Chapter 12
Development of Supply Chain Framework for the Circular Economy

Yanamandra Ramakrishna
https://orcid.org/0000-0001-9101-6072
School of Business, Skyline University College, UAE

ABSTRACT

The rapid pace at which technology has contributed several technological products and gadgets created a surplus in some areas and deficiencies in some areas of the modern world. For instance, there is a tremendous wastage of food in one country, excessive usage of electronic items in some other countries, and in many other countries, people starve for food and possession of basic electronic items. This situation has led to imbalance and wastage. In addition, sustained efforts to reuse/recycle the goods produced by different business organizations are inadequate. SCM plays a role in re-usability of goods and recycling of used goods. Organizations have to redesign their supply chains to achieve the objective of the circular economy, which propagates the concept of wealth out of waste by reusing/recycling the products. The research in the area of the role of the supply chain in the circular economy is just gaining its importance, and it is still in the nascent stage. Hence, this chapter highlights the significance of in circular economy by developing a framework that emphasizes its role.

INTRODUCTION

Industrial revolution and industrial development have contributed to the enormous progress and growth of humanity during the last several centuries. It has also led to unprecedented growth in technology and growth in products and services dependent on technology. While this growth enabled improvement in the overall quality of life of individuals, it also created several challenges to the humanity in terms of environmental pollution, biodegradation, deforestation, degeneration of natural resources of the plant, which resulted in social inequality (Liudmyla Deineko, Olena Tsyplitska & Oleksandr Deineko, 2019). At the same time, consumption levels have increased worldwide resulting into wastage of items and

DOI: 10.4018/978-1-7998-5116-5.ch012

pollution to the environment. Implementation of strategies and practices of Supply Chain Management (SCM) by the business enterprises, like effective information sharing, matching of supply with demand, efficient inventory management throughout the chain and green practices have contributed to some extent a reduction in this wastage (Genovese, A., Acquaye, A.A., Figueroa, A. and Koh, S.L. 2017). SCM also has provided the enterprises with better decision-making ability and improved customer service by reducing the costs of operations (Junjun Liu, Yunting Feng, Qinghua Zhu, & Joseph Sarkis, 2018). However, at the same time, advancements in SCM related to other important aspects like reusability and recyclability of products, development of eco-friendly logistics and manufacturing systems, and usage of alternate environmentally friendly energy resources are yet to gain momentum (Roberta De Angelis, Mickey Howard & Joe Miemczyk, 2018). These advancements in SCM will shift the focus of SCM from a traditional one to a futuristic, sustainable and the one leading towards achieving the objectives of what is known as circular economy (Genovese, A., 2017).

Circular economy is an economic model, which provides economic growth with a focus on green development to transform the present mass consumption to what is known as responsible consumption, in which supply chain management plays a major role (Catherine Weetman, 2017). The supply chain in circular economy is also known as 'closed supply chain'. This type of economy is supposed to reduce the waste, improve reuse and recyclability. The circular economy has seen a significant increase in interest by the researchers and practitioners over the past few years and is continuing to gain steady momentum (Ellen MacArthur Foundation (EMF), 2019).

While traditional SCM has been defined by many authors from diverse perspectives (Sourabh Jain, 2018), for the purpose of this research, the definition of SCM as provided by Moh'd Anwer et al., (2017) is considered. It states that SCM is a process of coordination of the business functions across the businesses within the firm and across businesses within other firms in supply chain for providing and improving products and information flows from suppliers till end customers in order to enhance firm performance and satisfy customer needs, wants, and requests. Traditional SCM is also considered as an approach based on the linear flow of materials and fails to include both environmental aspects and management of the end-of-life phase of products (Sarkis, 1999). Thus, the concepts of reverse supply chains, closed supply chain, green and sustainable supply chains have emerged which have the ability to deal with the accumulation of waste and provide an appropriate methodology to minimize the waste (Johnsen, T., Howard, M., & Miemczyk, J., 2014; Junjun Liu et al., 2018) and contribute towards circular economy (Ellen MacArthur Foundation, 2019).

The weaknesses of traditional supply chains without much focus on reuse and reduce of waste also contributed to the growth of circular economy (Liudmyla Deineko et al., 2019). Increasing urbanization, rising inequality and political upheaval are also some other reasons. The traditional supply chain in many business enterprises works on the principle of profit maximization, leakage of value, excessive usage of raw material, and finally selling the products in high volumes (Catherine Weetman, 2017). This leads to the wastage of many natural resources like water, energy, land and finally causes harm to the environment. The linear operating models in economy and supply chain management also face challenges like expansion of middle class consumers, regulatory restrictions, and unprecedented competition. These challenges have become a threat to the sustainability of linear models in economy and supply chain management (Accenture, 2014; WEF *et al.,* 2014). It is accepted that if the practices and strategies of SCM at business enterprises are redesigned and focused, then SCM can play a significant role in contributing towards the achievement of the objectives of circular economy. But, neither the academic contribution