Green Supply Chain Decision Making: Theoretical Models and Real-World Practice

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Theoretical models for the decision to implement green supply chain practices (GSCP) are often based on classical economics, but can overlap with organizational psychology and organizational development perspectives. Fahiminia, Jabbarzadeh, and Sarkis (2015) explore the issue in terms of cost versus environmental impact, and propose a model that compares green practices to traditional lean manufacturing methods. The rational basis for this model is that organizations should choose the practices that provide the greatest benefit, either economic or environmental, on a Pareto basis. The researchers support this model with case study evidence demonstrating that lean practices can provide minimal economic benefit while incurring significant environmental costs. While this model is mathematically sound, the authors admit that it requires data processing capabilities that many organizations do not possess. The model also does not consider less tangible costs, such as consumer sentiment.

Models such as that proposed by Tian, Govindan, and Zhu (2014) bridge this gap through a game theory perspective that considers the interests of many stakeholders. Tian et al. (2014) find that environmental factors such as government subsidies are actually a more effective motivator to GSCP implementation than consumer sentiment, which they support with evidence from the Chinese automotive industry. However, aside from having assumptions that may not apply to the real world, such as manufacturers pursuing only one strategy at a time, this study uses the Chinese government and people as a model stakeholder. Due to the different composition of the Chinese economy and the interests of its government, the results of this model may not hold for all scenarios. This is reinforced by Wu, Liao, Tseng, and Chu (2015), who found that practices that reduce material costs, such as recycling programs, are a major predictor of GSCP implementation for Vietnamese auto manufacturers.

Considering the varying priorities and results of these models, it can be concluded that the decision to employ GSCP is a complex process that must be based on a clear and directed analysis of the business environment and the goals of the firm. This issue has been addressed by several recent studies using the DEMATEL modeling method, which is designed for the resolution of problems in complex systems and stands in contrast to the mathematically rigorous but theoretically linear models described above.

Hwang, Huang, and Wu (2016) form a model that ranks factors that affect decision-making based on the responses of industry experts, and conclude that "the adoption of green practices is determined by external environments and internal organization…but technological factors are rarely discussed" (p. 16). Mangla, Kumar, and Barua (2014) come to the more specific conclusion that supplier selection and government relations are the most significant factors affecting GSCP implementations. However, these results are contradicted by Govindan, Muduli, Devika, and Barve (2016), who find that management commitment and "competitiveness" are the driving factors affecting GSCP adoption. There are several possible explanations for these differing conclusions. First, the researchers considered different industries, plastics and mining. Second, Govindan et al. focused on the internal characteristics of firms.

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