Networking towards environmental sustainability in green supply chains and networks: findings in sustainability reporting

WORK IN PROGRESS

ABSTRACT

Responsibility for sustainability actions stretches beyond the focal firm's internal organization to include supply chains and the wider network. In relation to this, sustainability reporting is gaining an increasing importance and has become mandatory for firm's exceeding 250 employees or a turnover over 36 million Euros. The majority of research in the field of sustainability and the greening of supply chains cover dyadic relationships between two business partners. The paper contributes to current research by applying an industrial network perspective of interaction covering the entire supply chain and the wider network in which the firms operate. The aim of the paper is to investigate firms' efforts with regard to supplier interaction in order to greening their supply chains and improve their environmental sustainability. A framework in relation to networking that covers: behavior in existing relationships; position as a combination of relationships; and intentional behavior, is used to scrutinize this issue. Data collection rests on the sampling of firms based on a Swedish sustainability report award, where seven rewarded firms' sustainability reports are investigated. This investigation identifies six areas that covers networking and interaction: relationships/partnerships; supplier development, supplier training, collaborative sustainable efforts; supplier sustainability index; transport and purchase of transport services; purchasing, audits, assessments; and compliance of sub-suppliers. Our findings show that networking via interaction is important in efforts of greening, aiming at influencing not only contracted suppliers but also the wider network through interaction directed towards the industry. In this interaction, extensive communication between actors are crucial to enable implementation of new initiatives. In addition, the support of the buying firm (correlating to the firms of who's' reports we have studied) appears to be crucial to enable the transition towards environmental sustainability in supply chains and the wider networks. With regard to 'who reports', the study reveals that the focal firm's position in the supply chain, ranging from raw material suppliers to the final consumers, affect the content of what is reported as environmentally sustainable efforts.

Key words: sustainability, environmental, interaction, networking, supply chain, supply network

INTRODUCTION

Firms are under growing pressure to take responsibility for sustainability actions, not only within their own organization but also within their supply networks through the implementation of sustainable sourcing (Schneider & Wallenburg, 2012; Young & Kielkiewicz-Young, 2001). In order to succeed, firms need to collaborate with their suppliers, not only with first-tier suppliers, but with their whole supply chain network. The increase in specialization implies that firms rely more extensively on sourcing of components and competence, wherefore it is ever more important to incorporate sustainability in the interaction with suppliers. Association with sustainably responsible suppliers is crucial as the public view on the supplier is reflected on the buying firm. Thus, purchasing, together with contexts in relation to product design, process design and manufacturing practices, are parts of firms' efforts of 'greening' their supply chains (Hervani et al., 2005). Sustainable supply chains and networks are hence in focus as firms strive to calculate their products' global footprints, conducting LCAs and demonstrating how they are putting efforts into being more environmentally sustainable. Attributing performance results to one particular entity is challenging, and even more difficulties arise in inter-organizational environmental performance measurement (ibid.), thus, greening the supply chain is complex and challenging due to many sub-suppliers and the need for transparency. The majority of research has also been on dyadic relationships but there are fewer studies of supply chains involving more than two parties or supply networks that cover the total supply base (Melander, 2017).

In relation to the growing pressure on firms to improve their sustainability efforts, the new EU directive from 2017 makes sustainability reporting compulsory for firms exceeding 250 employees or a turnover over 35 million Euros. As a result, about 1600 Swedish firms have become obliged to report their sustainability efforts. A large number of studies focus on sustainable supply chains by investigating sustainability reports (see e.g. Albino et al., 2009; Kolk, 2003; Meckenstock et al., 2016; Tate et al., 2010; Turker & Altuntas, 2014). Four main research streams are identified: 'who' discloses, the content in the reporting, 'how' firms report and, the assessment of environmental performance (Jose & Lee, 2007).

Large Swedish firms are on the forefront of sustainability efforts and sustainability reporting (Arvidsson, 2010; Arvidsson, 2017), making them suitable for studying the greening of supply chains as the reports must cover not only the firms' efforts to become more sustainable internally but also, in relation to their supply chains. Our study focuses on firms' supply chain efforts and interactions with suppliers addressed in sustainability reporting in order to become greener with regard to environmental sustainability. Sustainability also involves other aspects, such as social sustainability, however, this out of the scope of the paper. The sampling of firms and their respective supply chains is based on a Swedish sustainability report award; thus, the awarded firms are considered to be in the forefront of sustainability reporting. The aim of the paper is to investigate firms' efforts with regard to supplier interaction in order to greening their supply chains and improve their environmental sustainability. Thus, the paper discloses the content in sustainability reporting with regard to purchasing and supply networks. We believe it to be fruitful to investigate interaction in green supply chains and networks by using the industrial network approach (INA) to analyze how firms interact in these collaboration settings, based on their sustainability reporting. The INA theories have been extensively used in analyzing collaborations and interaction between buyers and suppliers (Gadde et al., 2010; Håkansson et al., 2009).

THEORY

The industrial network approach identifies interaction as an important ingredient in building relationships and creating networks. Taking an interactive view of business relationships means that it is not sufficient to look at a single firm, but rather that we need to look at interactions between firms (Ford & Håkansson, 2006). A number of IMP studies point to the importance of interaction, for instance, with suppliers for innovation (Andersen & Gadde, 2018; Gadde et al., 2010; Håkansson & Waluszewski, 2013; Perna et al., 2012) and customers for innovation (see e.g. Harrison & Waluszewski, 2008; Havenvid et al., 2016; Laage-Hellman et al., 2014). Interaction happens between two parties as well as across entire networks and also, interaction evolves over time and is shaped by previous as well as on-going interactions. The position of a single firm is determined by its interaction with other parties, wherefore a firm's interaction with other actors, such as suppliers, affects what can be accomplished (Gadde et al., 2010). Accordingly, in ambitions of improving environmental sustainability firm's accomplishments are intertwined with other actors' efforts, sometimes enabled through interaction, sometimes spread by interaction. Thus, interactions affect firms and firms are affected by interaction, and every interaction is part of a larger interaction pattern (Håkansson & Waluszewski, 2013). For instance, Havenvid et al. (2016) show that customers' requirements are not developed in isolation by the individual customer, but results from interactions in a network. Other studies show that for complex innovations firms need to develop interactions with a number of actors, such as customers, suppliers, users and even competitors (Baraldi et al., 2011; Perna et al., 2012).

In their discussion about interaction, Ford and Håkansson (2006) point out that interaction includes interpersonal communication, delivery of products and services, information, payments and one-sided observations. Due to increased technological development, firms cannot have knowledge in-house, but need to collaborate with expert suppliers and customers to innovate new offerings. This increased interdependence between firms results in even more complex interactions (Ford & Håkansson, 2006). Exploration of how firms interact with suppliers in supply chains and the wider network towards environmental sustainability thus require capturing: complex interaction patterns; requirements; communication; and delivery of products and services.

In the interactive business world, interaction is the way firms seek to achieve their aims. *Networking* as the conscious attempts to affect interaction becomes the core of management. In order to scrutinize environmental sustainability efforts via interaction we rely on Håkansson et al.'s (2009) identification of networking options in terms of *behavior in existing relationships*, *the position with regard to a combination of relationships*, and *intentional behavior*. Behavior in existing relationship involves *conforming* when keeping the status quo and *confronting* as to seek specific changes in relation to business partners. The position as a combination of relationships implies *consolidating* as to maintain the current network position by developing involvement in existing relationships and *creating* by building new relationships or altering the balance between existing relationships. Intentional behavior captures *coercing* as attempts to influence and *conceding* when instead following the intents of others.

In relation to sustainability reporting in terms of interaction and the networking of firms in their strive for environmental sustainability through the greening of the supply chains the following research issues are identified:

RQ1: How are the behavior in existing relationships in relation to business partners affecting environmental sustainability and what affects can be identified?
RQ2: What efforts are made by firms in relation to their position with regard to a combination of relationships as to improve environmental sustainability?
RQ3: How are environmental sustainability improved by intentional behavior as a consequence of efforts in firm's direct supply chains and the wider supply network?

METODOLOGY

The main data for this study is published sustainability reports from seven large Swedish firms. The sampling of firms is based on a sustainability report award, where a jury considers reports from firms on the Swedish OMX stock market. This is a Swedish awards, called "Årets bästa hållbarhetsredovisning" conducted by Aktuell Hållbarhet (2017). The criteria for judging the sustainable reports are: explicitness, business utility, societal utility, long-term, trustworthiness and, totality (relevant information). The sampling of firms in this study is based on the top nomination 2016: Volvo group, IKEA and Boliden, and 2017: Electrolux, BillerudKorsnäs, Axfood and Husqvarna. See Table 1 for an overview of the firms in our study.

Table 1 – Firm information

	Axfood	BillerudKorsnäs	Boliden	Electrolux	Husqvarna	IKEA	Volvo group
Industry	Food retail	Packaging	Metals	Appliances	Outdoor power products	Home furnishing retailer	Transport Solutions
Turnover	43 bn SEK	21.7 bn SEK (net sales)	40 billion SEK	121 bn SEK (net sales)	36 bn SEK (net sales)	35,1 billion EURO	302 billion SEK
Number of employees	9 000	4 300	5500	55 400	13 000	163 600	95 000

By studying the sustainability reports we investigate the ambition to improve environmental sustainability in the development of green supply chains through the interaction with suppliers. It should be noticed that sustainability reporting encompasses other dimensions of sustainability, such as social sustainability, however, this is out of the scope of our study. We collected data through the scrutinization of the published sustainability reports focusing on environmental efforts in relation to the supply chain and purchasing and structed the data into a large database, displaying them in mega matrices (Miles & Huberman, 1984). Thereafter we analyzed the data through the theoretical lens of INA focusing on networking in supplier interaction.

FIRMS IN THE STUDY

Axfood operates in the Swedish food retail and was established the year 2000. It is Sweden's second largest food retailer. Sustainability is an important aspect of Axfood's business model and the firm's ambition is to be the industry leader in sustainability. Axfood started publishing its sustainability reports online 2013.

BillerudKorsnäs belongs to the packaging industry. There are three cornerstones to the Group's offering: packaging materials made from primary fibre, innovative packaging solutions and a global network of partners. BillerudKorsnäs is a leading firm in primary fiber-based packaging materials and solutions Billerud and Korsnäs were merged 2012, and has experience of on more than 150 years in the forestry and paper industry. The headquarter is situated in Sweden and

the production facilities are located in Sweden, Finland and the UK. Customers are located in over 100 countries. BillerudKorsnäs has sustainability reports from 2013 published on their website.

Boliden is a metals firm within the fields of exploration, mining, smelting and metal recycling and operates six mining areas and five smelters in Sweden, Finland, Norway, and Ireland. Accordingly, Boliden extracts minerals and produces high-quality metals, which are mainly sold to industrial customers in Europe. Significant investments have been made in the recycling industry and Boliden is today among the largest electronic scrap recycles in the world. The firm was founded in 1924. Sustainability reports from 2015 are available on Boliden's homepage.

Electrolux is a global producer of appliances and has been doing business since 1919 with its headquarter located in Sweden. Electrolux sells more than 60 million household and professional products in more than 150 markets. The group operates on the global market but western Europe is the Group's largest market for consumer durables and professional products. Sustainability reports from 1995 are available on Electrolux's homepage.

Husqvarna is a leading producer of outdoor power products. Huskvarna group has four divisions; Husqvarna division, consumer brand division, garden division and construction division. The group has operations in 40 countries. Husqvarna provides sustainability reports from 2010 on their homepage. The first Husqvarna plant was established in 1689.

IKEA was founded as a furniture firm in 1943. As of today, IKEA has become a major global retailer and in FY16 (Financial year 2016: the period between September 1, 2015 to August 31, 2016.) the IKEA group comprised of 340 stores in 28 countries, 22 pick-up and order points in 11 countries, 41 shopping centres in 15 countries and 38 distribution sites in 18 countries, and EURO 34.2 billion sales and EURO 4.2 billion net profit. Online sales across 14 markets added up to EURO 1.4 billion sales. IKEA states that sustainability is an integral part of their growth agenda and each product is designed to be beautiful, functional, high-quality, affordable and sustainable. Through the sustainability strategy, People & Planet Positive, IKEA aims to make a positive difference for people and the environment and to use its influence as a global firm to face some of the greatest social and environmental challenges. The IKEA Group publishes sustainability reports since 2012 on the website. IKEA is signatory to the United Nations Global Compact and reports its progress in the 10 principles of human rights, labour, environment, anti-corruption. IKEA also reports on their efforts in accordance with the United Nations 17 Sustainable Development goals (SDGs).

Volvo was founded in 1927 and today the Volvo Group has six business areas: Trucks (66%), Construction Equipment (17%), Buses (8%), Marine and Industrial Engines (3%), Financial Services (4%) and Other (2%), that jointly consists of 11 brands. In 2016 Volvo Groups had production facilities in 18 countries and sold its products in more than 190 markets. Turnover FY 2016 corresponds to 302 billion SEK. The Volvo Group publishes sustainability reports from year 2007 on the website.

PRELIMINARY RESULTS

Sorting the information in the sustainability reports with regard to supply chain interaction and network initiatives reveals that the reports vary in content regarding supplier issues related to environmental sustainability. We identify the following six areas:

- Relationships/partnerships
- Supplier development, supplier training, collaborative sustainable efforts

- Supplier sustainability index
- Transport and purchase of transport services
- Purchasing, audits, assessments
- Compliance of sub-suppliers

Table 2 below illustrates the content in regard to these areas in respective sustainability report.

Table 2 – Identified supplier interaction with regard to environmental sustainability. (Note! Table to be filled with content as analysis!)

	Axfood	BillerudKorsnäs	Boliden	Electrolux	Husqvarna	IKEA	Volvo group
Relationships/ partnerships							
Supplier development, training, collaborative efforts							
Supplier sustainability index							
Transport and purchase of transport services							
Purchasing, audits, assessments							
Compliance of sub-suppliers							

Our findings point to that the industrial network approach is useful to analyze collaborative supply chains and networks aimed towards improved environmental sustainability. Applying this perspective enables scrutinization of the greening of supply chains and networks beyond the dyadic relationship of customer and first-tier suppliers. The paper shows that firms display complex supply interaction patterns in their sustainability efforts. The firms within a wide range of industries in our study demonstrate a variance of interactions in supply chains and networks towards improved environmental sustainability. The wide spread of firms, industries and positions in the supply chain network in our sample demonstrates the complexity of analyzing interaction in supply chain networks aimed towards environmental sustainability. Such investigation of industry differences has been called for in previous research (Hervani et al., 2005).

Depending on where the focal firm is placed in the supply chain, and if interaction towards customers involves consumer or industry products, the firm has different strategies and priorities towards suppliers. Firms with consumer products operating upwards in the supply chain, such as Axfood and IKEA, report on their networking behavior towards suppliers extensively including efforts of encouragement and certification in existing relationships. These firms play very active roles with extensive collaboration with suppliers and the wider network, including industry initiatives. In contrast, Boliden as a mining firm operating in the very beginning of the supply chain sourcing raw materials from mines and providing industry products mainly describes company internal efforts directed towards environmental sustainability and less collaborative efforts with regard to sustainability in their supply chain.

Behavior towards suppliers mainly concerns assessment. The way these firms conduct their sustainability collaboration with suppliers is thus different, which is mirrored in their sustainability reports. Thus, with regard to 'who reports' as commonly addressed as an important parameter in sustainability reporting, the focal firm's position in the supply chain affect the content of 'what' is reported in terms of networking with suppliers.

In terms of intentional behavior all firms in the study report on efforts to influence their respective industry by various initiatives as to improve environmental sustainability. Such efforts include being an environmental role model, encouragement of assessment and certification towards all industry actors.

One important finding identifies that suppliers are certainly not only delivering products and services as a response to demanding customers with pre-defined requirements. On the contrary, suppliers take responsibilities in innovation efforts, new designs and partaking in new business models. Our study reveals that the greening of supply chains thus requires interaction in supply chains as well as in the wider perspective of supply networks among many actors. In this interaction, extensive communication between actors are crucial to enable implementation of new initiatives. In addition, the support of the buying firm (correlating to the firms of who's' reports we have studied) appears to be crucial to enable the transition towards environmental sustainability in supply chains and the wider networks.

To our knowledge this is the first study that combines sustainability report data and the INA theories to analyze environmental sustainability efforts in supply networks. Thus, our study brings novelty in applying INA theories on sustainability report data. This is a work in progress and we aim to further expand our study by adding interviews with the firms to access more in-depth information about firms' interactions with suppliers aiming towards increased environmental sustainability. We aim to move forward with our study and dig deeper into the question of how interactions in supply chain networks contribute to environmental sustainability and how these initiatives are accounted for in sustainability reporting.

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