

## Workshop on Environmental Management and Sustainability

### Sustainable Supply Chain Management in Emerging Economies:

#### Environmental Turbulence, Institutional Voids and Sustainability Trajectories<sup>123</sup>

During the past two decades, supply chain management has become an important research theme in the business literature. Business leaders, academics, and policy makers recognize that the management of supply chains is crucial in the highly competitive global business environment, and it has become clear that well-managed supply chains provide operational and strategic advantages to organizations, regions, and countries. This growing awareness of the importance of supply chains has generated a robust literature which has examined how supply chains can be integrated (e.g., Lee, 2000, Fawcett and Magnan, 2002) and coordinated (e.g., Simatupang and Sridharan, 2002; Soosay et al., 2008), and how supply chains can facilitate collaboration (e.g., Barratt, 2004; Vachon and Klassen, 2006), sustainability (e.g., Carter and Rogers, 2008; Hall et al.; 2012a), and innovative performance (e.g., Choi and Krause, 2006; Silvestre, 2014).

One key research stream, which explores why and how supply chains incorporate and manage *sustainability*, has generated significant attention within industry, academia, and policy circles. The literature on “green” or “environmental” supply chains (Carter and Dresner, 2001; Matos and Silvestre, 2012) argues that the impact of supply chains on the natural environment must be taken into account when making management decisions. While the environmental implications

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1 The author of this paper is Dr. Bruno S. Silvestre, PhD, Associate Professor and Chancellor’s Research Chair in Sustainable Supply Chains and Innovation Management, Faculty of Business and Economics at The University of Winnipeg, Canada.

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of supply chains are clearly important, the concept of sustainability is more all-encompassing and must include not only the economic and environmental dimensions, but also the social impact of supply chain operations. This “triple bottom line” idea (Elkington, 1997) nicely captures the three intrinsically related dimensions of sustainability (social, environmental, and economic) that have been identified as crucial performance dimensions for sustainable supply chains (Linton et al., 2007; Markley and Davis, 2007; Seuring and Muller, 2008).

In spite of the increasing research on sustainable supply chains, there is a paucity of empirical evidence and theoretical reflection on sustainable supply chains in developing and emerging economies (Sahay and Mohan, 2003; Zhu et al., 2005; Silvestre and Silva Neto, 2013). Accordingly, the goal of the research reported here is to enhance our understanding of how sustainability can be incorporated and managed within supply chains in emerging economies. To achieve this goal, this paper draws on institutional theory, evolutionary theory, complexity theory, and on the organizational learning, innovation and strategy literatures to build a theoretical framework that clarifies the challenges and opportunities of sustainable supply chain management in developing and emerging economies.

Supply chains are often defined as vertical sequences of interdependent transactions that add value for the final consumer (Lazzarini et al., 2001). However, in line with several other researchers (Choi et al., 2001; Kim et al., 2011), this research does not view the supply chain as simply a linear chain between companies, but rather as a complex and dynamic network of organizations. Lazzarini et al. (2001) and van Bommel (2011) suggest the term “supply networks” to reinforce the strong network nature of supply chains.

The core assumption of the supply-chain-as-a-network-of-organizations idea is that firms do not compete in isolation, but rather work together with their supply chain partners (Spekman et al., 1998; Lummus and Vokurka, 1999; Hall, 2000). Since different supply chains compete against each other, it is important that all stages of the supply chain operate efficiently and responsively so that the whole system can perform sustainably. If one stage of the supply chain is inefficient, or exhibits

a low level of responsiveness, or is not sensitive to an emerging environmental or social issue, the entire supply chain will suffer and eventually fail (Hall et al., 2011). Three interrelated elements are necessary for an effective and sustainable supply chain: integration, collaboration, and innovation.

Supply chains are similar to organizations: they are initially immature, but over time they learn, absorb, and accumulate knowledge and new capabilities that allow them to perform new activities, innovate, and develop even more new capabilities (Nelson and Winter, 1982; Silvestre and Dalcol, 2009; Hall et al., 2012a). The process also allows supply chain members to learn how they can effectively work together to integrate activities, and to collaboratively operate by understanding the needs of each supply chain partner and the specificities of each supply chain relationship. Supply chain members jointly learn how to build capabilities for innovations that will help the entire supply chain to be more sustainable through learning loops.

An organization's external environment has an impact on the learning process (Hedberg, 1981, March, 1981; Levinthal and March, 1993). Organizational learning is a complex and dynamic process which is complicated by an endogenously changing business environment (Levitt and March, 1988), and the external environment can encourage or hinder organizational learning (Fiol and Lyles, 1985). If the "environment is too complex and dynamic for the organization to handle, an overload may occur, and learning will not take place" (Fiol and Lyles, 1985: 805). Environments that are too complex and dynamic are referred to in the literature as highly turbulent business environments. Regarding the environmental turbulence construct, Smart and Vertinsky (1984: 200) propose a continuum, where at one end "there is a static environmental state (no change)" and "at the other end, a turbulent or dynamic state where all factors are in constant flux." The amount of environmental turbulence is closely associated with the degree of uncertainty an organization or supply chain faces. A highly turbulent business environment can cause organizational inertia (Leonard-Barton, 1992), which makes it more difficult for organizations to learn (March and Olsen, 1975). That, in turn, hampers innovation and sustainability.

Institutions, which are referred to as formal rules, informal norms, and the enforcement characteristics of both (DiMaggio and Powell, 1983; North, 1995), can positively or negatively impact innovation and economic performance (Chadee and Roxas, 2013). Although institutions are formed to reduce uncertainty in human exchange (e.g., North, 1995), weak or absent institutions generate institutional voids that can significantly increase the degree of uncertainty within the business environment (Chadee and Roxas, 2013; Mair et al, 2012; Hall et al., 2012b). The growing literature on institutional voids that exist in developing and emerging economies is a reflection of the significance of these phenomena for business activities in such settings. For example, Puffer et al. (2010) suggest that absent and/or weak institutions in China lead businesses to strongly rely on *guanxi*, i.e., informal and personalized networks of influence based on trust. Other research has examined the negative effect of institutional voids in Russia (Chadee and Roxas, 2013), India and other countries (Meyer et al., 2009), and the BRIC countries (Khanna et al., 2005). This paper draws on the construct of institutional voids to describe a context (Brazil) where absent or weak institutions exist (Mair and Marti, 2009; Puffer et al., 2010).

In developing and emerging economies, these two factors—environmental turbulence and institutional voids—prevent supply chains from learning, innovating, and evolving at an appropriate pace on their sustainability trajectory (Silvestre, 2015). Supply chains can take different sustainability trajectories. The slope of a supply chain's sustainability trajectory is associated with how efficiently that supply chain learns and changes towards more sustainable business practices (i.e., how efficiently they process the learning loops – please see Silvestre, 2015). Therefore, the steeper the trajectory slope, quicker the supply chain will reach the desirable sustainability performance. It is important to note that these trajectories are non-linear and multi-directional. Since sustainability is intrinsically connected with time (Bansal and DesJardine, 2014), the pace at which supply chains strategically change towards more sustainable practices matters for their current and future competitive advantage.

Business environments in developing and emerging countries present a higher degree of uncertainty and complexity (Knight, 1921) because they are more turbulent than the business environments encountered in developed countries. This paper therefore relies on two well-established uncertainty constructs to explain the nuances of the business environment. *Causal ambiguity* is the “basic ambiguity concerning the nature of the causal connections between actions and results” (Lippman and Rumelt, 1982: p. 420). It has been an important topic within the operations management literature (e.g., Hora and Klassen, 2013; Vachon and Klassen, 2008). With this type of ambiguity, decision-makers are aware of the possible future scenarios, but are unable to measure the probability that a given future scenario will occur. Managers in this situation often develop inaccurate probability estimates and face issues such as divergence of opinions and partial knowledge (Lippman and Rumelt, 1982; Simon, 1991). Under *extreme ambiguity*, decision-makers are not even aware that certain future scenarios are actually possible (i.e., a state of ignorance). Managers therefore do not consider these possible future scenarios when they make decisions. If decision-makers are unaware of possible future scenarios, they are also unaware of the key relationships between their actions and outcomes.

The research reported here offers four contributions. First, it suggests that supply chains in developing and emerging economies face more barriers to sustainability than supply chains operating in developed countries. Second, it argues that sustainable supply chains are not a destination, but rather a journey because as they move toward more sustainable practices, supply chains go through a complex, dynamic, and evolutionary learning process where innovation matters. Third, although globalization has an impact on any supply chain, natural resource-based supply chains are more geographically limited to those countries where the natural resources are located (and are therefore less physically movable in terms of location), and by the countries’ regulatory characteristics. Fourth, due to the highly turbulent business environments and institutional voids that are evident in developing and emerging economies, focal companies in those

countries play an even more important role in supporting supply chain learning, promoting innovations, and developing processes to build more sustainable supply chains.

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