

Supply chain collaboration for sustainable Industry 4.0: A case study from the apparel industry

D. D. Gamage* and T. D. Rupasinghe

*Department of Industrial Management, Faculty of Science,
University of Kelaniya, Sri Lanka*

**Email: darshathagamage@gmail.com*

Due to the advancement of technology and the dominance of the consumer economy, it has become important for businesses to adopt sustainable practices and innovative technologies to boost productivity in their business processes. The purpose of such sustainable practices is in bringing in balance between the economic, social and environmental spheres of a business. The advancement of technology has brought the 4th industrial revolution to the world in which businesses around the world are integrating the use of cyber-physical systems for improved outcomes. There are studies conducted on the impact of Industry 4.0 applications on collaborative supply chains. The focus of this study is to simulate the applications of Industry 4.0 in supply chain collaboration in driving sustainability in the apparel industry using *NetLogo* – a programmable modelling environment. It will use an existing framework of collaboration characteristics supported through Industry 4.0 application and will consider the behavior of supply chain agents under varying conditions of certain specified characteristics. It will study how information sharing, sense making, resource pooling, goal congruency, empowerment and cross functionality of the collaborative supply chain impact on its sustainability in terms of carbon emissions with Life Cycle Assessment. This study shows that improved levels of collaboration through Industry 4.0 applications have a positive effect in reducing the carbon footprint of the supply chain of the apparel industry.

Keywords: Apparel industry, Industry 4.0, Supply chain collaboration, Sustainability