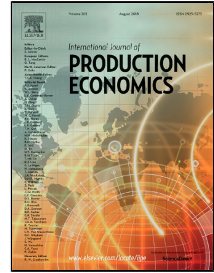


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Multi-tier sustainable supply chain management: The role of Supply chain leadership

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**Multi-tier sustainable supply chain management:  
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## **Sustainable multi-tier supply chain management: The role of supply chain leadership**

### **Abstract**

Sustainable Supply Chain Management (SSCM) has been considered increasingly important by both industry and academia in recent years. Among the main streams of SSCM research, little is known on how multi-national corporations (MNCs), assuming leadership in their supply chain, have been able to facilitate their supply chain members to learn sustainability practice in an emerging economy context. To answer this research question, a multiple-case study was designed. Multi-tier supply chains of three MNCs were selected to investigate their proactive sustainability projects in China. A framework was proposed based on the constructs of supply chain leadership, multi-tier supply chain governance, multi-tier supply chain structure and supply chain learning. We found that the combined effect of supply chain leadership and governance mechanisms affects both supply chain structure and supply chain learning and MNCs change their supply chain structure to facilitate supply chain learning. Three sets of propositions are advanced and implications for future research are elucidated.

**Keywords:** Sustainable supply chain management, multi-tier supply chain, supply chain leadership, supply chain learning

### **1. Introduction**

Since the early 2000s, Sustainable Supply Chain Management (SSCM) has drawn much attention from both industry and academia alike. Organizations review their products and processes in order to deliver more environmental friendly products and services. A high number of papers have been published to follow the trend (Seuring, 2013). Of the SSCM research, existing literature is focused on building the definitions of SSCM - defining SSCM and building the related roadmaps and frameworks (Carter and Rogers, 2008; Seuring and Muller, 2008); some start looking at the implementation of SSCM (Lam, 2011; Walker and Jones, 2012); while others discuss the strategies of SSCM (Seuring and Muller, 2008; Harms *et al.*, 2013). Most authors focus their discussion on the enablers and barriers for organizations implementing SSCM (Seuring and Muller, 2008; Walker *et al.*, 2008; Gimenez and Tachizawa, 2012; Walker and Jones, 2012; Harms *et al.*, 2013). Some focus the debate on SSCM governance mechanisms (Mamic, 2005; Gimenez and Tachizawa, 2012); others consider the decisions to pursue sustainability in a complex and uncertain environment (Pagell and Wu,

2009; Wu and Pagell, 2011).

In recent years, the research interest in SSCM has shifted from focusing on focal companies to Tier 1 suppliers (Wilhelm *et al.*, 2016a, b) and multi-tier supply chains (Mena *et al.*, 2013; Grimm *et al.*, 2014; Tachizawa and Wong, 2014). However, among these studies, very few contributions (e.g. Defee *et al.*, 2009a, b; 2010; Gosling *et al.*, 2016) focus on the role of supply chain leadership in the implementation of sustainable initiatives in a multi-tier SSCM context, although organization leadership is believed to be vital to win competitive advantage. Biotto *et al.* (2012) provide a single case study of Illycaffè Group, focusing on quality oriented supply chain learning where Illycaffè played a supply chain coordinator role (and a leader role) in order to efficiently and effectively manage quality along the whole supply chain. They conclude that the coordination of supply chain learning needs substantial effort and resource commitment from the leader organization (*ibid*).

We study the MNCs' SSCM practices in China because China is the 'factory of the world' (Harney, 2008) and is still one of the most rapidly developing centres of production in the world (Biggermann and Fam, 2011). On the other hand, China has also been the 'largest carbon emission country' and 'largest energy consumer country' (Chinese Academy of Sciences, 2012). Since academic and anecdotal evidence show that MNCs are leaders of their supply chains in China, many Chinese suppliers and customers are attempting to learn sustainability initiatives of MNCs. Thus, to address the gaps in the literature (lack of answer to how to implement and lack of research on SSCM in multi-tier supply chains), we attempt to explore the below research question:

*“What role does MNC's supply chain leadership play in learning of sustainability in multi-tier supply chains?”*

We attempt to draw insights from emerging areas of research in SCM, namely: multi-tier SSCM, supply chain leadership; and supply chain learning for the investigation of the topic. To the best of our knowledge, there is no previous research studying SSCM through the lenses of supply chain leadership and supply chain learning in a multi-tier supply chain context (Gosling *et al.*, 2016).

This research contributes to the SSCM literature in the following ways: *first*, it may be the first empirical attempt that applies both supply chain learning and leadership lenses to investigate SSCM and to answer the research question of how to implement sustainable initiatives. This helps to explain how MNCs implement sustainable initiatives in China; *second*,

this research enriches our understanding of the role of organisational leadership in MNCs' SSCM, in particular the role of supply chain leadership in the leaning of sustainability; *third*, the research contributes to the multi-tier supply chain management research through adopting new lenses of supply chain leadership and supply chain learning.

After this introduction, section 2 provides a literature review on the research that has been undertaken on the key concepts; section 3 presents the case study research method; section 4 and 5 present the within and cross case analysis of the three cases regarding the similarities and differences and identifying patterns; section 6 discusses the case findings against the reviewed literature and develops a number of propositions; Finally, section 7 summarizes theoretical and practical contributions, acknowledges limitations of the research and indicates potential research directions.

## 2. Literature review

In this section, we review the concepts of SSCM in multi-tier supply chains, supply chain leadership and leadership's role in supply chain learning respectively.

### 2.1 SSCM in multi-tier supply chains

This section presents the literature review on SSCM with a focus on multi-tier supply chains. The most cited definition of sustainable supply chain management (SSCM) so far is by Seuring and Muller (2008, p. 1700) **and we also adopt it in this research:**

*“The management of material, information and capital flows as well as cooperation among companies along the supply chain while taking goals from all three dimensions of sustainable development, i.e., economic, environmental and social, into account which are derived from customer and stakeholder requirements.”*

The above definition indicates that, in order to create a SSCM, focal companies not only need to be sustainable themselves, but also to ensure their supply chain members to be sustainable. The recent interest in multi-tier SSCM reflects this character (Mena *et al.*, 2013; Grimm *et al.*, 2014; Tachizawa and Wong, 2014; Wilhelm *et al.*, 2016a, b).

Mena *et al.* (2013) carry out a case study of three-tier supply chains and summarize the approaches, through which focal companies work with Tier 1 and Tier 2 suppliers, reflected in three types of multi-tier supply chain structures: open triad, transitional triad and closed triad. They also suggest that the forms of triad are linked with management resources (e.g.,

investments of time and money) i.e., an open triad requires fewer management resource; a closed triad require additional resources (ibid).

Tachizawa and Wong (2014) further develop Mena *et al.* (2013) to a SSCM context by reviewing 39 papers with the focus on lower-tier suppliers. They propose that there are four governance mechanisms i.e., “direct”, “indirect”, “work with third party” and “don’t bother” for focal companies working with lower tier suppliers on SSCM.

In terms of the learning in SSCM, Carter and Rogers (2008) suggest that learning, concerning environmental and social activities between suppliers and buyers, can lead to competitive advantages. Vachon and Klassen (2008) find that supply chain learning is embedded in environmental collaboration with primary suppliers and major customers, which can have a significant positive impact on both manufacturing and environmental performance.

On the other hand, SSCM literature also suggests the importance of the leadership role of focal companies. Vachon and Klassen (2006) suggest that supply chain leaders can either invest their own resources or use arms-length market mechanisms to influence other supply chain members to participate in green supply chain management. Defee *et al.* (2009a) further argue that supply chains are a complex organizational network, which requires the leadership from supply chain leader organizations to drive changes for the whole chain. Transformational supply chain leadership are more acceptable to members and more likely to encourage change, if it can enhance the development of closed-loop supply chain orientation (ibid).

## 2.2 Supply chain leadership

Some early researches in operations and supply chain management have paid attention to the concept of leadership at an organizational level, although they tend to discuss power and leadership interchangeably. The term, Power, has been introduced in market channel literature to describe how any industry is probably dominated by two or three major competitors (Daugherty, 2011). The classic works are assuming supply chain leaders as those who have the disproportionate power and ability of powerful organizations to dominate other supply chain organizations. For example, Hall (2000) claims that power can be applied by channel leaders to influence suppliers toward sustainability. The exercise of power or lack of power can affect the level of commitment of other channel members; however forced participation will encourage exit behaviour if given the opportunity (Cooper *et al.*, 1997). Cox (2001) and Cox *et al.* (2004) discuss the different types of power relationships between buyers and suppliers.

In SSCM studies, Ahi and Searcy (2013) stress the voluntary character of SSCM and claim that power may not be able to fully explain proactive SSCM behaviours. Focal companies

collaborate with suppliers on SSCM initiatives, in which suppliers may be driven by leaders' sustainable vision, which is viewed as a characteristic of leadership (Ahi and Searcy, 2013). Echoing this, Defee *et al.* (2009a) argue that power should not be viewed as the sole source of supply chain leadership because other aspects of leadership such as leadership styles should be taken into consideration especially within the SSCM context. Recently, Blome *et al.* (2017) conducted research on ethical leadership and proposed that ethical leadership (i.e., transformational leadership) has a positive impact on green supplier championing behaviours; and that suppliers have been proactive in sustainability and tend to further disseminate the sustainability to upstream supply chain. It seems that power and leadership are two interrelated constructs in a way that leadership is built on power. However, this is not entirely clear in the literature. In addition, Lambert *et al.* (1998) point out that unless one organization adopts the leadership role to take responsibility for strategic supply chain decisions, supply chain risk will occur and lead to a stage of chaos. Defee *et al.* (2009a) may be the first to strongly argue that leadership can be applied to supply chain organizations and describe the relationship between a supply chain leader organization and other supply chain member organizations.

Traditionally, leadership focuses on individuals and various leadership theories have been developed, including trait theories, behaviour theories, situational theories, contingency theory, leader-member exchange (LMX) theory and multifactor-leadership theory (Yukl, 1998). Traits are the attributes that include aspects such as values, needs, motives and personality; behaviour theories focus on what leaders do and how they act to influence their subordinates; situational theory of leadership is developed from behaviour theory and argues that leadership should change according to different situations; contingency theory of leadership is assuming that leaders styles are relatively stable and need to be matched with the most appropriate situation; leader-member exchange (LMX) theory focuses on the dyadic relationship between a leader and each of his/her followers (Yukl, 1998).

Multifactor leadership theory has been the most widely discussed and applied leadership theory, which consists of transformational leadership style and transactional leadership style (Defee *et al.*, 2009a). This is adopted in this study. Bass (1985; 1990; 1999) builds the framework for transformational and transactional leadership, which has subsequently been operationalized by Avolio *et al.* (1999). Transformational leadership focuses on transforming followers' self-interest to the collective interest, while transactional leadership maintains that the traditional leadership focus on contract or agreement, built upon exchange and is task driven.

Here, Defee *et al.* (2010) focus on leadership at an organizational level rather than an individual level that how organizations influence other supply chain organizations. They

propose a formal definition on supply chain leadership, which we also adopted in this research (Defee *et al.*, 2010, p.766),

*“[...] a relational concept involving the supply chain leader and one or more supply chain follower organizations that interact in a dynamic, co-influencing process. The supply chain leader is characterized as the organization that demonstrates higher levels of the four elements of leadership in relation to other member organizations (i.e., the organization capable of greater influence, readily identifiable by its behaviours, creator of the vision, and that establishes a relationship with other supply chain organizations).”*

Defee *et al.* (2009b) further explore the leadership styles and argue that transactional leadership demonstrates contingent reward and management-by-exception, while transformational leadership exhibits inspiration, intellectual stimulation and individualized consideration more frequently. Transformational leaders focus on developing long-term relationships and do not seek to control followers' behaviour through the use of contingent rewards but manage in a more holistic way (Avolio *et al.*, 1999; Bass, 1985).

Defee *et al.* (2009a, p.93) further explain that *inspiration behaviour* as a mission and vision of a desirable future and the definition of the path to achieve the vision; *intellectual stimulation* indicates leaders calling on followers to be more innovative and creative to provide better solutions to problems; *individualized consideration* means a leader's ability to recognize each individual follower's unique skills and development needs (ibid). Transactional leadership on the other hand, contains two dimensions: *contingent reward* indicates that followers will be rewarded on their expected performance and be punished if a target is not achieved; *active management by exception* asserts that leaders point out followers' mistakes and take actions when needed (ibid).

Research on supply chain leadership is limited especially at an organizational level. Harland *et al.* (2007) and Overstreet *et al.* (2013) suggest that there is a dearth of publications and empirical studies devoted to leadership in the supply chain domain. The possible explanation for the lack of study is that leadership is a mature but complex discipline and has been studied at an individual level, with the application to supply chain management and at an organizational level makes the research even more complex (Gosling *et al.*, 2016).

### 2.3 Leadership's role in supply chain learning

Supply chain learning derives from inter-organizational learning, whereby organizational



members act jointly to create collective knowledge and it is a process through which network actors learn to collaborate, share and create knowledge (Mariotti, 2012). Grounding their work in innovation literature, Bessant *et al.* (2003) consider supply chain learning a process and divide it into three phases, i.e., the first phase is ‘set up’ which is for establishing a set of procedures to promote supply chain learning; the second phase is ‘operating’, which is to translate the procedures to routines and norms governing the behaviour between and within firms; the third and final phase is ‘sustaining’, which is to deal with management processes for the needs of continuous learning such as measurements and benchmarking.

Supply chain learning is closely related to supply chain leadership. Among the studies of supply chain learning, several authors mention the role of a leader in the learning process. Hult *et al.* (2000) find that transformational leadership has a positive effect on organizational learning (corporate buyers and internal users) in a purchasing and supply context, which in turn has a positive effect on information processing and cycle time of purchasing process. Bessant *et al.* (2003) notice the importance of the leader role; leadership roles may change over the learning stages that the focal firms need to play a leader role at the set up stage, whilst at the sustaining stage, supply chain members may need to share the leadership role, i.e., be responsible for themselves or sub-tier suppliers.

Lambrechts *et al.* (2012, p. 628) take a view on in-depth joint supply chain learning, which is defined as “*building the capacity to create new knowledge and possibilities together through a process where actors can learn collectively on how to rethink and renew their supply chain framework.*” It emphasizes that a strong single party cannot succeed in in-depth joint supply chain learning without other parties’ involvement and contribution. This kind of learning needs time, effort and discipline and it is necessary for the leader to assume a facilitator role; learning will not occur itself but needs careful design and facilitation (Lambrechts *et al.*, 2012). Similar to Bessant *et al.* (2003), to be more effective, the leadership role may change over time from an ‘up-front role’ to a ‘stand-back’ role in which other members actively take part (Lambrechts *et al.*, 2012).

Gosling *et al.* (2016) may be the first study integrating supply chain learning, supply chain leadership and SSCM and propose, conceptually, that supply chain leadership styles of transformational and transactional leadership may have an influence on supply chain learning of sustainability. The paper is conceptual in nature and needs further empirical work to validate the framework.

After reviewing the above papers, it was found that further studies on the interrelationship between supply chain leadership and supply chain learning are needed. For example, such

questions as “*who emerges as the facilitative leading role, and when and how does leadership develop over time?*” remain not answered (Lambrechts *et al.*, 2012, p.633).

### 3. Research Methodology

In order to answer the research question, a multiple case study research method was applied. “A case study is an empirical enquiry that investigates a contemporary phenomenon within its real life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2008, p.13). Given the fact that limited research has been done on SSCM adopting supply chain leadership and supply chain learning in a multi-tier SSCM context, it is, therefore, appropriate to explore the research question using a multiple case study method. Our research adopted the suggestions and processes to conduct case study research to ensure a rigorous process (Stuart *et al.*, 2002; Voss *et al.*, 2002; Holton, 2007; Ketokivi and Choi, 2014).

#### 3.1 Case Selection

Western MNCs operating in China were selected for this research. The unit of analysis of this research is a sustainable initiative led by Western MNCs covering at least two tiers of suppliers. Thanks to a partnership with WWF (World Wide Fund for Nature), WWFs’ MNCs partners were chosen as the sample pool. WWF tends to collaborate with influential industry leaders who assume as supply chain leaders and exemplars in SSCM.

To answer the research question, our research followed a theoretical sampling approach. The following criteria were applied for selecting the MNCs:

- Western MNCs that have an established corporate sustainability strategy;
- Western MNCs that have localized manufacturing and supply chain operations in China;
- Western MNCs that conducted proactive sustainable initiatives covering a supply chain of multiple tiers (at least two tiers of suppliers).

The proactive sustainable initiatives are defined as activities going beyond compliance with government and any other third party organization requirement and show proactivity and importance to the focal companies concerned. Besides the above criteria, focal companies should be able to provide access to supply chain members in at least two tiers of suppliers and these companies and their suppliers should also be willing to participate in this research. In total seven companies were approached for data collection initially. Cover letters explaining the research purpose were sent to the executives with five agreeing to participate. Another two

out of the five companies were further dropped because proactive SSCM initiative could not be found in one and another one could not provide access to suppliers due to organization structure change.

Finally, the three companies that remained are Tetra Pak, Nestlé, and IKEA. The proactive sustainable initiatives selected for each company are: Tetra Pak creating a recycling chain in China, Nestlé's modernizing dairy farmers in China and IKEA promoting sustainable cotton. The basic information of the three companies are summarized in Table 1.

--- Insert Table 1 here ---

For the three multi-tier supply chains, the unit of analysis for Tetra Pak is its recycling chain and for Nestlé and IKEA the unit of analysis is their whole upstream supply chains. After identifying focal companies and their proactive sustainable initiatives, suppliers were further selected to represent different types. For instance, Tetra Pak's recyclers were selected based on different recycling technologies (e.g. Polyol's separation technology, plastic-wood technology). The field visits of Nestlé's dairy farmers were selected based on Nestlé's internal grading (e.g. A, B, C). Finally, IKEA's suppliers were selected based on the level of vertical integration: from fully vertically integrated to multi-tier supply chain with suppliers covering all the stages of cotton-textile supply chain.

### 3.2 Data Collection

Semi-structured interviews were conducted as the primary data source. Eisenhardt and Graebner (2007) suggest that interviews are a highly efficient way to gather rich, empirical data especially when the phenomenon of interest is highly episodic and infrequent, which are tacitly stored in interviewees' minds. To reduce respondents' bias, multiple interviewees with knowledge of the sustainable supply chain initiatives were interviewed from multiple perspectives. Data from multiple sources provide the opportunity to triangulate the information collected (Eisenhardt, 1989).

In total, 43 quality interviews were finally used here with a focus on the three sustainable initiatives. A summary of the interview list is in Appendix A. An interview protocol was customized for each company and as a guidance for these interviews (see Appendix B). All the interviews were conducted by one of the co-authors.

Three rounds of data collection were carried out between late 2014 and early 2016. The first round of data collection was carried out between September and October 2014 with a focus

on the senior executives of each focal company on the overall sustainability strategy and to identify sustainable initiatives covering multi-tier suppliers. Suppliers were also interviewed for Tetra Pak. The second and major round of data collection was conducted between April and May 2015. Finally the third round data collection (additional interviews) was carried out between November 2015 and January 2016. Some further questions were asked by telephone calls or emails after the three waves.

In total 43 interviews were conducted with eight focused on Tetra Pak, 13 on Nestlé and 22 on IKEA. The majority of interviews were conducted in Chinese Mandarin, with two in English. All the interviews were recorded except for one in which the interviewee did not agree to be digitally recorded. Notes were taken for this interview. 37 of the interviews were conducted face to face in 11 cities (as in Figure 1), and six interviews were conducted via telephone either due to distance or interviewees' time schedule conflict. Notes were taken during all of the interviews to record reflections and observation during field visits.

---- Insert Figure 1 here ----

All the cases of IKEA, Nestlé and IKEA were interviewed for their whole multi-tier supply chains. An NGO (i.e., Better Cotton Initiative) was also interviewed for the IKEA case. The distribution of the interviews at different tiers are summarized in Table 2. The average length of the interviews with focal companies lasted for around 60 minutes, while the length with suppliers lasted for around 50 minutes.

--- Insert Table 2 here ---

The interviews stopped when a theoretical saturation was reached, i.e., further interviews would not provide new information to the understanding of the research question (Eisenhardt, 1989). All the digitally recorded interviews were transcribed into Chinese/English with in total more than 440,000 characters/words. Chinese transcripts were translated into English. One of the co-authors personally transcribed 32 interviews and 10 interviews were transcribed into Chinese by a professional company. The company followed a highly ethical procedure by assigning the transcription of an interview to two or more people to transcribe and finally an administrator integrated the parts together and send it to us.

Besides these formal interviews, a number of informal interviews not included in the 43 were conducted along with the field trips and training sessions. Field visits were paid to Tetra

Pak's three recyclers, ten of Nestlé dairy farms and nine IKEA suppliers (with two Tier 1 suppliers, one cotton farm and six other lower tier suppliers). One of the co-authors -also attended a three-day training session provided by Nestlé to observe the dairy farmers' learning activities.

The data were saved in a database together with any digital information provided by the interviewees. Photos were taken and kept as reminders of the field experience and to provide a different data source. Archival data were also extensively collected including company websites, news coverage, internal company documents and public corporate social responsibility reports. Multiple sources of data are recommended for case study research as a way for triangulation. These sources provide the corporate sustainability strategies and the initiatives' background and compliment the formal interviews.

### 3.3 Coding and Data Analysis

After data collection, data were coded and analysed. Based on Miles *et al.* (2013) within-case analysis was first conducted, followed by the cross-case analysis. In order to strengthen the validity of the analysis results, a copy of the within-case report was sent to the senior executives of each focal company to get feedbacks, check accuracy and obtain ethical approval (of using their real names in publications). The cross case results were iteratively discussed among the co-authors who were not involved in the data collection and played a "resident devil's advocate" role to bring a more objective view (Sutton and Callahan, 1987).

#### 3.3.1 Coding and analysing

Similar to Pagnell and Wu (2009), coding was applied only after all data were collected, which is a key way to control for the researcher' bias especially in this research that all the interviews were carried out by a single researcher. The coding was done via an iterative process with both the interview transcripts and secondary data. An open coding process was applied in the first step. Attention was paid to the constructs identified in the literature review of SSCM, multi-tier supply chain governance mechanisms, supply chain structure, supply chain leadership and supply chain learning. For instance, in SSCM, the multi-tier supply chain governance mechanisms were coded according to Tachizawa and Wong (2014) and supply chain structures were coded according to Mena *et al.* (2013). Supply chain learning was coded for the learning stages by Bessant *et al.* (2003). Finally, behaviours by focal companies that could reflect their leadership styles and suppliers' comments on focal companies' leadership behaviours were coded for supply chain leadership.

Next, axial coding was applied to put together the data in new ways. This is applied especially to supply chain leadership constructs. Given the fact that supply chain leadership is an immature concept, the second order constructs of transformational and transactional leadership styles were obtained from previous leadership literatures including Avolio *et al.* (1999), Defee *et al.* (2009a, b; 2010) and Overstreet *et al.* (2013) to code the data. Appendix C list the first and second order operationalised constructs applied to code the focal companies' supply chain leadership.

### 3.3.2 Within case and cross case analysis

Within-case analysis is used to summarize the key data and constructs as objectively as possible for each case. This helps to understand the research question in a single case context. In this research, the within case analyses were conducted to understand the constructs in each case. Cross-case analysis is aimed at identifying the patterns in different settings, which seek to increase the internal validity of the findings, a variety of tools are used to reduce the amount of data and to display the data in a meaningful fashion (Miles *et al.*, 2013). Constructs are then compared among the three cases to identify their similarities and differences. The whole process is an iterative process that simultaneously draws comparisons with the literature, which leads to the development of our final propositions. Finally the whole research was validated according to Yin's (2008) four tests (see Table 3).

--- Insert Table 3 Here ---

## 4. Case descriptions

### 4.1 Tetra Pak

Tetra Pak is the world's leading food packaging company. Tetra Pak realizes the importance of conducting business in a sustainable manner and taking full social and environmental responsibilities. One of its sustainability initiatives is to create a recycling chain in China. In 1998, Tetra Pak China set up its Environmental Department to look into the recycling issue of used beverage cartons (UBC). After investing over 150 million RMB (21.7 million USD) over ten years, Tetra Pak China's recycling chain took shape in 2009. Tetra Pak China underwent three learning stages to implement the project:

- *scanning the recycling market and awareness building and partner selection* - conducting field visits to analyse the UBC recycling routes and market, identifying recycler candidates and persuade them to set up the recycling business;

- *creating recycle capacity* - providing all kinds of support to recyclers including discounted factory material, facility support and management knowledge; and finally
- *securing the recycle capacity* - providing tailored support to each recycler and encourage them to learn from each other and look further for new technology and business development.

In 2015, Tetra Pak China achieved a recycling rate of 28%, which is dramatic when compared to zero 11 years ago.

## 4.2 Nestlé

Nestlé was the world's largest food and beverage company in terms of revenue in 2015. Nestlé emphasises a local sourcing strategy especially in large markets such as China. Over 90% of products sold in China are produced in the country using local raw materials such as coffee beans and raw milk. China's 2008 melamine crisis marked a turning point for China's dairy industry. After this crisis, Chinese Government has been pushing for the consolidation of this industry and favours large scale dairy farms. In order to respond to the Government's call, Nestlé generally followed three learning stages to facilitate the dairy farm transformation process building on the fragmented supply base of small dairy farms:

- *supply chain mapping and awareness building* conducting comprehensive survey with the existing dairy farmers on their willingness and barriers to upgrade and awareness building on both internal staff and external dairy farmers for dairy farm upgradation;
- *capacity building* i.e., offering price differentiation to encourage dairy farmers to upgrade, financial support by liaising with a local bank to provide loans, land use support by working with local government and facility support in terms of discounted facilities and feed; and finally
- *capacity sustaining* i.e., providing continuous training through 'Dairy Farming Institute' (DFI), which was built as an extension service platform.

Nestlé realizes that it does not have expertise in modern dairy farming and consequently it collaborates with various partners (both business partners and academic partners) to create the platform and provide modern dairy farming training to not only Nestlé dairy farmers, but also other dairy farmers nationwide not supplying Nestlé, school students and government officials. The majority of business partners belong to Tier 2 suppliers and have a weak relationship with

Nestlé before implementing the initiative. Due to the small scale, the traditional dairy farmers were not their targeting customers. Now Nestlé creates strong links with these Tier 2 suppliers and provides them market access to the upgraded Tier 1 dairy farms. DFI aimed to be a world class training centre and created many business opportunities for both dairy farmers and the business partners.

### 4.3 IKEA

IKEA is the world's largest furniture retailer. Cotton is the second most important raw material at IKEA after timber. In 2005, IKEA together with other world leading brands and organizations launched a global platform i.e., the Better Cotton Initiative (BCI), which aimed to make cotton production better for the people who produce it, better for the environment it grows in, and better for the sector's future. BCI is a multiple stakeholder NGO funded by large cotton users e.g. IKEA, H&M, GAP and Levi Strauss, has operations in 24 countries and its registered cotton suppliers represent around 12% of global cotton production worldwide. In 2011, IKEA started implementing sustainable cotton initiative in China. A dedicated sustainable cotton team was set up for this purpose. The target of the project was to promote sustainable cotton practices at the cotton field level and IKEA's final products made from cotton were 100% sourced from sustainable cotton sources<sup>1</sup> by the end of financial year of 2015 globally. IKEA China achieved this target one year ahead of its group target at the end of financial year of 2014. The project also followed three learning stages:

- *supply chain mapping and awareness building* i.e., mapping the cotton-textile supply chain to the cotton farm level, holding trainings and workshops with Tier 1 (cutting and stitching) suppliers and some key Tier 2 dyeing and even Tier 3 weaving suppliers;
- *capacity building* i.e., besides providing access to foreign BCI suppliers, getting direct contact with Tier 5 ginner and Tier 6 cotton farmers in China with an aim of implementing the sustainable cotton initiatives to these suppliers and engaging BCI in the cotton farming training;
- *securing the supply chain* i.e., as a promise to BCI, continuously developing Chinese cotton farms.

## 5. Cross case analysis

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<sup>1</sup> Includes Better Cotton, cotton from farmers working towards Better Cotton Initiative standards, and cotton grown to other regional standards such as e3 Cotton Program in the USA.



All the three MNCs can be considered more sustainable than their peers in the three initiatives. This section presents the cross case analysis of the three cases. The similarities and differences are discussed along with four constructs: multi-tier SSCM in terms of supply chain governance mechanisms (Section 5.1), supply chain leadership (Section 5.2), supply chain structure (Section 5.3) and supply chain learning (Section 5.4).

### **5.1 Supply chain governance in multi-tier supply chain**

Vachon and Klassen (2008) highlight the importance of collaboration with suppliers for SSCM. No doubt that in the three cases, MNCs collaborated closely with their Tier 1 suppliers besides the standard approach of assessment (Gimenez and Tachizawa, 2012). Tetra Pak collaborated with recyclers to achieve its recycling target (environmental sustainability). Nestlé collaborated with the dairy farmers to upgrade their farms in order for them to meet Chinese government legislation requirement and supply better quality raw milk (economic and social sustainability). IKEA collaborated with Tier 1 suppliers to achieve 100% of sourcing from more sustainable cotton sources (environmental and social sustainability). The discussion on supply chain governance mechanisms mainly focuses on the three focal companies and their lower or sub-tier (i.e., middle tier and extreme upstream) suppliers.

Tachizawa and Wong (2014) propose conceptually (without any empirical evidence) that in a multi-tier supply chain, focal companies can apply four approaches on their lower tier suppliers: “Direct”, “Indirect” (via Tier 1 suppliers), “Work with third parties” and “Don’t bother”. This research identifies that the case companies applied all the approaches but in a combined and dynamic manner.

Tetra Pak approached directly the collection companies (a way to help recyclers quickly build up recycle capacity) and indirectly with individual collectors through collection companies in the late 2000s, the operating stage. At the sustaining stage, Tetra Pak mainly approached the collection companies both directly and indirectly through recyclers and a ‘don’t bother’ approach with individual collectors. However, Tetra Pak have always approached consumers throughout the three learning stages through a direct approach given the fact that Tetra Pak have more expertise in public relations and have more resources to promote the environmental protection philosophy to the public.

Nestlé approached the DFI partners directly and relied on DFI partners’ knowledge resources to provide training to dairy farmers either within its existing supply chain network of its milk districts or externally to the wider dairy industry including dairy farmers not supplying Nestlé, to school students (providing waste carton) and to local government officials.

IKEA approached the middle tier suppliers (Tier 2-4) by a both direct and indirect approach at the set up and operating stages. It provided training directly to some Tier 2 suppliers along with Tier 1 suppliers while also indirectly approaching some Tier 2 suppliers via Tier 1 suppliers who pass on information and requirements. For Tier 3 and Tier 4 suppliers, IKEA mainly adopted an indirect approach and influenced them through the Tier 1 or 2 suppliers. At the sustaining stage, IKEA mainly applied an indirect and work with third party (i.e., Better Cotton Initiative (BCI)) approach on these middle tier suppliers. For Tier 5 and 6 (extreme upstream) suppliers, IKEA adopted both direct and work with third party approaches simultaneously. Although all cotton farms supplying IKEA gained BCI's sustainable cotton farms certificate at the sustaining stage, as a commitment to BCI, IKEA continues to develop cotton farms who are willing to participate in sustainable cotton initiatives. Hence, it has continuously applied a direct approach on Tier 5 or Tier 6 suppliers.

Table 4 summarizes the case companies' governance mechanisms on their lower tier suppliers.

--- Insert Table 4 here ---

## **5.2 Supply chain leadership**

Based on the operationalised constructs presented in Appendix C, the leadership styles of three case companies are examined along the multi-tier supply chain and the three supply chain learning stages. The findings suggest that all the three companies applied a transformational leadership on Tier 1 and extreme upstream suppliers and generally applied a transactional leadership style on middle tier suppliers.

### **5.2.1 Transformational leadership on Tier 1 suppliers**

Tables in Appendix D list the supporting quotations which suggest that all three companies have applied both transformational leadership and transactional leadership styles on their Tier 1 suppliers. Table 5 makes a comparison of the three companies' leadership styles on their Tier 1 suppliers. All three companies inspired their suppliers to look further towards sustainability and transfer their sustainable goals to the suppliers (inspirational). All three companies made an attempt to change their Tier 1 suppliers' mind-set through stimulating them to contribute innovative ideas (intellectual stimulation). The three companies also provided financial/facility/expertise support to Tier 1 suppliers (individualized consideration).

Besides the transformational leadership style, which is the predominant form, all three

companies also exhibited the transactional leadership style. The three companies clarified the rewards to their Tier 1 suppliers in advance and provided assistance in exchange for their cooperation and they recognized and rewarded Tier 1 suppliers on their achievements (contingent reward). All three companies exhibited the ‘management-by-exception’ character, in that they monitored the suppliers’ progress and pointed out the mistakes made by their suppliers. However, transactional leadership style was used to facilitate transformational leadership and is not used as the main leadership style for Tier 1 suppliers.

### **5.2.2 Transformational leadership on extreme upstream suppliers**

Appendix E lists the supporting statements for Tetra Pak (consumers), Nestlé (DFI partners) and IKEA’s (cotton farmers) leadership styles on their extreme upstream suppliers. Table 6 makes a comparison of the three companies’ leadership styles on their extreme upstream suppliers.

All the three companies applied a transformational leadership style towards their extreme upstream suppliers. Tetra Pak launched a series of campaigns targeting the public (considered as extreme upstream suppliers) in order to educate the consumers for environmental protection and that UBCs can be recycled into useful raw materials for other products (inspiration). Nestlé collaborated with dairy industry partners who share the same vision for China’s dairy industry, relied on the partners’ strength and sought their contribution in helping the sustainable development of the dairy industry (intellectual stimulation). IKEA approached Tier 5 ginners and Tier 6 cotton farmers directly and with the support of BCI. IKEA exhibited a transformational leadership on the Tier 5 ginners by inspiring them to think long term development and sustainability and relied on these suppliers to influence the cotton farmers’ activities towards sustainability and provided help to cotton farmers based on their needs (individualised consideration).

Both Nestlé and IKEA also exhibited traces of evidence to apply a transactional leadership style on the extreme upstream suppliers but in a less significant way than the transformational leadership style. DFI partners obtained potential business opportunities by training Nestlé’s dairy farmers and this is beneficial for their reputation. IKEA recognized the cotton farmers’ achievements and listed the sustainable cotton farmers in their preferred supplier list (contingent reward). Later, IKEA encouraged cotton farmers to join BCI thus providing them more opportunities to supply other retailing brands, e.g., H&M. IKEA also pointed out the problems made by these suppliers so as to encourage their continuous improvement (management by exception).

--- Insert Tables 5 and 6 here ---

### 5.2.3 Transactional leadership on middle tier suppliers

Table 7 presents the case companies' leadership styles on their middle tier suppliers. As Nestlé do not have a middle tier supplier (suppliers between Tier 1 suppliers and extreme upstream suppliers), the table makes a comparison between Tetra Pak and IKEA and suggests that focal companies applied a transactional leadership style with middle tier suppliers. Tetra Pak collaborated with some collection companies and mainly applied contingent reward on the collection companies and individual collectors. Tetra Pak provided facility/equipment support to the collection companies in exchange for their efforts, provided training to individual collectors through the collection companies and provided recognition and reward to the collectors for their achievements. Tetra Pak's environmental team constantly checked with progress and pointed out the mistakes made by them.

IKEA also applied a transactional leadership style towards their middle tier suppliers. Some middle tier suppliers gained business opportunities because of purchasing from sustainable cotton sources while some others lost business because of the lack of sustainability capacity or lack of interest in participating the sustainable cotton initiative. IKEA also pointed out the middle tier suppliers' mistakes by checking their sustainable cotton channels and their compliance with IKEA's standards.

Interestingly, at the sustaining stages, both Tetra Pak and IKEA tended to rely on Tier 1 suppliers to indirectly influence these middle tier suppliers. Tetra Pak relied on recyclers to develop their own recycling network and IKEA delegated the responsibility of sustainable sourcing of cotton to Tier 1 suppliers. Tier 1 suppliers of all three case companies tended to adopt transactional leadership styles towards the middle tier suppliers.

--- Insert Table 7 here ---

### 5.3 Supply chain structure in multi-tier supply chains

Mena *et al.* (2013) argue that there are three types of triadic supply chain structure: open triad, transitional triad and closed triad. This research explores the evolving statuses of the three supply chain structures inspired by Mena *et al.* (2013) but the supply chains of this study contain more tiers than Mena's (3-tier). At the operating stage, a new type of supply chain structure emerged from the data of this research in addition to the three types proposed by Mena

*et al.* (2013) and we label it **closed plus triadic supply chain** structure. Mena *et al.* (2013) propose three types of supply chain structure and assume that Tier 2 suppliers already existed in the supply chain. This fourth one indicates a scenario where a focal company initiated the relationship with new lower tier suppliers, who did not have any transactions with the focal company before, and develops them into qualified suppliers and then introduces them to Tier 1 in order to close the loop. It is labelled closed plus because there was no existing relationship between Tier 1 and the lower tier suppliers introduced by focal companies previously and the focal companies need to make extra efforts to identify and develop the new lower tier suppliers before introducing them to existing tier 1 suppliers. Both Tetra Pak and Nestlé directly identified the Tier 2 suppliers as new suppliers, developed and introduced them to Tier 1 suppliers who did not have transactional relationship with the tier 2 supplier before. This new type of triadic supply chain structure is outlined in Figure 2.

--- Insert Figure 2 here ---

From set up stage to operating stage, Tetra Pak moved from an open (isolated) triad (Tetra Pak, Tier 1 and Tier 2) to a linked closed recycle chain. The relationship between Tetra Pak, recyclers and collection companies represents a closed plus triad, in which Tetra Pak was trying to identify the collection companies (new tier 2 suppliers) and introduce to recyclers (tier 1 suppliers). Nestlé also identified DFI partners (tier 2) and introduced them to dairy farmers (tier 1) to create a closed plus triad. IKEA moved from an open supply chain to a closed supply chain with tiers 3-6 supplier but it changed from open to a transitional triad with Tier 1 and 2 suppliers.

From the operating to the sustaining stage, Tetra Pak's recycling chain is still an overall closed recycling chain. However, the closed plus triad with recyclers and collection companies changed to a transitional triad. Nestlé's (only three tiers) closed plus triad changed to a closed triad, in which DFI partners (Tier 2 suppliers) gradually built a close relationship with Tier 1 dairy farmers. IKEA's supply chain is still an overall closed supply chain while the triadic structure (with Tier 1, 2 suppliers) changed from a transitional to an open triad.

The supply chain structure of the whole multi-tier supply chains tend to be closed overall at operating and sustaining stages for Tetra Pak and IKEA. Nestlé's dairy chain contains three tiers only, so the overall structure is the same as triadic structure.

#### 5.4 Supply chain learning

In this research, the three case companies generally followed a learning process of three stages:

- supply chain mapping and awareness building, which can be considered as set up stage;
- capacity building as operating stage; and
- capacity sustaining as sustaining stage (Bessant *et al.*, 2003).

Supply chain mapping is used to gain knowledge of the supply chain, scan the supply market and identify the potential partner database, which may or may not be in the existing supply chain, awareness building aims to inspire suppliers and supply chain partners to ‘buy-in’, engage and make commitment to the sustainable initiative and also includes activities on supplier/partner selection. Capacity building refers to all kinds of support (financial, facility and expertise), and encouragement by focal companies to multi-tier suppliers to create sustainability capacity. Finally, capacity sustaining emphasizes the mechanisms to achieve long-term effect.

All the three companies obtained positive learning outcomes (Table 8). Tetra Pak were the first in the industry to create a recycling chain in China and achieved a continuously growing recycling rate and reached a recycling rate of 28% in 2015. Nestlé has been upgrading its dairy farmers and created a learning platform of DFI (Dairy Farming Institution) together with other industry partners (Tier 2 suppliers) and academic partners to share the best practices to the whole dairy farming industry. IKEA China achieved 100% sourcing from sustainable cotton sources, which is one step ahead of other companies’ practices.

In this section, we discussed the multi-tier supply chain governance, supply chain leadership, multi-tier supply chain structure and supply chain learning respectively. Table 8 presents what different tiers of suppliers (Tier 1, middle tier and extreme upstream) had learned from the sustainable initiatives and summarises the results of other constructs of supplier governance mechanisms, supply chain leadership and supply chain structure.

--- Insert Table 8 here ---

## 6. Discussion

This section presents discussions based on the cross case analysis and compares findings with the literature reviews. In order to answer the research question (*What role does MNC’s supply chain leadership play in learning of sustainability in multi-tier supply chains?*) and based on the within and cross-case analyses, a framework is proposed in Figure 3, which makes a summary of all the constructs of supply chain leadership, multi-tier supply chain governance

mechanism, multi-tier supply chain structure and supply chain learning. Propositions are developed on the relationships between these constructs shown in Figure 3.

--- Insert Figure 3 here ---

Addition to finding evidence for the existence of supply chain leadership, we found supply chain leadership is a more appropriate construct than power in a multi-tier SSCM context as power cannot explain why the suppliers with no direct trading relations with the focal companies were motivated to implement sustainable initiative. Studies on power in the supply chains (Cooper *et al.*, 1997; Hall, 2000; Cox *et al.*, 2004) tend to discuss only the role of power relationship with suppliers who have direct trading relations with focal companies and power is used to threaten trading partners in favour of a focal company's own benefits. Transactional leadership (contingent award and management by exception) can be seen as mechanisms to exert power. However, power does not explain the voluntary behaviour of suppliers who implemented sustainable initiatives (Ahi and Searcy, 2013).

The dimensions of transformational and transaction leadership of focal companies capture vividly the nuanced mechanisms of how to implement sustainable initiatives and why suppliers were motivated. Sub-tier supplier with no trading relationship with focal companies are inspired by focal companies' vision towards sustainability, were stimulated intellectually to find sustainable solutions (Tetra Pak recyclers; DFI partners of Nestlé and cotton farmers of IKEA) and were given individualised consideration in the forms of financing, hand-on training and support from dedicated sustainability teams. The middle tier suppliers of the three focal companies were rewarded with more purchase if they implemented sustainable initiatives and were reminded of their mistakes made while implementing sustainable initiatives, i.e., being applied with a transactional leadership style.

In general, focal companies adopt a transformational leadership style on Tier 1 suppliers and extreme upstream suppliers and a transactional leadership style on the middle tier suppliers in implementing their proactive sustainable initiatives throughout the supply chain learning stages (Set up, operating and sustaining). Focal companies' governance mechanisms on Tier 1 and extreme upstream suppliers tend to remain the same, while on middle tier suppliers the mechanisms change over time. For example, governance mechanisms applied by Tetra Pak on the collection companies (middle tier) changed from direct to both direct and indirect and for collectors it changed from indirect to do not bother. The governance mechanisms applied by IKEA on middle tier suppliers changed from direct and indirect to indirect and work with third

party (Table 4).

### **6.1 The combined effects of supply chain leadership and governance mechanisms on supply chain structure**

In this section, we discuss the combined effects of supply chain leadership and governance mechanisms on supply chain structure.

#### ***Focal company and Tier 1 suppliers***

Focal companies applied a direct collaborative approach and transformational leadership on Tier 1 suppliers to make the change (sustainable initiative) happen (e.g., recyclers in Tetra Pak; dairy farmers in Nestlé), or relied on Tier 1 suppliers to pass on sustainability requirements to lower tier suppliers (e.g., IKEA case). There is a pattern that “direct” governance mechanism and transformational leadership are adopted together by all the three cases and remains the same during the whole supply chain learning stages. We therefore propose that:

***Proposition 1a:*** *Proactive focal companies tend to apply a transformational leadership style (inspiration, intellectual stimulation and individualised consideration) combined with ‘Direct’ governance mechanism on Tier 1 suppliers in implementing proactive sustainability initiatives in a multi-tier supply chain throughout the learning stages.*

#### ***Focal company and middle tier suppliers***

Focal companies tended to adopt a transactional leadership style together with selected governance mechanisms to implement sustainable initiatives at middle tier suppliers. No governance mechanism was found to apply to middle tier supplier at the set up stage. In order to build up the middle tier suppliers’ sustainability capacity, focal companies tended to apply various governance mechanisms of direct, indirect and work with third party governance mechanisms with middle tier suppliers at the operating stage. The triad structures were established and this is associated with more resources at the operating stage than at the set up stage. Focal companies tended to downgrade the governance mechanisms (from “direct to “indirect”; from “indirect” to “work with third party”) at the sustaining stage comparing to operation stage. Along with the changing governance mechanisms, focal companies’ triad structure tends to shift to a triadic structure requiring fewer resources at the sustaining stage.

For instance, Tetra Pak mainly relied on recyclers to set up their own recycling network at the sustaining stage (a closed plus triad shift to transitional triad), thus it needs fewer



management resources in the relationship. In the Nestlé case, the triad relationship changed from closed plus triad to closed triad because DFI partners shared Nestlé's responsibilities to modernize dairy farms. In the IKEA case, the triadic relationship change from transitional triad to open triad. IKEA tended to delegate sourcing of more sustainable cotton to Tier 1 suppliers. Our findings are aligned with Bessant *et al.* (2003) and Lambrechts *et al.* (2012), in which focal companies need to play a leadership role in the supply chain learning stages and the leadership role tend to be shared with other supply chain members in the sustaining stage. Thus this research proposes:

***Proposition 1b:*** *Proactive focal companies intend to achieve sustainability in a multi-tier supply chain by applying a transactional leadership style (contingent reward and management by exception) and at the same time using one or more mechanisms of the three approaches on the middle tier suppliers: “Direct”, “Indirect”, or “Work with third-party”; as a result, the triad structure is associated with a pattern, which requires more engagement and resources at the operating stage and less involvement and fewer management resources at the sustaining stage.*

#### ***Focal companies and extreme upstream suppliers***

Focal companies tended to apply a direct approach (governance mechanism) alone or direct and work with third party together constantly on extreme upstream suppliers while implementing sustainable initiatives (e.g., consumers in Tetra Pak, and cotton farmers in IKEA; DFI partners in Nestlé), they may also work with third parties to leverage a bigger influence on extreme upstream suppliers (e.g., IKEA's work with BCI on ginner and cotton farmers). The findings suggest that focal companies tend to adopt a transformational leadership style together with a direct approach of engagement with the extreme upstream suppliers, who did not have a direct trading relationship before, in order to implement the sustainability initiatives in a multi-tier supply chain. As a result, all the three focal company's supply chain structures were overall closed (closed structure for the whole multi-tier supply chain) at operations and sustaining stages.

***Proposition 1c:*** *Proactive focal companies tend to apply a transformational leadership combined with “direct” alone or “direct” together with “work with third party” approaches constantly throughout the learning stages to extreme upstream suppliers, to create an overall closed supply chain structure and help its multiple-tier supply chain to*

*learn the proactive sustainability initiatives.*

Based on above analysis, we observed that different supply chain leadership styles and governance mechanisms were applied in a combined manner by the focal companies to implement the sustainable initiatives. The combined effects tend to change both triad and overall supply chain structure.

***Proposition 1d:*** *the combined effects of supply chain leadership and governance mechanisms affects supply chain structure while focal companies implement sustainability initiatives in a multi-tier supply chain in a way that the overall supply chain structure tend to remain closed, whilst the triad supply chain structure tend to be associated with a pattern requiring more management resources at the operating stage and fewer management resources at the sustaining stage.*

## **6.2 The combined effects of supply chain leadership and governance mechanisms on supply chain learning**

Hult *et al.* (2000) find that transformational leadership has a positive effect on organizational learning within a firm's boundary. We extend this argument to supply chains and found that focal companies tend to adopt different supply chain leadership styles together with different governance mechanisms in facilitating the learning in their multi-tier supply chains. Lambert *et al.* (1998) claim that supply chain learning needs time, effort and discipline and it is necessary for the leader to assume a facilitator role; learning will not occur itself but needs careful design and facilitation.

Our findings support these and found that learning in the supply chain went through three stages of set up, operating and sustaining and it is key for the supply chain leaders (three focal companies) to use different leadership styles and applied different governance mechanisms over time to facilitate the learning of sustainable initiatives by multi-tier suppliers. Similar to Bessant *et al.* (2003), to be more effective, the leadership role may change over time from an 'up-front role' to a 'stand-back' role in which other members actively take part (Lambrechts *et al.*, 2012, p. 631). Gosling *et al.* (2016) conceptually propose that supply chain leadership styles of transformational and transactional leadership may have an effect on supply chain learning of sustainability. This study has empirically supported this proposition and enriches it with important details. Also, we found different tiers of suppliers learned different content of sustainable initiatives (Table 8). Therefore, we propose that:

**Proposition 2a.** *Suppliers in a multi-tier supply chain learn different content and the complexity of learning to different tier suppliers is different. The learning complexity for tier 1 and extreme upstream suppliers tend to be high and the learning requires acquiring technical knowledge while the complexity for mid-tier suppliers tends to be low and the learning requires the suppliers to comply with some sustainable requirements.*

**Proposition 2b.** *Proactive focal companies need to apply different leadership styles together with different governance mechanisms along the supply chain learning stages towards different tiers of suppliers to facilitate their multi-tier supply chains learn sustainability.*

### 6.3 Supply chain structure and supply chain learning

Biotto *et al.* (2012) conclude that the coordination of supply chain learning needs substantial effort and resource commitment. We found that focal companies created different supply chain structures to facilitate the learning of sustainability in their suppliers. In particular, the closed loop plus type identified in this study requires significant efforts from the focal companies to develop lower tier suppliers and then introduce them to tier 1 suppliers in order to implement sustainable initiatives. The overall and triad supply chain structures are changing along with the learning stages as shown in Table 8. Therefore we propose that:

**Propositions 3.** *Proactive focal companies tend to create different types of supply chain structure (involving different levels of resources inputs) to facilitate their multi-tier supply chain to learn sustainability.*

## 7. Conclusion

Our research significantly enriches the research stream of SSCM in multi-tier supply chains, and examines the phenomenon through three cases: Tetra Pak creating a recycling chain in China (five tiers), Nestlé modernizing China's dairy industry (three tiers) and IKEA's sustainable cotton initiative (seven tiers). Going beyond the traditional focus on implementing supplier's code of conduct, this research has examined three proactive multi-tier SSCM initiatives and explore the role of supply chain leadership and supplier governance mechanisms in the learning of sustainable initiatives by the multi-tier supply chains.

### 7.1 Theoretical contributions

In answering the research question set out at the beginning of this paper, we have made the following contributions to SCM theory.

First, supply chain leadership is a relatively new and emerging concept in supply chain management research. Through these multiple cases, this research found that the ‘supply chain leadership’ is a more appropriate and richer concept than power in explaining how to implement sustainable initiatives in a multi-tier supply chain. This study found that focal companies tend to apply a transformational leadership style on Tier 1 and extreme upstream suppliers, and transactional leadership towards middle tier suppliers. To the best of our knowledge, this study may be the first to apply supply chain leadership in sustainability in multi-tier supply chain and produce interesting insights. Our research answered the research calls on supply chain leadership by Harland *et al.* (2007) and Overstreet *et al.* (2013).

Second, this research extends existing research on governance mechanisms in multi-tier supply chain. We further develop Mena *et al.* 's (2013) from three tiers to include whole multi-tier supply chains to more than three tiers. The research found that focal companies tend to build direct links with the extreme upstream suppliers to create an overall closed supply chain structure. Focal companies also proactively identified and developed new tier 2 suppliers and introduced them to tier 1 suppliers to facilitate the learning of sustainability and create a closely plus triad. The closed plus triad type was identified by this study as an important enrichment of three types suggested by Mena *et al.* (2013) and show the need for proactivity by a focal company while implementing SSCM initiatives. Our research also extends Tachizawa and Wong (2014) by suggesting that focal companies tend to apply various and mixed governance mechanisms especially on middle tier suppliers. More importantly, our research adopts a dynamic process perspective to reflect the changes of multi-tier supplier governance and supply chain structures along the three supply chain learning stages.

Third, we found some interesting insights regarding the relationships between these constructs. The combined effects of supply chain leadership and governance mechanisms is found to be critical in facilitating the learning of sustainable initiatives in multi-tier supply chains and creating new supply chain and triad structures. More interestingly, we found the supply chain structure is created by focal companies to facilitate the learning of sustainability in multi-tier supply chains. In a sense, we identified hidden mechanisms explaining how focal companies assuming leadership facilitate the learning of sustainability and supply chain structure as an intermediary between combined effects of supply chain leadership and governance mechanisms and supply chain learning. This model (Figure 3) is highly testable with an alternative method, i.e., survey.

## 7.2 Practical contributions

In addition to the theoretical contributions, this research has significant relevance to practice. For focal companies intending to implement proactive sustainable initiatives in multi-tier supply chains, they should play a leading role and apply different leadership styles towards different tiers of suppliers in the implementation of sustainability initiatives.

The whole implementation process needs focal companies' careful design and management. Focal companies could follow the three stage of supply chain learning framework, in which they need to conduct 'supply chain mapping' to generate a thorough understanding of the supply chain network and identify potential partners and the criteria for selecting suppliers. Then focal companies should exhibit transformational leadership to inspire the identified suppliers, persuade suppliers to 'buy-in' the sustainability supply chain vision, and align with focal companies' to pursue long term goals.

Next, focal companies should build capacity, apply transformational leadership intellectually stimulating suppliers and giving individual consideration, provide tailored support to the suppliers and encourage them to be creative and innovative to contribute new ideas.

Finally, focal companies move on to the sustaining stage when they could gradually delegate their responsibilities to supply chain partners and/or external third party partners, and let these partners (normally Tier 1 suppliers) gradually take on ownership of SSCM initiatives. In this process, they need to be very proactive mobilising and orchestrating resources internally and externally.

For suppliers, given the fact that focal companies care more and more about SSCM, suppliers' sustainability capability will become an increasingly important supplier selection criteria. To survive in the fierce competition, suppliers should create and enhance their sustainability capacity and be innovative and participative so as to make themselves outstand from their peers.

## 7.3 Limitations

The research has following limitations: First, only one sustainability initiative of each of the focal companies has been studied in this project. We are aware that SSCM includes a whole set of practices and doing well in a single proactive sustainable initiative does not mean that a focal company can be considered truly sustainable. However, it is our intension to focus on the proactive ones, which move away from the research on low hanging fruit sustainable projects.

Second, methodologically this project employs a case study approach containing three cases. It is not the intention for the study to be exhaustive of all the types of sustainable initiatives; the generalisation of the findings is constrained by the context.

#### 7.4 Future research directions

This research also opens many areas for future research. First, power is an important factor in supply chain relationships, and the extent to which focal companies' power has influence on lower tier suppliers requires further study. Although supply chain leadership is considered a more appropriate concept in this context, future research may look deeper the dynamic relationship between power and leadership in different contexts.

Second, as we mentioned the limitation of case study method, future research could take an alternative approach such as a large sample survey to test the propositions developed in this study (Figure 3).

Third, during the fieldwork, we found different types of followers from the suppliers. Followership theories may be applied to study multi-tier SSCM implementation from the suppliers' perspectives. There are no leaders without the followers. Defee *et al.* (2009b; 2010) point out that supply chain followers may have a bigger impact on supply chain performance than supply chain leaders. Future research could explore such questions as what role suppliers play in implementing SSCM initiatives and what followership behaviours they exhibit in the implementation process.

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#### Appendixes

--- Insert Appendixes A, B, C, D E here ---

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## Tables and Figures

| Company   | Industry                      | Global coverage                       | No. of Employee | Sales Revenue     | Corporate Sustainability Strategy   | Proactive project                   |
|-----------|-------------------------------|---------------------------------------|-----------------|-------------------|---|-------------------------------------|
| Tetra Pak | food processing and packaging | >170 countries                        | 23,000          | Euro 11.9 billion | PROTECTS WHAT'S GOOD: protecting food, protecting people and protecting futures | Creating a recycling chain in China |
| Nestle    | food and beverage             | nearly all countries around the world | 335,000         | CHF 88.8 billion  | Creating Shared Value   | Modernize China's dairy industry    |
| IKEA      | home furnishing               | operated in 43 countries              | 155,000         | Euro 31.9 billion | People & Planet Positive  | sustainable cotton initiative       |

**Table 1 Basic information of the three case companies**  
(Data in 2015; 1 Euro= 1.12 US Dollar, 1 CHF = 1.02 US Dollar)

|                  | Total | Focal company | T1 | T2-T6 | NGO | Cotton Association |
|------------------|-------|---------------|----|-------|-----|--------------------|
| <b>IKEA</b>      | 22    | 7             | 4  | 9     | 1   | 1                  |
| <b>Nestlé</b>    | 13    | 11            | 1  | 1     |     |                    |
| <b>Tetra Pak</b> | 8     | 4             | 4  |       |     |                    |
| <b>Total</b>     | 43    | 22            | 9  | 10    | 1   | 1                  |

**Table 2 A summary of No. of interviews**

| Test               | Application in this study   |
|--------------------|---|
| Construct validity | Multiple sources of evidence including semi-structured interviews, secondary data;<br>A chain of evidence: multiple informants in focal companies, and multiple informants at suppliers/ nontraditional supply chain partners;<br>Review of findings by an uninvolved senior academic;<br>The senior managers of each focal company review the draft within case analysis with feedbacks. |
| Internal validity  | Structured data coding and analysis;<br>Development of propositions based on a chain of evidence.   |
| External validity  | Theoretical sampling approach;<br>Thick descriptive data;<br>Site visits to various suppliers (Tetra Pak: three recyclers; Nestlé: ten dairy farms; IKEA: two Tier 1 suppliers and seven lower tier suppliers);<br>Participate in focal companies' training sessions.   |
| Reliability        | Use case study protocol to guide field research and analysis;<br>Develop case study database including recordings, transcripts, field notes, sustainability reports, internal documents, academic case studies, news coverage;<br>Iterative discussion with an uninvolved senior academic.  |

**Table 3 Reliability and validity in case research**  
(Source: Yin, 2008)

|                                    |   |                            |                    |                              |                       |
|------------------------------------|---|----------------------------|--------------------|------------------------------|-----------------------|
|                                    | Lower tier suppliers                                |                            |                    |                              |                       |
| Tetra Pak                          | Collection company (Tier 2)                         | Collectors (Tier 3)        | Consumers (Tier 4) |                              |                       |
| Approaches on lower tier suppliers | Direct ---> Direct/Indirect                         | Indirect ---> Don't bother | Direct             |                              |                       |
| Nestlé                             | DFI partners  |                            |                    |                              |                       |
| Approaches on lower tier suppliers | Direct  |                            |                    |                              |                       |
| IKEA                               | Tier 2 Dyeing                                       | Tier 3 Weaving             | Tier 4 Spinner     | Tier 5 Ginner                | Tier 6 Cotton farming |
| Approaches on lower tier suppliers | Direct/Indirect ---> Indirect/Work with third party |                            |                    | Direct/Work with third party |                       |

**Table 4 Supplier governance mechanisms on lower tier suppliers**

(Suppliers beyond Tier 1 in the upstream; Tier 1 not included; ---> reflect the changes from operating stage to sustaining stage)

| Leadership styles           |                              | Tetra Pak – Tier 1 Recyclers   | Nestlé – Tier 1 Dairy farmers  | IKEA - Tier 1 stitching suppliers  |
|-----------------------------|------------------------------|--|--|--|
| Transformational leadership | Inspirational                | <ul style="list-style-type: none"> <li>- Inspire recyclers to set up the recycling business;</li> <li>- Being an ethic/moral leader for recyclers;</li> <li>- Encourage recyclers to look further instead of focusing on short term goals;</li> <li>- Joint agreement on recycling targets.</li> </ul>   | <ul style="list-style-type: none"> <li>- Share with the dairy farmers the trend for upgrading;</li> <li>- Could follow other exemplar dairy farmers to success.</li> </ul>   | <ul style="list-style-type: none"> <li>- Align sustainability mission with Tier 1 CEO, general managers;</li> <li>- Clear milestones and pathway to achieve sustainable cotton targets;</li> <li>- Being an ethic/moral leader for recyclers.</li> </ul>   |
|                             | Intellectual stimulation     | <ul style="list-style-type: none"> <li>- Take a holistic approach to create the recycle chain;</li> <li>- Enhance the value of the recycling chain by developing new technology;</li> <li>- Market force together with policy force for recycling;</li> <li>- Encourage recyclers think of new ways to collect, develop new technologies.</li> </ul> | <ul style="list-style-type: none"> <li>- Set up DFI to promote modern dairy farming knowledge;</li> <li>- Lead dairy farmers to pay visits to DFI during its construction and operation;</li> <li>- Lead dairy farmers to pay visits to other dairy farms;</li> <li>- Various modes to upgrade, for example 'cow hotels'.</li> </ul> | <ul style="list-style-type: none"> <li>- Introduce trading companies and foreign suppliers to Tier 1 suppliers;</li> <li>- Provide trainings and workshops to Tier 1 and Tier 2 suppliers;</li> <li>- Lead Tier 1 suppliers view the sustainable cotton farms/fields;</li> <li>- Tier 1 suppliers paid visits to foreign suppliers.</li> </ul> |
|                             | Individualized consideration | <ul style="list-style-type: none"> <li>- Provide tailored help to each recycler.</li> </ul>  | <ul style="list-style-type: none"> <li>- Dedicated resource to follow the progress of each direct dairy farmers;</li> <li>- Make action plans together with the dairy farmers;</li> <li>- Various supports according to each dairy farmer's needs.</li> </ul>  | <ul style="list-style-type: none"> <li>- Encourage vertical integrated Tier 1 suppliers move ahead of others.</li> </ul>   |
| Transactional leadership    | Contingent reward            | <ul style="list-style-type: none"> <li>- Facility investment, discounted factory waste to seek recyclers' efforts;</li> <li>- Recognition of recyclers' achievement;</li> <li>- Lower factory waste price, more project support once recyclers' meet targets.</li> </ul>   | <ul style="list-style-type: none"> <li>- Recognize the ones moving fast;</li> <li>- Recognize the ones with good quality;</li> <li>- Support with capital, land, electricity, feedings;</li> <li>- Differentiate purchasing price to encourage upgrading.</li> </ul>   | <ul style="list-style-type: none"> <li>- Align the target with supplier positioning;</li> <li>- Prioritize cotton related product development;</li> <li>- More orders if suppliers implement good and fast.</li> </ul>   |
|                             | Management-by-exception      | <ul style="list-style-type: none"> <li>- Third party audit</li> </ul>  | <ul style="list-style-type: none"> <li>- Strict dairy purchasing requirements.</li> </ul>  | <ul style="list-style-type: none"> <li>- Verify the sustainable cotton channels by the output declaration forms (ODF) or contracts.</li> </ul>   |

**Table 5 A comparison of the three companies' leadership styles on their Tier 1 suppliers**

| Leadership styles           |                              | Tetra Pak - Consumers  | Nestlé - DFI partners  | IKEA - Tiers 5 & 6 Suppliers  |
|-----------------------------|------------------------------|--|--|---|
| Transformational leadership | Inspirational                | - Tetra Pak inspire consumers that the UBCs are not waste but can be recycled and processed into marketable raw materials or products. | - Vision alignment for China's dairy industry's sustainable development;   | - Tetra Pak inspire consumers that the UBCs are not waste but can be recycled and processed into marketable raw materials or products.  |
|                             | Intellectual stimulation     | NA   | - Lead DFI partners to visit Nestlé's milk districts to generate new ideas;<br>- Think of new ways for future collaboration. | - Collaborate with third parties to implement the sustainable cotton practices;<br>- The Tier 5 ginner design various promotional materials to educate cotton farmers;<br>- The Tier 5 ginner think of ways of promoting sustainable cotton knowledge to cotton farmers, for example in local newspapers, TV stations, and align with government trainings. |
|                             | Individualized consideration | NA   | - Design of training material and courses according to each partners' strengths.   | NA  |
| Transactional leadership    | Contingent reward            | NA   | - Potential to approach Nestlé's dairy suppliers;<br>- Collaborate with a world leading brand to quickly gain reputation.    | - Recognize the cotton farmers' achievement.<br>- List the suppliers in IKEA's preferred sourcing list;<br>- Opportunity to join BCI platform to approach other big international buyers.   |
|                             | Management-by-exception      | NA   | NA   | - Point out the problems for continuous improvement.  |

**Table 6 A comparison of the three companies' leadership styles on their extreme upstream suppliers**

| Leadership styles        |                         | Tetra Pak - middle tier suppliers   | IKEA - middle tier suppliers   |
|--------------------------|-------------------------|---|--|
| Transactional leadership | Contingent reward       | <ul style="list-style-type: none"> <li>- Facility support to certain collection companies;</li> <li>- Provide training to collectors at early years;</li> <li>- Recognize the achievement of collectors.</li> </ul> | <ul style="list-style-type: none"> <li>- Gain business opportunity with sustainable cotton channels;</li> <li>- Lose business if cannot source sustainable cotton within a given time/ no interest in sustainable cotton;</li> <li>- Provide training to some Tier 2 suppliers.</li> </ul> |
|                          | Management by exception | NA  | <ul style="list-style-type: none"> <li>- Verify the sustainable cotton channels by ODF or contracts.</li> </ul>  |

**Table 7 Transactional leadership applied by Tetra Pak and IKEA on middle tier suppliers**

| Constructs                         |   | T1   | Middle tiers   | Extreme upstream  |
|------------------------------------|---|--|--|---|
| Supply chain leadership            |   | Transformational   | Transactional  | Transformational  |
| Supply chain governance mechanisms |   | Collaboration  | Direct/indirect/work with third party--> indirect/work with third party/don't bother                                   | direct and/or work with third party   |
| Supply chain structure             |   | Triadic supply chain structure of focal company, T1 and T2<br>Closed plus--> closed/transitional;<br>transitional-->open   |  | Overall structure<br>Open-->Overall closed  |
| Supply chain learning              | <b>Tetra Pak recycling chain learning outcome:</b> Tetra Pak were the first in the industry to create a recycling chain in China and achieve a continuously growing recycle rate and reached a recycling rate of 28% in 2015.   | Recyclers learned or developed recycling technologies and supply chain management, working with new suppliers (collection companies) and new customers (plastic and aluminum customers). | Collection company and collectors learned sorting and waste classification knowledge (UBCs can be collected and sold). | Consumers learned sorting and waste classification knowledge (UBCs can be recycled).                              |
|                                    | <b>Nestlé dairy supply chain learning outcome:</b> Nestle has been upgrading its dairy farmers and innovative in creating a learning platform of DFI (Dairy Farming Institution) together with other industry leaders (Tier 2 suppliers) and academic partners to share the best practices to the whole dairy farming industry. Dairy farmers upgrade from small to | Dairy farmers learned modern dairy farming knowledge and the way of working with supply chain (i.e., Nestlé and suppliers)   | NA   | DFI partners learned to adapt for China's market conditions and to collaborate with Nestlé and other DFI members. |



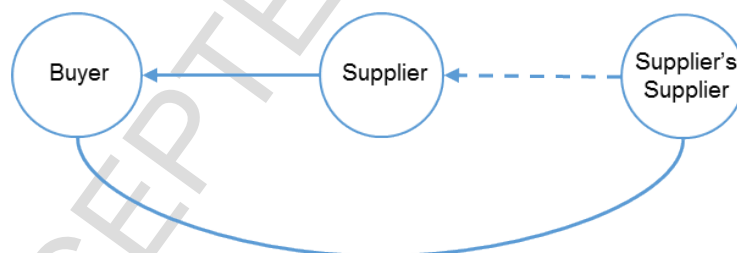
|  |  |   |   |  |
|--|--|---|---|--|
|  | medium or large size of dairy farms.   |   |   |  |
|  | <b>IKEA cotton-textile supply chain learning outcome:</b> IKEA China achieved 100% sourcing from more sustainable cotton sources in three years. The cotton farmers are practicing sustainable cotton standards in the fields. | Stitching companies learned the sustainable cotton project, supply chain leadership and the way of working with supply chain to implementing the project. | Middle tier suppliers earned to comply with IKEA's requirements on purchasing sustainable cotton sources. | Cotton farms learn to implement the standards with cotton farmers on the fields. |

**Table 8 A summary of all constructs**  
 (Note: --> represent the shift along the supply chain learning stages)

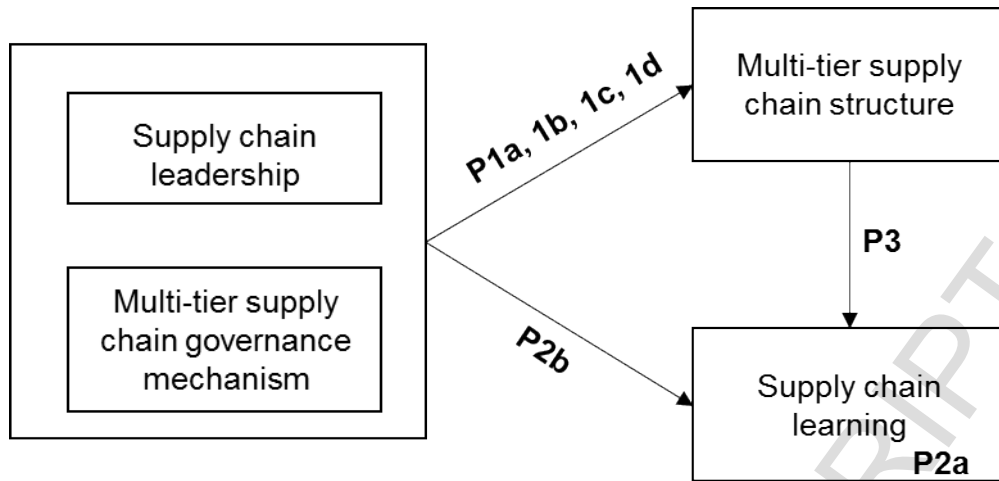


**Figure 1 Cities visited for data collection in China**

(1. Shuangcheng, Heilongjiang; 2. Beijing; 3. Binzhou, Shandong; 4. Zibo, Shandong; 5. Bengbu, Anhui; 6. Jiangyin, Jiangsu; 7. Shanghai; 8. Fuyang, Zhejiang; 9. Shaoxing, Zhejiang; 10. Songzi, Hubei; 11. Shenzhen, Guangdong)



**Figure 2 Closed plus triad supply chain structure**



**Figure 3** Proposed framework for supply chain leadership and supply chain learning in multi-tier SSCM

**Appendix A List of interviewees**

| No | Supply chain | Chain level   | Title  | Date     | Location                  |
|----|--------------|---------------|--|----------|---------------------------|
| 1  | TP           | Focal company | VP Corporate Communication                           | 20140922 | Shanghai                  |
| 2  | TP           | Focal company | Senior Environmental Engineer                        | 20141008 | Shanghai                  |
| 3  | TP           | Recycler      | General Manager                                      | 20141011 | Shanghai                  |
| 4  | TP           | Recycler      | General Manager                                      | 20141016 | Beijing                   |
| 5  | TP           | Focal company | VP Corporate Communication                           | 20150408 | Shanghai                  |
| 6  | TP           | Recycler      | General Manager                                      | 20150412 | Fuyang, Zhejiang          |
| 7  | TP           | Focal company | Cluster Environmental Director                       | 20150420 | Shanghai                  |
| 8  | TP           | Recycler      | General Manager                                      | 20160121 | Beijing                   |
| 9  | Nestlé       | Focal company | VP Corporate Affairs                                 | 20140926 | Beijing                   |
| 10 | Nestlé       | Focal company | Corporate Affairs                                    | 20140926 | Beijing                   |
| 11 | Nestlé       | Focal company | General Manager DFI                                  | 20141020 | Shuangcheng, Heilongjiang |
| 12 | Nestlé       | Focal company | Business Development Manager                         | 20141021 | Shuangcheng, Heilongjiang |
| 13 | Nestlé       | Focal company | Fresh milk procurement & agriculture service manager | 20150424 | Shuangcheng, Heilongjiang |
| 14 | Nestlé       | Focal company | Milk district TA supervisor                          | 20150424 | Shuangcheng, Heilongjiang |
| 15 | Nestlé       | Focal company | DFI business development manager                     | 20150424 | Shuangcheng, Heilongjiang |
| 16 | Nestlé       | Focal company | Milk district TA supervisor                          | 20150425 | Shuangcheng, Heilongjiang |
| 17 | Nestlé       | Tier 1        | Cow farm owners                                      | 20150425 | Shuangcheng, Heilongjiang |
| 18 | Nestlé       | Focal company | Milk district TA supervisor                          | 20150427 | Shuangcheng, Heilongjiang |
| 19 | Nestlé       | Tier 2        | Project Manager                                      | 20150427 | Shuangcheng, Heilongjiang |
| 20 | Nestlé       | Focal company | Fresh milk procurement & agriculture service manager | 20150428 | Shuangcheng, Heilongjiang |
| 21 | Nestlé       | Focal company | Milk district TA supervisor                          | 20150430 | Shuangcheng, Heilongjiang |

|    |      |               |   |          |                     |
|----|------|---------------|---|----------|---------------------|
| 22 | IKEA | Focal company | Sustainability Manager                        | 20141023 | Shenzhen, Guangdong |
| 23 | IKEA | Focal company | Business Development Manager                  | 20141106 | Shanghai            |
| 24 | IKEA | Focal company | Business Development Manager                  | 20141229 | Shanghai            |
| 25 | IKEA | Focal company | Deputy Sustainability Compliance Manager      | 20150409 | Shanghai            |
| 26 | IKEA | Focal company | Specialist Better Cotton Project              | 20150416 | Shanghai            |
| 27 | IKEA | BCI           | Membership Officer                            | 20150417 | Shanghai            |
| 28 | IKEA | Tier 5        | General Manager                               | 20150503 | Songzi, Hubei       |
| 29 | IKEA | Tier 1        | Purchasing Manager                            | 20150504 | Nanjing, Jiangsu    |
| 30 | IKEA | Tier 1        | Better cotton specialist & Purchasing Manager | 20150504 | Shanghai            |
| 31 | IKEA | Focal company | Specialist Better Cotton Project              | 20151123 | Shanghai            |
| 32 | IKEA | Focal company | Business Development Manager                  | 20151124 | Shanghai            |
| 33 | IKEA | Government    | Secretary                                     | 20151125 | Binzhou, Shandong   |
| 34 | IKEA | Tier 6        | Cooperative director                          | 20151126 | Binzhou, Shandong   |
| 35 | IKEA | Tier 3-4      | Deputy General Manager                        | 20151127 | Zibo, Shandong      |
| 36 | IKEA | Tier 1-5      | General Manager of Raw Material Branch        | 20151128 | Binzhou, Shandong   |
| 37 | IKEA | Tier 5-6      | Agriculture technic                           | 20151130 | Xinjiang            |
| 38 | IKEA | Tier 1        | Purchasing Manager                            | 20151130 | Jiangyin, Jiangsu   |
| 39 | IKEA | Tier 2-3      | Sales Manager                                 | 20151201 | Jiangyin, Jiangsu   |
| 40 | IKEA | Tier 2-3      | CEO   | 20151201 | Jiangyin, Jiangsu   |
| 41 | IKEA | Tier 4        | Sales Manager                                 | 20151202 | Bengbu, Anhui       |
| 42 | IKEA | Tier 2-3      | General Manager                               | 20151203 | Shaoxing, Zhejiang  |
| 43 | IKEA | Tier 4        | General Manager                               | 20151210 | Songzi, Hubei       |

(note: TP is short for Tetra Pak)

**Appendix B Interview protocol with focal companies**

How does your company understand SSCM? What is your company SSCM strategy?

Which SSCM projects do you implement? Why does your company take part in XX company's SSCM project (suppliers)?

What are the barriers when your company implements SSCM projects? How do you solve them?

How do Chinese customers and/or suppliers (Tier 1 & Tier 2 or even the whole upstream) learn in SSCM projects?

How does your company help them in the learning process?

Do you consider your company the leader in SSCM projects or creating SSCM in general in China? If yes, how do you understand SC leadership; Or how does leadership affect the creation of sustainable supply chain?

### Appendix C Coding on supply chain leadership

| Leadership styles                  | Leadership constructs          | Definitions  | Second order constructs                  |
|------------------------------------|--------------------------------|--|--|
| <b>Transformational leadership</b> | Inspirational                  | A mission and vision of a desirable future and the definition of the path to achieve the vision (Defee <i>et al.</i> , 2009a, p.39).         | goes beyond self-interest                |
|                                    |                                |  | emphasizes the collective mission        |
|                                    |                                |  | talks optimistically                     |
|                                    |                                |  | arouses awareness about important issues |
|                                    | Intellectual Stimulation       | Leaders calling on followers to be more innovative and creative to provide better solutions to problems (Defee <i>et al.</i> , 2009a, p.39). | re-examines assumptions                  |
|                                    |                                |  | seeks different views                    |
|                                    |                                |  | suggests new ways                        |
|                                    | Individualized Consideration   | A leader's ability to recognize each individual follower's unique skills and development needs (Defee <i>et al.</i> , 2009a, p.39).          | suggests different angles                |
|                                    |                                |  | individualizes attention                 |
|                                    |                                |  | focuses your strengths                   |
| <b>Transactional leadership</b>    | Contingent Reward              | Clarifying follower expectations and offering recognition and rewards when goals are achieved (Bass and Avolio, 1993).                       | teaches and coaches                      |
|                                    |                                |  | differentiates among suppliers           |
|                                    |                                |  | clarifies rewards                        |
|                                    |                                |  | assists based on effort                  |
|                                    | Management-by-Exception-Active | Leaders either closely monitoring followers problems or wait problem arise before take any corrective actions (Bass and Avolio, 1993).       | rewards your achievement                 |
|                                    |                                |  | recognizes your achievement              |
|                                    |                                |  | focuses on your mistakes                 |
|                                    |                                |  | puts out fires                           |
|                                    |                                |  | tracks your mistakes                     |
|                                    |                                |  | concentrates on failures                 |

### The constructs of supply chain leadership styles

(Sources: Avolio *et al.*, 1999; Defee *et al.*, 2009a, b, 2010; Overstreet *et al.*, 2013; second order constructs are selected from Multifactor Leadership Questionnaire (MLQ Form 5X) in Avolio *et al.*, 1999)

#### Appendix D Case companies' leadership on their Tier 1 supplier

**Table D-1** Tetra Pak's leadership on its recyclers

| Constructs         | Quotations  |
|--------------------|---|
| <b>Inspiration</b> | <p><i>"He talked with me the future of my company, the future of paper industry, what could be the future trends. Companies need to stand from a multi win or win-win point to think the question, if we the small companies could collaborate with the multinational company (Tetra Pak), it is like a small boat with aircraft carrier".</i></p> <p style="text-align: right;">--- General Manager of Recycler A</p>  |
|                    | <p><i>"Relatively speaking, we are not in the recycling business, we are standing far and high, we could help them to see the trend for this industry, we could tell them which direction they should go";</i></p>  |
|                    | <p><i>"Sometimes it is unavoidable, many recyclers are small companies, they may at many times content with their current situation. They may think I have a capacity of 20,000 tons, I have a profit rate of 10%-12% is good enough. Then I will tell them where is the industry growth area, what it will going to be look like, if you hold this opportunity, your business may double etc."</i></p> <p style="text-align: right;">--- Environmental Director of Tetra Pak Great China</p> |



|                                     |   |
|-------------------------------------|---|
| <b>Intellectual stimulation</b>     | <p><i>“I visited the collectors, but no one willing to do it. Well, we have to build up the recycle chain. Then I am thinking about, who drink the most of milk, children, so I contact with the local Youth League. I teach the kids to change their habit, to finish the milk at home, then squeeze the package and send back to school, then to us...”</i></p> <p><i>“Now I didn’t consider the small collection companies. I am looking for sanitation companies, and the incineration plant under sanitation companies. Because this is the trend, you cannot waste the energy to run it... the cartons must concentrated”.</i></p> <p style="text-align: right;">--- General Manager of Recycler A</p>  |
| <b>Individualized consideration</b> | <p><i>“According to the different conditions of each recycle partner, we provide specific trainings or hire the related experts to provide consulting projects to solve the corresponding issues. For instance, the recycle partner in Beijing, because the restrictions of the local environment policy, so its key point is on the upgrading of the current technology to cope with the regulation. We are looking for the related experts, to optimize production, not to develop new technologies but focus on its energy usage, water usage and etc. While on the other hand, Fulun is at a developing stage, it has needs in purchasing and utilizing new facilities, then we could let our supply management department to contact experts who have the experience of the new equipments at other countries to provide some help, another perspective it may need some advice on investment and financing, we could help accordingly.”</i></p> <p style="text-align: right;">--- Environmental Director of Tetra Pak Great China</p> |
| <b>Contingent reward</b>            | <p><i>“We only have requirement on the recycle volume, so I support you this equipment, I wish you could achieve a certain recycle volume in next few years... the continuous increase of recycled volume, actually also help us achieve our recycle target...”</i></p> <p style="text-align: right;">--- Environmental Engineer of Tetra Pak China</p> <p><i>“At that time their (Tetra Pak factory waste material) price was very cheap, the market price was 1,500 RMB per ton, while their price to me was 450 RMB per ton...why do they let me earn money? I was quite curious at the beginning, later I realise they wish I could earn the money and then recycle UBCs from the public”.</i></p>  |

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|                         | <p>--- General Manager of Recycler A</p> <p><i>“Now it has a new plant plan, the investment is very big with over 100 million RMB, why would it willing to do so? He is an entrepreneur with a further eye sight, he is considering the development in next ten years...we wish the recyclers can have a long term view.”</i></p>  |
| Management-by-exception | <p>--- Environmental Director of Tetra Pak Great China</p> <p><i>“Some of them didn’t meet the target, basically we do not have any strict punishments. Later we hope to make a rule, the equipment on your site for you to use, if you meet the target you can use it for free. If not, we may charge you...however, this is a possible method, and we have never tried.”</i></p> <p>--- Environmental Engineer of Tetra Pak China</p> <p><i>“(if not meet the target) Tetra Pak will reduce support, when you apply for projects at next year, it will reduce the support, including the factory waste material it considers your performance.”</i></p> <p>--- General Manager of Recycler B</p> |

**Table D-2 Nestlé's leadership on its dairy farmers**

| Constructs                      | Quotations   |
|---------------------------------|--|
| <b>Inspiration</b>              | <p><i>“Through the success story of some farms, we let other farmers know that it is not a dream to succeed and if one farm could achieve its goals, then why not the rest? If they have any questions, we help them and encourage them to develop”.</i></p> <p>--- Fresh Milk Procurement and Agriculture Service Manager of Shuangcheng Nestlé</p>   |
| <b>Intellectual stimulation</b> | <p><i>“One big challenge is the mindset. Actually land, capital, and skills are all problems, but they are not the most important. Their mindset is very difficult to change. Quite a lot of them have raised cows for more than 20 to 30 years. They believe that their model was satisfactory, however it is not the same now. They were fascinated by what they saw. This is exactly where DFI can play a very useful role, i.e., to show our farmers how a modern farm is managed with good results. It changed their mindset.”</i></p> <p>--- Technical Assistant Supervisor A of Shuangcheng Nestlé</p> <p><i>“After our discussion, we decided to respond to the Government’s call positively and do it in a way where Nestlé can add more value. We can also build farms, but can we do something others cannot do or have not done in order to truly play a role as the industry leader? Our proposal was to build the Nestlé Dairy Farming Institution (DFI). The DFI is open to the whole industry and can provide the much-needed training to address new changes in managing a modern farm, such as farm efficiency, environmental impact, etc.”</i></p> <p>--- Vice President of Corporate Affairs at Nestlé China</p> |

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| <p><b>Individualized consideration</b></p> | <p><i>“At the end of 2012 we had made a list of these dairy farmers and visited them door by door. We have a team to find out those interested in upgrading. They also explain to the farmers the benefits of a modern farm and they did a very good survey. They selected the key farmers and we arranged specific TA supervisors to follow them and encourage them.”</i></p> <p>--- Fresh Milk Procurement and Agriculture Service Manager of Shuangcheng Nestlé</p> <p><i>“Now each supervisor is in charge of a certain number of direct dairy farms. They organize a gathering almost every week or two weeks either around the farms or at one farm to discuss the trends and the situation of the farms.”</i></p> <p>--- Technical Assistant Supervisor B of Shuangcheng Nestlé</p>   |
| <p><b>Contingent reward</b></p>            | <p><i>“Because we have the details about how much money they need as well as whether they need a milking parlour or a cooling tank, we can help the bank to get a better estimate of the capital that is needed. We helped coordinate this issue and within just six months, the bank approved lending to around 60 farmers with more than 60 million RMB...the farmers do have confidence in development and do want to grow bigger”</i></p> <p><i>“We have also done a financial support demonstration project. We have a dairy farm locally with 100 cows. The owner wants to grow and we feel he has the potential. So we are thinking about how could we help it develop, then we invite the experts who are helping design DFI at that time....With a bank loan of five million RMB the farmer has grown from less than one ton fresh milk per day to more than three tons. The five million was spent in building a standard cowshed and buying cows”</i></p> <p><i>“It is not easy for farmers to get suitable land, so we communicate with the government whether they could give priority to dairy farmers... for electricity, the milking parlour needs to use three-phase electric and we coordinate with the government again on whether the electricity department could give a discount to the farmers”</i></p> <p><i>“The purpose of the grading scheme is to reward those farmers who invest in better farm management. ‘A’ types</i></p> |

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|                                | <p><i>of farms are paid much higher than the guidance price. There are slight differences between each grade, each grade is higher than its lower grade...we classified them into A, B, C, D to incentivize them. With a bigger scale, higher grade, you will pay more and have a higher profit rate...it has different levels and is progressive.”</i></p> <p><i>“All milk meets the quality standard. The reward scheme is to encourage continuous improvement. For example total mixed ration (TMR) has a big impact on the milk’s fat protein component. We consider this in our pricing table... to let them have motivation to raise cows better. Having more milk is one thing and higher protein is another perspective.... There is a higher price for a better performance. All our work is encouraged to let everyone focus on improvement. It is important for them to have the motivation.”</i></p> <p><i>“We still plan to invest five million RMB this year on facilities. Because the farmers lack of understanding on the new equipment, it takes time. So for instance, this year we plan to purchase the reclaim machine to get silage – a new tool that none of the farmers in Shuangcheng have used before...and also cow brush, which we have in DFI. We think how to introduce it to them to increase animal welfare. These could have a pull effect on them and let them feel someone is helping them. It is a leading effect.”</i></p> <p>--- Fresh Milk Procurement and Agriculture Service Manager of Shuangcheng Nestlé</p> |
| <b>Management-by-exception</b> | <p><i>“If it is adulteration, they must be fired immediately, we won’t collaborate again. The dairy farmers’ registration numbers are unique, they can’t registry again once been fired.”</i></p> <p>--- Fresh Milk Procurement and Agriculture Service Manager of Shuangcheng Nestlé</p>   |

**Table D-3 IKEA's leadership on its Tier 1 suppliers**

| Constructs           | Quotations   |
|----------------------|--|
| <b>Inspirational</b> | <p><i>“Because business development team is leading the development and business of the suppliers ... so for us the biggest task is how to align IKEA’s strategy and vision with the suppliers, that is what the most important.”</i></p> <p><i>“We approached at least the suppliers’ president or general manager level, and we could sit down and have a deep discussion on the topic, including what is the meaning of this strategy for IKEA and for the suppliers ... suppliers soon realize it is a win-win situation, because if IKEA wants to be a global sustainable cotton retailer and a leading brand, then if the suppliers achieve the agreement and together we work on it, in fact the supplier become a leading company in China or even globally. It is not just about little economic profit, but it brings more value to the company brand and core competitiveness.”</i></p> <p style="text-align: right;">--- Business Development Manager of IKEA Home Textile Products</p> <p><i>“We emphasis on communication at the first beginning and we did lots of detailed analysis with the suppliers with some trainings on what is the whole project, our target and the steps. We do it slowly as you can’t explain clearly by just once... We have also invited Tier 2 suppliers, because in the end its them to implement.”</i></p> <p style="text-align: right;">--- Sustainable Cotton Manager of IKEA China</p> <p><i>“Firstly we have cooperated with IKEA for more than ten years, secondly we have employees between 8,000 to 9,000, we need such project to support our business, so when IKEA told us about this project we think it is feasible, and as a Top 500 Shanghai private company we need to take the corresponding responsibility, so we eagerly take part.”</i></p> <p style="text-align: right;">--- Purchasing Manager of Tier 1 Supplier A</p> <p><i>“IKEA first introduced their target and told us about sustainable cotton, it should be that time they have set</i></p> |

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|                                     | <p><i>some key time node (milestone), to be what percentage at what time, when is the deadline for 100%."</i></p> <p>--- Purchasing Manager of Tier 1 Supplier B</p>  |
| <b>Intellectual stimulation</b>     | <p><i>We feel difficult at that time, because no one in China have done this, at the same time we are not familiar with cotton...not enough resources in China. IKEA then organized several events, they invited the suppliers in Indian and Pakistan, and introduced some big international cotton traders...through IKEA we get in touch with these companies."</i></p> <p><i>"In the end of 2013, together with our president, we went to Indian and wanted to have a look how IKEA worked in India. We have visited some suppliers recommended by IKEA and also visited some suppliers through our own network."</i></p> <p><i>"I think IKEA actually managed the two ends, one is like me as IKEA's direct supplier, they need me to push the sub suppliers, but I am too far away to the extreme upstream...they also act as BCI to managed the cotton field...so they managed the two ends, when the two ends link together, then the project is smooth."</i></p> <p>--- Purchasing Manager of Tier 1 Supplier B</p> |
| <b>Individualized consideration</b> | <p><i>The sustainable cotton manager is served as the dedicated source to answer each suppliers' queries.</i></p>   |
| <b>Contingent reward</b>            | <p><i>"From the business development perspective, we link all the aspects with what we call a supplier positioning, so we make sure that the sustainable development capacity it is not just a statement or it doesn't matter if you do not do it. We create a strong link with the suppliers' development and business, so the suppliers would realize better do it early than late unless they do not want the business, do not want to develop with IKEA."</i></p> <p><i>"We highlight it at the very beginning, to suppliers which have the sustainable cotton platform and channel and are doing their best, such that we could give priority for product development. If you left behind, you won't have the chance to develop new cotton related products ... we send a strong signal that sustainable development</i></p>   |

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|                                | <p><i>is our core focus.”</i></p> <p>--- Business Development Manager of IKEA Home Textile Products</p> <p><i>“We have cooperated with IKEA for a long time, so we actively respond to any calls or initiatives from IKEA. Because the better you do, the early you do, the fast you do, you could definitely gain more opportunities and grow. While we also know that IKEA is a world leading company in environment and social aspects, our CEO is also quite agree with the philosophies...So for us, we are definitely willing to take part no matter from a business development perspective or a social responsibility perspective.”</i></p> <p>--- Purchasing Manager of Tier 1 Supplier B</p> |
| <b>Management-by-exception</b> | <p><i>“IKEA provides training to us every year. They let us know the requirements and we then pass these requirements to our suppliers...we first make constraints in the contract and make it clear that IKEA’s fabric need to use IKEA recognized sustainable cotton.”</i></p> <p>--- Purchasing Manager of Tier 1 Supplier A</p>  |



## Appendix E Case companies' leadership on their extreme upstream suppliers

Table E-1 Nestlé's leadership on DFI partners

| Constructs                          | Quotations  |
|-------------------------------------|---|
| <b>Inspiration</b>                  | <i>"Here in DFI the management model is that of membership - you see in our office all the members are here. It is like an Operations Committee, all of us could participate - not only Nestlé makes the decision but all of us push for the development"</i> --- Business Development Manager at Nestlé DFI  |
| <b>Intellectual stimulation</b>     | <i>"Together we are designing training materials, writing standard operation guidelines...visiting key customers...we are also presenting in conferences together. We took them to each milk district to give lessons to the milk district."</i><br><i>"This project is like operating a smartphone. At the beginning we may not be good at many functions, but slowly we think what other functions can add to the mobile.... DFI is just like this, it is a new staff."</i><br>--- Business Development Manager at Nestlé DFI   |
| <b>Individualized consideration</b> | <i>"Nestlé hope to apply the advantages of different partners, and we will then apply our strengths to participate to design a training course according to our feature."</i> ---Technical Manager of Tier 2 Supplier A   |
| <b>Contingent reward</b>            | <i>"We have collaborated with the farmers for more than 20 years. The relationship is way over and above simple commercial relationships of buying and selling fresh milk. This is like a friendship between comrades and it is based on trust...many brands say I am one of DFI's partners, then it has a higher reputation."</i><br>--- Fresh Milk Procurement and Agriculture Service Manager of Shuangcheng Nestlé<br><br><i>"We hope to help the farmers in the transformation...Secondly it is a win-win situation ... our reputation enhanced quickly into another level. Compared with other companies in the industry, although they started early, we grow much faster."</i> --- Project Manager of Tier 2 Supplier B |

**Table E-2** IKEA's leadership on its Tier 5, Tier 6 suppliers

| Constructs                      | Quotations   |
|---------------------------------|--|
| <b>Inspirational</b>            | <p><i>"We could only say we promote the better cotton principles as the farmers have grown cotton for decades, they have more knowledge than us. They may just need to change their mindset on some principles like how to save water, use less fertilizer and pesticides, and how to apply more biological preventions."</i></p> <p>--- Deputy sustainable manager of IKEA China</p>  |
| <b>Intellectual stimulation</b> | <p><i>"To be honest, we think a lot on the training materials. With a few words we can quickly understand when we receive training. However we need to bear in mind when we provide training to the farmers, such as the videos and the cartoons we made, we need to make sure they are something that the farmers can easily understand just by seeing them."</i></p> <p>--- General Manager of a Tier 5 &amp; 6 supplier</p>   |
| <b>Contingent reward</b>        | <p><i>"Before it was normal farming, but after they told us about the principles, we shared them with the farmers. In the second year IKEA compared our performance to the first year's... their method are once you made progress they recognize you, so we are more active with our work ... I quite admire IKEA's approach, it won't happen overnight to truly change an idea and carry it out... To change people's mind, I think it is a gradual process... firstly they recognize our progress and secondly point out the problems, so in the second year I am quite clear what should I do in order to achieve my target. If it is not good in the first year and not good again in the second year, then we can only give up. Without cooperating with IKEA we could still sell cotton. Cooperation with IKEA just means I have another sales platform."</i></p> <p>--- General Manager of a Tier 5 &amp; 6 supplier</p> |
| <b>Management-by-exception</b>  | <p><i>"...At the same time they point out the problems, and you must make changes later..."</i></p> <p>--- General Manager of a Tier 5 &amp; 6 supplier</p>  |