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Collaboration capacity for sustainable supply chain management: small and medium-sized enterprises in Mexico

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ABSTRACT

Sustainability calls for multi-stakeholder initiatives; hence a requirement for implementing sustainable management approaches is the capacity of different actors to collaborate with each other. This research tested a theoretical model of collaboration capacity as a multi-dimensional organisational construct to gauge cleaner production implementation within supply chains. The construct measured operational, cooperative, and communicative routines of small and medium-sized firms to design, implement and communicate the results of cleaner production projects. Assessment focused on the collaboration capacity of 177 suppliers that participated in the Mexican Sustainable Supply Programme from 2005 to 2008. The results of the study revealed how a supplier's collaboration capacity is influenced by characteristics of firms and managers, such as the firm's sector, the number of participating managers and their profiles. Following collaboration theory reasoning, the empirical findings support the notion that collaboration may contribute to inter-organisational dynamics by strengthening knowledge absorption capacity, structuring solutions, and motivating activity around a commonly defined problem or goal such as cleaner production. Therefore, collaboration capacity is essential for effective implementation of cleaner production. Such cleaner production actions provide competitive advantages for sustainable supply chain management.

1. Introduction

Multi-stakeholder initiatives have frequently been used in demonstration projects designed to accelerate the implementation of cleaner production (CP) approaches and other sustainability-related strategies to improve the environmental, economic, and social performance of firms (Stone, 2006; Baas, 2006). These initiatives included a wide range of mechanisms, including environmental clubs (Sage, 2000), waste exchange programmes (Paquin and Howard-Grenville, 2009), eco-industrial parks (Chertow and Ashton, 2009), and sustainable supply chain initiatives (Fayet and Vermeulen, 2012; Seuring and Müller, 2008; Carter and Rogers, 2008). These multi-stakeholder initiatives differed from traditional implementation approaches that rely on technical assistance and training employees of individual firms, by applying collective methods as a strategy for promoting sustainability improvement among larger groups of companies.

Collective methods were designed to reduce the costs of implementation derived from economies of scale, and recommended targeting small and medium-sized firms (SMEs) in emerging markets (Puppim de Oliveira, 2008; Blackman, 2006). Moreover, interactions with actors interested in firms' activities provided grounds for collaborative learning and action in sustainability (Clarke and Roome, 1999). Similarly, collaboration is a key element of problem-solving because it facilitates dynamic interactions where even incremental actions may produce significant and enduring improvements to help the transition towards sustainable organisations (Lozano, 2007).

Lozano (2007) also noted that developing a multi-dimensional organisational capacity to recognise value and collaboration skills is required for firms to collaborate in sustainability initiatives. Working together implies understanding each other, exchanging information, drawing and sharing group values, solving problems, and new reasoning. The readiness of firms to do so is defined as *collaboration capacity*. Following Huxham (1993), this construct outlines intra-organisational routines entailed in the transfer and absorption of knowledge, and capacity development for both

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sustainable and collaborative action; e.g., firms developing and implementing pollution reduction efforts that help fulfil shared objectives exhibit higher levels of collaboration capacity, while companies with low-level collaboration capacity fail to do so.

The literature generally focuses on technical stratagems to improve the sustainability performance of firms, overlooking organisational dynamics (Baas, 2006; Stone, 2006; Mitchell, 2006; Boons and Baas, 1997). Furthermore, the literature emphasises the role of anchor companies in sustainable supply chain management (Zhu et al., 2010; Vachon and Klassen, 2008; Seuring and Müller, 2008; Carter and Rogers, 2008; Sarkis, 2002; Bowen et al., 2001). But little is known about the collaboration capacity of SMEs, and their capability for successfully joining sustainable supply chain initiatives.

By focussing on the environmental dimension of sustainability, this study addresses this research gap by assessing the collaboration capacity of SMEs participating in the Mexican Sustainable Supply Programme (MSSP). The MSSP offered a unique opportunity to test the construct of collaboration capacity with SME suppliers in the context of an emerging economy. The research questions were: (1) What level of collaboration capacity did SME participation in the MSSP achieve? (2) Did the characteristics of participating companies and managers influence the collaboration capacity of individual suppliers, and if so, how? In order to answer these questions, the research method included the exploration of a conceptual model of collaboration capacity and its fit vis-à-vis MSSP empirical data. In the following sections these questions are addressed.

2. Collaboration theory and sustainable supply chain management

This section addresses collaboration capacity in sustainable supply chain management as a construct for understanding the ability of small and medium- sized firms to connect to multi-stakeholder initiatives. Literature on collaboration theory and sustainable supply chain management is reviewed.

2.1. Collaboration theory

Collaboration theory examines interactions among actors, such as in supply chains (Soosay et al., 2008; Gray, 1985). This social science related approach describes the process, forms, and elements of collaboration as a phenomenon that "occurs when a group of autonomous stakeholders of a problem domain engage in an interactive process, using shared rules, norms and structures, to act or decide on issues related to that domain" (Wood and Gray, 1991).

Collaboration focuses on networks rather than markets and hierarchical governance structures (Powell, 1990). Network partners are interdependent; they participate voluntarily, complement each other's strengths, aim at mutual benefits, and share mutual trust (Soosay et al., 2008; Blomqvist and Levy, 2006; Lambe et al., 2002; Powell et al., 1996). An underlying assumption of collaboration theory considers collaboration to be beneficial for competitiveness (Cao and Zhang, 2011; Huxham, 1993) that outweighs potential collaboration pitfalls, such as lack of control, loss of flexibility, and direct financial costs.

Moreover, collaboration theory highlights collective problem solving of complex issues by means of innovation (Storer and Hyland, 2009; Heimeriks and Duysters, 2007; Blomqvist and Levy, 2006; Inkpin, 1998; Powell et al., 1996). In this context, collaboration aims at confronting complex problems that exceed the capacity of individual firms (Gray, 1985). The problem domain addressed in this paper was defined as improving the ecological performance of SME suppliers. In this inter-organisational field, problem solving through effective collaboration (Lambe et al., 2002) is evidenced by the adoption by suppliers of high impact CP projects.

The preconditions for collaboration entail mutual trust among partners' rational and emotional elements, commitment in attitudes and behaviour, and communication of intention and outcomes (Blomqvist and Levy, 2006; Sharma et al., 1994). These collaboration competences are evidenced in intra- and inter-organisational activities and resources, such as information processing, knowledge absorption, management and control, as well as in communication and negotiation skills. Inter-organisational resources include common norms, the language needed for problem identification, direction setting, and structuring of solutions (Blomqvist and Levy, 2006; Gray, 1985).

Collaboration has been proposed as a pathway for sustainability (Lozano, 2008, 2007) by a change in paradigm from individual action towards joint efforts to achieve common interests. Significant and enduring improvements to transit towards more sustainable organisations are introduced by means of small, incremental actions. The concept entails a non-zero sum game where collective gains outweigh individual costs. To attain sustainable supply, winning or losing in negotiations with suppliers and anchor companies is not what matters; the aim is to reach a system optimum where all players develop sustained relationships.

2.2. Integration of collaboration theory into sustainable supply chain management

Sustainable supply chain management implies that chain partners, such as anchor companies and suppliers, improve their economic, environmental and social performance (Ahi and Searcy, 2013; Carter and Easton, 2011; Seuring and Müller, 2008). These improvements may involve organisational changes in individual companies, joint efforts by supply chain partners, or system-wide changes involving a wider range of stakeholders (Cai et al., 2010; Vachon and Klassen, 2007). Depending on how closely partners are integrated, benefits and efforts are shared or negotiated (Porter and Kramer, 2011; Carter and Rogers, 2008).

Within sustainable supply chain management, CP is viewed as a prevention-oriented environmental management approach, providing opportunities for resource efficiency and reduced environmental loads (Seuring and Müller, 2008; Vachon and Klassen, 2007). CP applications include adjusting operational procedures, technologies and/or developing new activities among supply chain partners, such as product re-use or waste recycling (Lee, 2008; Hirschhorn, 1997). The implementation of these CP measures in and among firms requires specific knowledge of the technical tools needed for priority setting, and the capability to change organisational routines (Stone, 2006; Hult et al., 2003).

Both collaboration and sustainable supply chain management, including CP, are considered as "higher level" organisational capacities (Gold et al., 2010; Gray, 1985): referring to the Japanese Koysei philosophy, Lozano (2008) identified "economic survival" and "internal improvements" as requisite organisational routines for "co-operation outside the company". Similarly, Boons (2009) wrote that the recognition of ecological value by firms is a precondition for deploying strategies aimed at improving their environmental performance. Moreover he argued that only firms with "higher-level" capabilities recognise ecological value as part of continuous operational improvement in implementation of pollution controls or prevention-oriented measures.

Building on these concepts, the new construct of *collaboration capacity for sustainable supply chain management* was developed. This construct integrates a firm's internal structures and processes, as required, to recognise ecological value and, by means of