

# **Supply Contract Analysis for an Eco-friendly Textile Supply Chain**

**Arnab Adhikari**  
Operations Management Group  
Indian Institute of Management Ranchi  
Jharkhand, India  
arnab.a@iimranchi.ac.in

## **Abstract**

In recent times, the world has experienced the rising importance of environmental friendliness in the textile and apparel industry. Examples of organizations such as Patagonia, Walmart, etc. signify this phenomenon. Motivated by this issue, here we design a dyadic environmental friendly textile supply chain comprising one apparel manufacturer and one apparel retailer under price and environmental friendliness sensitive demand. First, we design the supply chain under a centralized and a decentralized setting using wholesale price contract. Here, we determine the optimal greening level, wholesale price, retail price of the apparel. Then, we propose two mechanisms, i.e., cost-sharing and profit-sharing approach between the apparel manufacturer and the apparel retailer to improve the greening level of the apparel. Under these mechanisms, we determine the optimal greening level, wholesale price, retail price of the apparel. With the help of comparative analysis, we show that the greening level and the profitability of the supply chain members increase under these mechanisms compared to that under wholesale price contract, whereas profit-sharing mechanism emerges as the best option for both. Additionally, we demonstrate the impact of the customer's green sensitiveness and the cost of greening production on the decision variables mentioned above.

## **Keywords (12 font)**

Environmental friendly supply chain, Textile industry, Supply contract, Profit-sharing, and Cost-sharing.

## **Biography**

**Arnab Adhikari** is an Assistant Professor in operations management area at the Indian Institute of Management Ranchi (IIM Ranchi). He has completed his fpm (fellowship programme in management) in operations management from Indian institute of Management Calcutta and has been awarded the degree "Fellow of Indian Institute of management Calcutta". Prior to the doctoral study, he worked in Wipro technologies for 1.5 years as a SAP consultant. He earned his bachelor of technology (B. Tech) degree in Electronics and Communication Engineering from National Institute of Technology Durgapur. His research articles have appeared in the several reputed international journals such as European Journal of Operational Research, Annals of Operations Research, Informs Transactions on Education, INFOR: Information Systems and Operational Research, etc. His research Interest includes supply chain coordination, supply chain network design, facility layout design, risk management, green supply chain, pricing strategies, etc.