

# **ABSTRACT**

## **Designing Sustainable Supply Chain Networks**

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Supply chains have grown tremendously in recent years and focusing only on the economic performance to optimize the costs or return on investments (ROIs) cannot alone sustain the development of supply chain operations. The impact of different activities involved in supply chains such as the process of manufacturing, warehousing, distributing etc. on environment and social life of city residents cannot be ignored. Correspondingly, the concepts of green supply chain management (GSCM) and sustainable supply chain management (SSCM) have emerged which emphasize the importance of implementing environment and social concerns along with economical factors in supply chain planning. Other perspectives from the management domain insist that for sustainability, supply chain management should strive for enterprise governance, business regulations, corporate responsibilities, and social justice.

In this thesis, we study the problem of designing sustainable supply chain networks. This involves reviewing state-of-the-art concepts for planning sustainable supply chains, capturing customer and technical requirements using Voice of the Customer (VOC), investigating the relationship between customer requirements and technical requirements using Sustainable Function Deployment (SFD) and finally designing sustainable supply

chain networks by transmitting the weighted technical requirements obtained from SFD into an integer programming model. AIMMS software is used to implement this model.

The proposed approach is novel and deals with the important problem of designing supply chain networks to achieve sustainability from socio-economic-environmental perspective. The strengths and directions for future work are presented using SWOT analysis.