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Special issue on sustainability trends: metrics and approaches

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Today's organizations should account for sustainability concepts, metrics, and approaches that target the development of successful and profitable global supply chain networks. This important tenet in the academic and industrial environment was the motivation for this special issue of *Supply Chain Forum: An International Journal*. The objective of this special issue is to present the most up-to-date research in sustainability trends by identifying suitable metrics and approaches in supply chain environments from a variety of industries – services and manufacturing – that concern academic and industrial communities.

The international conference on Information Systems, Logistics and Supply Chain (ILS), organized on June 1–4, 2016 at The Kedge Business School in Bordeaux, France, addressed a broad range of topics related to supply chain networks, logistics operations management, supply chain management and optimization, and information systems. All of these topics considered sustainability impacts. Participants at the ILS 2016 conference had the opportunity to (1) discuss emerging research and industrial issues, (2) share common practices and recent research development in academia and industry, and (3) identify research opportunities in a variety of areas in Supply Chain Management.

Five of seven papers published in this issue of the *Supply Chain Forum: An International Journal* were selected among the best contributions in the topic of *Sustainability Trends: Metrics and Approaches*. The papers were discussed at the ILS 2016 conference, then these papers were revised and extended, as well as subjected to the peer review process prescribed by the journal in its review process. Papers contents are promising and present substantial advances on a variety of topics in supply chain by providing design approaches of sustainable supply chains, impacts analysis of transportation approaches to supply-chain performance, as well as methods to overcome bias across country borders to maintain sustainable systems or to analyze supply-chain risks in disrupting environment. Each selected topic is introduced next.

The first paper by Novoa, et al., 'A Zero Carbon Supply Chain Model: Minimizing Levelized Cost of

Onsite Renewable Generation,' presents the major issues being addressed in sustainable supply chains (SSC) and the complexities of metrics design in SSC regarding environmental aspects with an integrated production-transportation system. The authors developed a linear optimization model to operate a net-zero carbon supply chain network via 100 percent of onsite wind and solar generation. The model shows the feasibility and economical viable of a zero-carbon supply chain operation.

The importance of supply chain performance in a sustainable system is next addressed by Figliozzi and Tipagornwong in the second paper 'Impact of Last Mile Parking Availability on Commercial Vehicle Costs and Operations.' This research combines logistics, queuing, and optimization models to study the impact of last mile parking availability on commercial vehicle costs and operations. A scenario approach is conducted to study the impact of parking availability on typical less-than-truckload (LTL) and courier service costs. Elasticity values indicate that a few variables have a significant impact on commercial vehicle parking behavior. Parking availability levels do affect commercial vehicle costs and operations significantly. The magnitude of the impacts is a function of customer and route characteristics.

The third paper is a case study 'Impact of Cargo Railway Transportation Service Quality on Enterprises in Piauí, Brazil' that links the transportation network (railway) and the service level. Mendes dos Reis, et al. made the case of the criticality of the railway transportation to the flow of goods, primarily those with low added value and high cargo volume. This international case study on a developing country validates the critical importance of logistics (transportation) infrastructure in a sustainable supply chain. The lack of adequate routes increases lead times and limits the ability to export goods.

The contribution of environmental performance assessment of products for the improvement of sustainability in supply chains is addressed by Aymard et al. in the fourth paper 'Normalization in Life-Cycle Assessment: consequences of new European factors on decision-making.' The authors studied the most recent International reference Life-Cycle Data system

(ILCD) normalization factors compared to the older but most commonly used systems. Based on an industrial case study, they highlighted the consequences of its usage on business decisions and the need to link these approaches and metrics with supply-chain performance evaluation models.

A topic experienced in every aspect of the globalized and complex supply chains is risk. The way risk is measured, its impact on disruptions accounted for, and the planning and optimizing to mitigate risk is harder than ever to measure. In the fifth paper, 'Rethinking Supply Chain Risk Analysis – Common Flaws, Core Areas, & Main Tasks,' Heckmann and Nickel discuss common biases of supply chain risk analysis, identify misinterpretations and missing aspects, and provide the main elements that reveal dynamics and result in supply chain risks.

We believe that this selection of papers from the 6th ILS International Conference adds value to the body of literature – academic and industry – on *Sustainability Trends: Metrics & Approaches* for the supply chain. The guest editors thank the authors for

their valuable contributions reserved for this special issue, the reviewers for their commitment of time and valuable feedback to authors, and the supporting journal staff. All these factors have made this special issue possible.

Sincerely,

Cecilia Temponi and Valérie Botta-Genoulaz
Associate guest editors

Note

Two additional papers are included in this special issue. The papers have relevance to the topics addressed in this special issue on *Sustainability Trends: Metrics and Approaches*. One of the papers is 'A new fuzzy logic based metric to measure lean warehousing performance' by Buonamico et al. Emphasis is on the selection of the right metrics on warehouse's leanness as a way to identify key performance indicators in the efforts of a sustainable integrated supply chains. The second paper added to this special issue is titled 'A Global Simulation-Optimization Approach for Inventory Management in a Decentralized Supply Chain' by Montarelo et al. The paper addresses issues on inventory management and optimization in the supply chain.