van Wassenhove, 2006).

The configuration of both forward logistics and reverse logistics has a strong effect on each other (Ghezavati & Nia, 2015). The increasing need for remanufacturing due to resources shortage, environmental deterioration, and new regulations, requires companies to organize their supply chain activities in order to take advantage of integrating forward logistics and reverse logistics (Ramezani, Kimiagari, & Karimi, 2014). Regarding reverse logistics, the manufacturer retrieves the used products from the market where they are dispersed among customers (Liao & Li, 2016). In the CLSC, reverse logistics involves the after-sale operations for the reuse, refurbishing, remanufacturing, and recycling of the end-of-life products (Govindan & Popiuc, 2014).

This chapter is based on a literature review of CLSC. The extensive literature of CLSC provides a contribution to practitioners and researchers by explaining the advanced issues of CLSC in global supply chain.

BACKGROUND

Nowadays, CLSC management is a major approach to implementing sustainable operations (Sahamie, Stindt, & Nuss, 2013). Analyzing carbon emissions is critical for successfully managing sustainable production and consumption (He, Xiong, & Lin, 2016) toward sustainability (Kasemsap, 2016c). The preventive shift to a sustainable supply chain has positive business impacts including risk management, realizing gains through more efficient operations, creating sustainable products, and improving sustainability in global supply chain (Kasemsap, 2017c). Government legislation and consumer awareness on carbon emissions have required industries to seek the alternative ways to reorganize their supply chains (Xu, Pokharel, Elomri, & Mutlu, 2017).

Green supply chain management (GSCM) addresses the industrial ecosystems through various CLSC practices at the product life cycle phases (Sarkis, 2003). GSCM strategies help companies maximize the

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