Abstract

Designing Green Supply Chains (GSCs) requires complex decision-support models that can deal with multiple dimensions of sustainability while taking into account specific characteristics of products and their supply chain. Multi-Criteria Decision Making (MCDM) approaches can be used to quantify trade-offs between economic, social, and environmental criteria i.e. to identify green production options. The aim of this chapter is to review the use of MCDM approaches for designing efficient and effective GSCs. We develop a conceptual framework to find relevant publications and to categorise papers with respect to decision problems, indicators, and MCDM approaches. The analysis shows that (1) the use of MCDM approaches for designing GSCs is a rather new but emerging research field, (2) most of the publications focus on production and distribution problems, and there are only a few inventory models with environmental considerations, (3) the majority of papers assume all data to be deterministic, (4) little attention has been given to minimization of waste, (5) numerous indicators are used to account for eco-efficiency, indicating the lack of standards. This study, therefore, identifies the need for more multi-criteria models for real-life GSCs, especially with inclusion of uncertainty in parameters that are associated with GSCs.