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Critical factors for sub-supplier management: A sustainable food supply chains perspective

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ABSTRACT

The food industry and its supply chains have significant sustainability implications. Effective supply chain management requires careful consideration of multiple tiers of partners, especially with respect to sustainability issues. Firms increasingly approach their sub-suppliers to drive compliance with social and environmental efforts. A number of complexities and unique challenges make sub-supplier management more difficult than direct supplier management, e.g. a lack of contractual relationships to sub-suppliers, few opportunities to put direct pressure on sub-suppliers, or lack of transparency concerning sub-suppliers' involvement in a focal firm's supply chains. The literature has not investigated, either from sustainability or other perspectives, the critical success factors (CSFs) for firms' sub-supplier management. Therefore, this study seeks to explore and increase understanding of critical factors that help to overcome the complexities and unique challenges of sub-supplier management, with a focus on the food industry. Using data and information from a year-long field study in two food supply chains, the research identified 14 CSFs that influence the success of sub-suppliers' compliance with corporate sustainability standards (CSS). The identified CSFs can be classified into (1) focal firm-related, (2) relationship-related, (3) supply chain partner-related, and (4) context-related CSFs. The present research expands on the theory of critical success factors by applying the theory to the sustainability and sub-supplier management context. In support of critical success theory, it was found that CSFs do exist and their management will be necessary for effective sub-supplier management success as highlighted and exemplified by field study insights from practitioners. Multiple research avenues are necessary for further evaluation of sub-supplier management in the food industry and other industries who may find similar issues that arose from the food industry.

1. Introduction

Firms increasingly face pressure from external stakeholders (e.g. NGOs, customers, regulators) to maintain sustainable supply chains. Focal firms, buyers, are required to take responsibility of their suppliers ensuring the actions of their supply chain in a sustainable manner. Oftentimes, external stakeholders do not differentiate the behavior of the focal firm from its suppliers and hold the focal firm responsible for all activities within product manufacture (Rao, 2002; Koplin et al., 2007). Any party in the supply chain not complying with the focal firm's corporate sustainability standards (CSS) can potentially damage corporate reputation and/or harm customer confidence. Mattel (Barbie), Nike (Football) and Nestlé (Kit Kat) are prominent examples that demonstrated how firms' brands can suffer from non-compliant sub-suppliers (Barnett and King, 2008; Choi and Linton, 2011; Wagner et al., 2009).

Sustainable supply chain management (SSCM) comprises the "management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals of all three dimensions of sustainable development, i.e. economic, environmental and social, into account which are derived from customer and stakeholder requirements" (Seuring and Mueller, 2008b, p. 1700). Past SSCM research has extensively discussed the management of direct suppliers' sustainability performance, but little research has shed light beyond the first-tier supplier level, neglecting sub-suppliers' relationships, roles, and activities.

This research takes a multifaceted perspective of evaluating how to ensure CSS adoption and diffusion through the supply chain. CSS expresses an organization's social and environmental sustainability commitment, which commonly exceeds regulatory requirements (Bansal and Hunter, 2003; Barnett and King, 2008).

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Although this research emphasizes efforts in the food supply chain, this study sets the stage for investigation into general sub-supplier supply chain management.

The sub-supplier management literature highlights how focal firms may apply managerial practices to sub-suppliers to increase a sub-supplier's level of CSS compliance. These sub-supplier management practices can be classified into the two dimensions: assessment (e.g. informal site visits, audits) and collaboration (e.g. trainings, workshops, corrective action plans), having similar characteristics to those applied to direct suppliers (Vachon and Klassen, 2006, 2008; Klassen and Vachon, 2003). However, a lack of contractual relationships with sub-suppliers, inability to put direct pressure on sub-suppliers, and incomplete knowledge about the existence and level of involved sub-suppliers in a focal firms' supply chain reflect some challenges that make managing sub-suppliers unique (Choi and Linton, 2011). Given that the food industry and its supply chains have significant sustainability implications (Yakovleva et al., 2012; Roth et al., 2008), their concerns are an especially sensitive, timely and important focus.

When compared to other industries, food supply chains have some unique characteristics. Food supply chains can be distinguished into "fresh agricultural products" (e.g. vegetables or fruits) and "processed food products" (e.g. convenience food or soft drinks) (Apaiaha et al., 2006). Resulting product-related issues include but are not limited to "shelf life constraints, variability of quality and quantity of supply of farm-based inputs, variable process yield in quantity and quality due to biological variations, seasonality, random factors connected with weather and pests and other biological hazards" (Van der Vorst et al., 2002, p. 124). Stakeholders and consumer concerns have also increased attention for food safety in the food supply chain as well as for environmental and social issues. Efforts have consequently been intensified to enable tracking and tracing of materials and ingredients in food supply chains. For example, food safety and traceability standards by the European Union (EU) requiring every ingredient to be traceable (EU, 2002). In developing countries such as China, various food scandals, such as baby milk formula and pet foods, have also caused serious safety and environmental concerns (Mu and Jia, 2013).

Although food products often have relatively simple bills of materials (ingredients) (Kehoe and Boughton, 2001), food supply chains typically comprise a large variety of different supply chain partners such as retailers, wholesalers/distributors, various traders, processors, marketers/storage, farmers or farm suppliers that increase complexity and decrease transparency (Roth et al., 2008). In the food industry a recognizable amount of ingredients are commoditized or processed as bulk cargo that makes traceability more difficult (Hamprecht et al., 2005). Given the geographical restriction for agricultural cultivation and depending on the consumer market destinations, product flows span great geographical distances. Although business relationships in food supply chains are mostly dyadic, sustainability, certification, and traceability issues are more evident and increasingly require firms to interact with sub-suppliers in these supply chains (Mena et al., 2013; Tran et al., 2013).

For many sustainability standards supplier's or sub-supplier's compliance can only be assessed at the respective production site, source, or farm (e.g. fair salaries or pollution). For traditional supply chain objectives (e.g. availability, quality, or price), performance can be measured also at stages after products leave the production site, e.g. at the interface between the focal firm and the direct suppliers (Koplin et al., 2007). In that case, there is less need to become deeply involved with suppliers' and sub-suppliers' practices at the respective production sites. Less transparency is needed, less specific elements to business practices, and also fewer, if any, cultural changes are required.

Research has not comprehensively addressed what enables or hinders the management of sub-suppliers, in any industry, much less the food industry (Lee, 2008; Seuring and Mueller, 2008b; Fawcett and Magnan, 2002; Millington, 2008). Focal firms require assistance on identifying and ultimately influencing factors, which lead them to successfully implement CSS at sub-suppliers. Consequently, our guiding research questions are:

(1) *What are the critical success factors (CSFs) for the management of sub-suppliers to ensure their compliance with corporate sustainability standards in food supply chains?*
(2) *What are the perspectives of various players in food supply chains related to these CSFs?*
(3) *What research needs to be completed to more fully address and build on this important research concern?*

To address these research questions, the remainder of this paper is organized as follows: Firstly, a literature review on managing sub-suppliers for sustainable (food) supply chains and critical factors is provided. Secondly, theoretically positioning this work within the critical success factors theoretic lens, the present research aims for the identification of CSFs, seeking to extend the theory of critical success factors to supply chain management in general and SSCM for food supply chains in particular. Thirdly, the exploratory field study methodology is presented. Fourthly, the results section describes the identified CSFs for the management of sub-suppliers with linkages to field study empirical evidence that results from two multi-tier supply chains in the food industry. Avenues for further research are proposed throughout. This paper ends with a discussion on research findings, and a provision of managerial implications guiding managers who seek to approach issues beyond the tier-1 supplier level, especially from a sustainability perspective in the food supply chain.

The theoretical contribution of this work includes the use of the critical success factors theoretical lens to understand the issues facing complexity of managing sub-suppliers from a sustainability perspective. From an academic perspective, the identified CSFs can prove useful for scale development and broader research investigation on the role these CSFs have on other organizational practices and performance. Practically, the identification of specific CSFs can be used as a guideline by the food industry, and other industries, to help manage their relationships across multiple tiers of suppliers.

2. Literature review

In this section, the sustainable supply chain management (SSCM) literature is reviewed to provide some foundation for understanding interactions with sub-suppliers. The review is consequently extended to critical factors that either reflect barriers or enabled engagement in SSCM, potentially targeting CSFs for sub-supplier management. Due to the immaturity of the field with respect to managing sub-suppliers and respective CSFs, the review is not limited to food supply chains and initially considers the entire body of SSCM. Sustainable food supply chain idiosyncrasies are highlighted in the review.

2.1. Sub-suppliers in sustainable supply chain management

SSCM literature has extensively investigated managerial practices and relationships between focal firms and their direct suppliers (Brammer et al., 2011; Bai and Sarkis, 2010a). These relationship practices have been classified into two dimensions: assessment and collaboration (Vachon and Klassen, 2006, 2008; Klassen and Vachon, 2003).

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