



**LUND UNIVERSITY**

School of Economics and Management

Master's Programme in  
Innovation and Global Sustainable Development

**The role of local lead firms in the transformation  
of smallholders' technological capabilities  
for sustainable production:**

**A case study of Vietnam shrimp production**

by

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EKHS34  
Master's Thesis (15 credits ECTS)  
June 2019  
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Examiner: Bengt-Åke Lundvall  
Word Count: 15 979

# Abstract

The thesis aims to investigate the role of local lead firms in the transformation of smallholders' technological capabilities towards sustainable agriculture production through the lens of global value chain governance. The technological capabilities that help smallholders adopt and apply sustainable agriculture practices and comply with sustainability standards are related to production, investment and vertical linkages. Results from a qualitative study of two shrimp aquaculture value chains in Vietnam suggest that smallholders involving in shrimp production have improved their capacities and skills to apply and comply with the complex European sustainable shrimp standards, from which transformed their production towards sustainability, highlighting the important role of the local lead firms. In addition, the analysis of the two-shrimp aquaculture value chain cases in Vietnam also suggests that the differences in the degree of smallholders' transformation depends on the degree of the influencing role of the local lead firms, to a large extent. The study echoes findings of other studies on the learning mechanism at inter-firm level for developing countries to participate and upgrade global value chain governance. At the same time, the study supports a new learning model towards sustainability in which the local lead firms play an important role, and at the same time it reinforces the global value chain governance framework and contributes to filling in the gap in global value chain literature.

***Key words:*** local lead firms, smallholders, sustainability, sustainable production, global value chains, governance, technological capabilities.

# Acknowledgements

I would to thank all people who involved and contributed to making this study possible.

First and foremost, I would like to express my sincere gratitude to my supervisor, Professor Cristina Chaminade, who has always been patient to guide me through the research and careful in every detail of my writings. Without her, this study will never be finished.

Secondly, I would thank my friend, Dr Quang V. D. Evansluong, researcher of Sten K. Johnson Center for Entrepreneurship, Lund University School of Economics and Management, for helping and encouraging me through the research.

Thirdly, I would also thank Dr. Nhuong Tran, scientist and research lead for Vietnam of WorldFish<sup>1</sup>, for providing a peer review for my thesis with his rich experience in sustainable shrimp aquaculture of the world generally and of Vietnam particularly.

Further, I would also thank my former colleagues in EU-funded and SIDA-funded projects on promoting sustainable shrimp production and value chain development in Vietnam: Dinh Lap, Vu Thuy, The Dien of ICAFIS<sup>2</sup> and Quoc Tuan of Oxfam<sup>3</sup> in Vietnam who support me to arrange and prepare technical facilities for the skype interviews and provide me with relevant supporting documents to enrich data sources for my research as well.

Lastly, I must express my love to my daughters for bearing tough time with me and giving me love and continuous encouragement throughout my study. Thank you.

June 2019. Lund-Sweden

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<sup>1</sup> WorldFish is an international, non-profit research organization that harnesses the potential of fisheries and aquaculture to reduce hunger and poverty and a member of CGIAR, a global agriculture research partnership for a food secure future.

<sup>2</sup> ICAFIS (The International Collaborating Centre for Aquaculture and Fisheries Sustainability) is a non-profit organisation under VINAFIS (Vietnam Fisheries Society), with the mandate of promoting aquaculture and fisheries sustainability within Vietnam and sharing experiences from Vietnam internationally, primarily to developing countries in Asia-Pacific, Africa and Latin America.

<sup>3</sup> Oxfam is an international confederation of 20 NGOs (non-governmental organisations) working with partners in over 90 countries to end the injustices that cause poverty.

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# 1 Introduction

## 1.1 Research Problem

Global value chain (GVC)<sup>4</sup> governance has been applied as a conceptual framework to examine the linkages and relationships between firms, suppliers and consumers, in which the complexity of information, codification of transaction and competencies of local suppliers are the key factors to define the governance typology (Gereffi, Humphrey & Sturgeon, 2005). The role of the “lead firms” that refer to the international lead firms in the changes of the local suppliers’ competencies was introduced and discussed widely in previous studies; for example, in participation in the GVCs (Gereffi, 1994; Gereffi, Humphrey, Kaplinsky & Sturgeon, 2001), in upgrading GVC governance (Gereffi, Humphrey & Sturgeon, 2005); in improving technological capabilities at inter-firm learning in GVCs (Morrison, Pietrobelli & Rabellotti, 2008; Pietrobelli & Rabellotti, 2011), and in catching up in knowledge and technologies of the developing countries (Lee & Malerba, 2016). However, little is known about the role of the local firms in GVCs.

The wider globalisation, liberalised international trade and quality-based competition, especially in supplying agri-food products, have required the tightening of vertical coordination of the chains by the international lead firms and the high competencies of the local suppliers (Gereffi & Fernandez-Stark, 2011). The international lead firms who are located at the farthest downstream tend to focus on preferred activities in developed countries, while the small-scale producers (herein after called the smallholders) who are at the farthest at the upstream in the developing countries lack competencies and accessibility to sustainable production practices and international standards that are required from them. The international lead firms tend to handle the primary production at the supply-side to their tier-1 suppliers who are considered to be the “local lead firms”<sup>5</sup> and capable intermediaries in linking them with and transforming the technological capabilities of the smallholders who require the explicit guidance and supports for their application of the sustainable production practices and compliance to the required agri-food standards (Lee, Gereffi & Beauvais, 2012). However, the role of the “local lead firms” is little known or under-investigated. The purpose of this thesis is to examine how the local lead

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<sup>4</sup> GVC(s) stands for global value chain(s)

<sup>5</sup> The local lead firms, in this thesis, refer to the tier-1 suppliers in the developing countries

firms play their influencing role in transforming the smallholders' technological capabilities in the wider setting of transformations towards sustainable production.

International trade of fisheries and aquaculture products reached US\$143 billion in 2016 and continue to expand as projections up to 2026 (FAO, 2018). Aquaculture is expected to represent 57 percent of fish consumed worldwide and its production, mostly originated in Asia-Pacific countries, continues to be one of the fastest growing food sectors, in which farmed shrimp makes up some 80 percent. Vietnam is one of the top five shrimp exporting countries worldwide (FAO, 2018) with total shrimp export valued at US\$3.8 billion in 2017 that increased 22.3 percent in comparison with 2016 (VASEP<sup>6</sup>, 2017). In which, European markets is potential markets to make up 22.4 percent of total global shrimp exports and increase 43.7 percent in 2017 (VASEP, 2017). However, shrimp aquaculture in Vietnam faces many challenges towards sustainable development, due to: (1) high transaction cost including 12 percent of higher production inputs than other export countries (Indonesia, Thailand and India), (2) the increasing market-based food safety and certification standards, mandatory for European import markets such as ASC<sup>7</sup> while the application of those standards is too complex to the poor smallholders, who are making up of 80 percent of Vietnam shrimp producers, (3) the fragmented integration of smallholders into GVCs, (4) the limited presence of international buyers and (5) the poor market infrastructure dominated by the local lead firms (VIFEP<sup>8</sup> & Oxfam, 2016; Oxfam, 2018). These challenges limit the smallholders' opportunities to access and respond to the global market requirements of sustainable production and maintain their sustainable income (Yoshima, 2017; Tran, Bailey, Wilson & Phillips, 2013; Ha Tran, Bush & van Dijk, 2013).

Over the past years, despite substantial efforts made by shrimp farming actors to transform Vietnam shrimp production towards sustainability, its compliance with the sustainable standards including ASC standards is still very limited (VIFEP & Oxfam, 2016). In that sense, this thesis investigates the role of the Vietnamese shrimp processing companies<sup>9</sup> as the local lead firms in GVCs at the supply base, in which they structure and commit the value chain contracts that facilitate the application of the sustainable production practices and compliance with ASC standards. Their supporting activities and transactions in the local value chains might foster the evolution of the smallholders' technological capabilities towards

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<sup>6</sup> VASEP stands for Vietnam Association of Seafood Export and Processing.

<sup>7</sup> ASC stands for Aquaculture Stewardship Council, the aquaculture standards required by the European markets (see <https://www.asc-aqua.org/what-we-do/our-standards/farm-standards/the-shrimp-standard/>)

<sup>8</sup> VIFEP stands for Vietnam Institute of Fisheries Economics and Planning under the Vietnam Ministry of Agriculture and Rural Development

<sup>9</sup> The processing company(ies) refer to the tier-1 suppliers or the local lead firms



sustainability. While most of the existing literature deals with the role of the international lead firm in upgrading processes, there still exists a research gap in terms of the role of the local lead firms in the transformation of the smallholders' technological capabilities towards sustainability. Because of the prevalence of the practice and compliance with the global sustainable standards that ensure the sustained economic, social and environmental benefits of the smallholders in the developing countries, the subject requires greater academic attention.

## 1.2 Aim and Scope

The general objective of this thesis is to examine how the GVC governance affects the transformation of the local agricultural production towards sustainability. The thesis aims to specifically explore the influencing role of the local lead firms in the transformation of the smallholders' technological capabilities required for sustainable production. The key research question the study aims to address is:

*How do the local lead firms influence the transformation of the smallholders' technological capabilities?*

The thesis focuses on the role of the local lead firms to influence and transform the smallholders' capabilities in production, investment and linkage. It employs an inductive qualitative case study method, using two shrimp value chain cases in the Bac lieu province of Vietnam.

## 1.3 Outline of the Thesis

The rest of the study is organised as follow: Chapter 2 provides the theory of the study, which is composed of literature review and analytical frameworks, in which each includes four main fields, namely global value chain governance, technological capabilities, global value chain in agriculture and sustainable food and agriculture. Chapter 3 describes the methodology used for the research. Chapter 4 presents the findings of the study on the role of the local lead firms in transforming of technological capabilities of smallholders towards sustainability in local value chains. Chapter 5 presents discussions and introduces a model for a proposed theory, as well as practical implications and future research.

## 2 Theory

This chapter that comprises of (2.1) and (2.2) provides the theoretical foundation for examining the role of the local lead firms in the transformation of the smallholders' technological capabilities towards sustainability. First section (2.1) reviews the literature in GVC governance, technological capabilities in GVCs and sustainable agriculture value chain and how lead firms influence local suppliers' competencies. Through this section, the study reveals that there are still existed literature gaps on the influencing role of the local lead firms to the smallholders' technological capabilities towards sustainable agriculture production. Second section (2.2) presents conceptual frameworks of GVC governance, technological capabilities and principles of sustainable food and agriculture production. This section points out main methods to realise the aim of the thesis through the examination of the role of the local lead firms in the transformation of the smallholders' capabilities.

### 2.1 Literature Review

#### 2.1.1 Global value chain governance and the role of “lead firms”

Based on insights from production, transaction cost theories and technological capability and firm-level learning approaches, Gereffi, Humphrey & Sturgeon (2005) propose a typology of GVC governance. Governance in global value chains was defined by Gereffi and Korzeniewicz (1994) as “authority and power relationships that determine how financial, material and human resources are allocated and flow within a chain” (Hernández & Pedersen, 2017). The two following sections present the role of lead firms in GVCs in terms of production (2.1.1.1) and transactions (2.1.1.2), while technological capability is discussed in 2.1.2.

Gereffi, Humphrey & Sturgeon (2005) identified five generic ways that firms set up and govern linkages in value chains: (1) simple market linkages, governed by price; (2) modular linkages, where complex information regarding the transaction is codified and often digitized before being passed to highly competent suppliers, governed by standards; (3) relational linkages, where tacit information is exchanged between buyers and suppliers with unique or at least difficult-to-replicate capabilities, governed by trust and reputation; (4) captive linkages, where less competent suppliers are provided with detailed instructions by very dominant

buyers, governed by buyer power; and (5) linkages within the same firm, governed by management hierarchy (Figure 1).

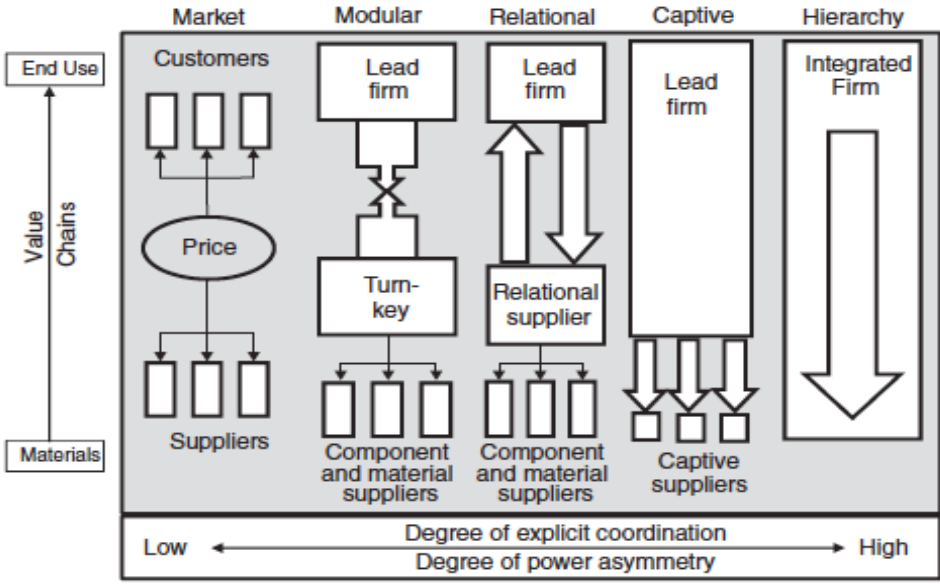


Figure 1: Global value chain governance modes (Gereffi, Humphrey & Sturgeon, 2005, p. 89)

2.1.1.1. The role of lead firms in production

First, the role of the international lead firms has been widely discussed in GVCs (Humphrey & Schmitz, 2002; Kaplinsky, 2004, 2010; van Dijk & Trienekens ed., 2012; De Marchi, Gereffi & Grandinetti, 2018) and in GVC governance (Gereffi, Humphrey & Sturgeon, 2005); Ponte, Kelling, Jespersen & Kruijssen, 2014; Kano, 2018). The international lead firms, as argued by Gereffi (2001), are the multinational enterprises or international companies located in developed countries who specify the products and define the diverse relationships along the chains. Many studies highlighted the role of the international lead firms in codifying information flow in GVCs (Gereffi, Humphrey & Sturgeon, 2005), governing product specification, codifying and transferring production process to suppliers who have high competence and are responsible for certain stages of production in modular governance (Sturgeon, 2002). In relational governance type, previous studies (Poppo & Zenger, 2002; Altenburg, 2006) found that the international lead firms also share complex and uneasily transferred knowledge.

Second, the role of the international lead firms was discussed in structuring GVC governance and upgrading of GVCs. Some authors discussed the international lead firms’ capabilities and skills possessed to share information and develop responsive actions on

generated knowledge for local suppliers (Hernández & Pedersen, 2017) and to stimulate cross-activity coordination (Mudambi, 2008). They implied the international lead firms are capable to do these activities while they are functioning through close engagement and well-functioning of their local capable firms, especially in some emerging economies. In addition, as Hernández & Pedersen (2017) argued, the international lead firms may structure different governance typologies depending on their capabilities in certain activities that they are capable to control. In this sense, international lead firms tend to choose to do what could be well-managed within their strong competence or territories, regularly at buyer base, and provide remote controlling of certain specialised activities to the supply base. This leads to attention that the international lead firms require to engage their tier-1 suppliers in undertaking a greater range of functional activities, shaping the geography and organisational restructuring of GVCs (Azmeah & Nadvi, 2014; De Marchi, Gereffi & Grandinetti, 2018). Little is known about the role of these tier-1 suppliers in stimulating the chains' coordination that could foster the transformation of local production, especially in agricultural or food production, one of the riskiest business following the traditional production techniques in developing countries and unpredictable climate situations.

Third, the governance structure varies over time as the production matures and capabilities of local firms evolve (Gereffi & Lee, 2012). Some studies discussed the evolution of local firms, especially SMEs<sup>10</sup> in developing countries from being assemblers to value partners through international acquisitions of companies with globally established brands (Prashantham & Yip, 2018); the appearance of new specialised suppliers, comparative advantages of countries, standardised activities and evolved technologies (Hernández & Pedersen, 2017). All those evolutions and changes diminish the role of the international lead firms at the supply base and at the same time promote the role of local intermediaries in GVCs through the international lead firms' codification of the knowledge and information in the chains. The important role of the local intermediaries on smallholders in compliance with the international agri-food standards and certifications, was also discussed in order to address the challenges of the smallholders in accessing and enhancing the sustainable production knowledge and practice the standards (Lee, Gereffi & Beauvais, 2012).

Fourth, the role of the international lead firms in transferring knowledge and learning production skills to local suppliers was indirectly discussed in relation to the catch-up in knowledge and technologies of developing countries. The studies discussed the changes of

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<sup>10</sup> SME(s) stands for small and medium enterprise(s)

latecomer countries from learning foreign knowledge and production skills to seeking separation and independence from foreign-dominated GVCs (Lee K., Szapiro & Mao, 2017) and closing the gaps in global market shares with firms in lead countries (Lee K. & Malerba, 2016). The studies also recognised the role of local firms, as “leaders in a sector”, in catching up foreign knowledge and technology in local value chains for increased participation into and upgrading GVCs through their replication and adaptation from the international lead firms’ practices.

The existing studies mentioned generally the role of local firms in codifying the production knowledge in local value chains and catch-up in knowledge with the international lead firms; however, the role of the local lead firms is not particularly recognised and their positive effects in production repositioning for local suppliers and transforming smallholders’ production capabilities towards the compliance of international standards are still under-researched.

#### 2.1.1.2. The role of lead firms in transactions

Firstly, the role of the international lead firms was discussed in linking firms in a variety of sourcing and contracting arrangement when mentioning the “system of governance” of multinational enterprises (Gereffi et al., 2001); in defining diverse relationships and transactions between firms in a range of governance options of the chains (Gereffi, Humphrey & Sturgeon, 2005). Many authors argued on the role of the international lead firms in coordinating the collaboration mechanism of the independent firm network in a context of trust and power within a volatile environment (Hernández & Pedersen, 2017 cited Buckley, 2016) and codifying the price mechanism to reach a deal (Gereffi & Fernandez-Stark, 2011). Hernández and Pedersen (2017) also implied the role of the international lead firms in vertical integration and managerial control, especially when production technology is complex to transfer and codify.

Secondly, the important role of the international lead firms who create and penetrate markets was analysed through different relationships of firms in various governance structure. The international lead firms, in relational governance of GVCs, use norms of reciprocity to respond quickly to changing conditions and resolve conflicts with their suppliers (Sturgeon, 2002). Altenburg (2006) argued on the role of international lead firms in captive governance, in which they provide more support and high monitoring but less bargaining power on selling

price to suppliers who have lower competencies than the international lead firms' requirements, especially in satisfying market demands. The role of the international lead firms was demonstrated in coordinating the deal of the little cooperation between buyers and suppliers in the market governance of GVCs (Gereffi & Fernandez-Stark, 2011). In the hierarchical governance, the international lead firms codify and bear all transaction cost (Hernández & Pedersen, 2017). They were forced to develop and manufacture in-house products which is driven by the necessity of exchange tacit knowledge and control resources over subordinates (Gereffi & Fernandez-Stark, 2011). Under current globalization and international trade, the international lead firms tend to manage the preferred activities within their competence or territories and for the reduction of transaction cost and deliver the certain activities to the local suppliers in remote developing countries. In that sense, the international lead firms may require intermediaries that could be their tier-1 suppliers, to represent them in dealing with the increasing changes through shared social norms of the locals at the supply base and shared transaction costs. Some studies discussed the influencing role of the international lead firms in the relationships with local suppliers for social and economic upgrading of GVCs in rising power economies such as greater China and South Asia (Lee & Gereffi 2014), in the pressure of CSR (corporate social responsibility)-embedded principles (Gereffi & Lee, 2012); in the control of the functions and tasks of the tier-1 suppliers in GVCs (Ponte & Gibbon, 2005; Sturgeon & Kawakami, 2010; Frederick & Lee K., 2017). Other authors discussed the upgrading trajectories of agricultural production through analysis of GVC governance in aquaculture value chains in Asian countries (Ponte et al. 2014) and canned tuna value chains with inter-firm strategies (Havice & Campling, 2017). However, the role of the local lead firms in governing transactions in GVCs is under researched.

Thirdly, the role of the international lead firms demanding the compliance to the international standards by local suppliers and smallholders in agriculture value chains regardless of the local competences was discussed by several authors (Tran et al., 2013; Jaffee, 2003; Kaplinsky, 2010; Ponte et al. 2014; Gereffi & Lee, 2014). Tran et al. (2013) argued that the effects of the agri-food market standards codified by the international lead firms pose a challenge to the smallholders who lack competencies, in which they claimed the limited presence of the international lead firms in fostering and supporting the smallholders in the compliance. Furthermore, they highlighted that while the local suppliers and smallholders acknowledge the importance of international standards, they do not know how to acquire the capabilities needed to respond to those standards (Jaffee, 2003; Humphrey & Memedovic,

2006, Kaplinsky, 2010; Ponte et al. 2014; Gereffi & Lee, 2014). The role of the local lead firms in facilitating the local response to these challenges of sustainable standards compliance are still under-researched.

Many authors suggested that upgrading of technological capabilities is important for developing countries to change the governance mechanisms, GVC participation and upgrading (Humphrey & Schmitz, 2002; Lema, Quadros & Schmitz, 2015; Gereffi & Lee, 2012; Ponte et al., 2014; De Marchi, Gereffi & Grandinetti, 2018). The degree of technological capabilities of local suppliers is one of three variables determining GVC governance and the upgrading of GVCs is affected by the evolution of their capabilities (Gereffi, Humphrey & Sturgeon, 2005). The study highlighted the role of the international lead firms in evolution of technological capabilities and firm-level learning mechanism which is presented in the following section.

### 2.1.2 Technological capabilities in GVCs and the role of “lead firms”

Technological capabilities might be driving participation in GVCs and fostering innovation for developing countries, from which they can fill the knowledge gaps, release the market failures and catch up with developed countries for global sustainable development. Research suggested that GVC is an effective form for access to global knowledge (Gereffi, Humphrey & Sturgeon, 2005), firm and inter-firm learning mechanism (Brancati E, Brancati F & Maresca, 2015; De Marchi, Giuliani & Rabellotti, 2015), learning opportunities for local firms facilitated by international lead firms (Morrison, Pietrobelli & Rabellotti, 2008; Pietrobelli & Rabellotti, 2011).

First, the role of the international lead firms was described as key in product development, branding, supplier selection and distribution, especially in agricultural production (Morrison, Pietrobelli & Rabellotti, 2008; Humphrey, 2004; Humphrey & Memedovic, 2006). However, the studies claimed the unclear role of the international lead firms in transferring knowledge along the chains, fostering, supporting local firms for production among producers in developing countries (Morrison, Pietrobelli & Rabellotti, 2008; Humphrey, 2004; Humphrey & Memedovic, 2006). They argued that transferring knowledge by the international lead firms depends substantially on the capacity, skills and volumes of local suppliers who become tier-1 suppliers. They also described the opportunity that agricultural and agro-based value chains are moving higher processing closer to farming sites that mostly are in developing countries and discussed the role of tier-1 suppliers as key agents for knowledge transfer outsourced by the

international lead firms. However, the influencing role of the local lead firms in fostering and supporting the local suppliers in upgrading production towards sustainability is under-researched.

Second, the role of the international lead firms in the changes in technological capabilities of the local suppliers was researched widely through engaging local suppliers in more knowledge intensive activities, innovation of value-added products (Giuliani, Pietrobelli & Rabellotti, 2005; Humphrey & Schmitz, 2002; Kaplinsky & Readman, 2001), and stimulating cross-activity coordination, as well as learning and innovation in the value chains (Mudambi, 2008). Some authors discussed the role of the international lead firms in increasing value-added share, introducing new technologies, improving technological capability that foster higher value-added production via skills and know-how, capital and technology and process for GVC upgrading (Marcato & Baltar, 2017). Other authors demonstrated the evolution and progress of local firms affected by GVC governance that generate substantial backwards linkages to the domestic economy (Gereffi, Humphrey & Sturgeon, 2005) and leverage competencies across chains (Pietrobelli & Rabellotti, 2011, cited Schmitz, 2006). Some authors suggested to explore GVC initiatives in strengthening the weakest value chain links by improving the capabilities of local small suppliers that are potentially relevant to enhance local innovation opportunities (De Marchi, Giuliani & Rabellotti, 2015, cited Humphrey & Aleman, 2010). Other authors suggested the role of local intermediaries to the smallholders in agro-food value chains (Lee et al., 2012); how local firms catch-up in knowledge and technology in emerging industries (Lee K., Szapiro & Mao, 2017; Lee K. & Malerba, 2016); the functions and tasks of the tier-1 suppliers in GVCs (Ponte & Gibbon, 2005; Sturgeon & Kawakami, 2010; Frederick & Lee K., 2017). However, little is known about the mediating role of the local lead firms in the transformation of the local suppliers' capabilities, especially the smallholders in agricultural value chains towards sustainability.

Third, the role of the international lead firms was described in the diverse learning mechanisms in various form of GVC governance for suppliers in developing countries. Some authors focused on the pressure to achieve international standards or direct involvement of the international lead firms and based on the suppliers' competence (Pietrobelli & Rabellotti, 2011). They illustrated the learning efforts by local firms in the modular governance structure, in which the international lead firms played little part in assisting local suppliers. They also argued about the complexity of tacit information and knowledge which local suppliers must be able to maintain and strengthen their production and capabilities to interact with the



international lead firms in a relational structure, from which they related to the learning by local suppliers in upgrading their capabilities. Other authors described that GVC-related knowledge is only a source of knowledge that complements to some other channels such as collective learning at the local level that needs a certain degree of innovative knowledge variety, following to the local context and tacit knowledge as well as inter-firms learning and innovation heterogeneity at cluster and national level (De Marchi, Giuliani & Rabellotti, 2015). The study argued that the role of the international lead firms in developed countries and GVC-related knowledge have received much more attention by many authors, however, research in inter-firms learning at the Southern-end of GVCs is missing and suggested future research on “South-South GVCs” (De Marchi, Giuliani & Rabellotti, 2015).

Above discussion suggests that the role of the international lead firms in GVCs in the codification of the production, transaction cost and transformation of technological capabilities of the local suppliers is studied at a deeper level and is influenced by the GVC governance, while the role of the local lead firms in GVCs is reviewed at superficial level. However, local producers on tier 2 or 3 seldom interact with the international lead firm and depend much more on the local lead firm for their production.

The thesis aims to explore how the smallholders improve their capabilities through inter-suppliers learning within local value chains, from which examine the role of the local lead firms, who are the most capable in the local value chains, fully participate in GVCs and actively interactive with the international lead firms, aligning with the research’s suggestion (De Marchi, Giuliani & Rabellotti, 2015; Lee, Gereffi & Beauvais, 2012).

While developed countries are competing in many parts of value chains, including in resource-intensive sectors such as agriculture, mining and food processing (FAO, 2016), developing countries find their opportunity for export growth of agricultural products to global markets as the central to poverty reduction. Moreover, under the context that “food security is also affected by the global trend towards standardisation and increasing monoculture, which is reducing biodiversity and increasing systemic risk” (OECD, 2013), increased productivity and a more sustainable food system will be necessary to improve global food security. To do so, the international lead firms are currently requiring and monitoring sustainable production while the local suppliers are required to practise the standards in a well-structured agricultural GVCs to meet global agribusiness systems (Humphrey & Memedovic, 2006). The local lead firms play a role as the key local innovation brokers for the transformation of local sustainable production (Devaux, Torero, Donovan & Horton, 2017) that will be discussed in the following section.

### 2.1.3 Global value chains in sustainable agriculture and the role of “lead firms”

Sustainability in agricultural systems is viewed in international fora as essential for the transition to global sustainable development. FAO (1991) defined sustainable agriculture as primary agriculture that conserves land, water, plant and animal genetic resources, environmentally non-degrading, technically appropriate, economically viable and socially acceptable”. FAO (2014) defined a vision for sustainable food and agriculture by a conceptual model of 5 key principles to ensure the transition towards sustainability (Appendix 1).

Firstly, the literature in agri-food GVCs discussed the organisations of agricultural value chains with “increasing levels of vertical coordination, upgrading of the supply base and increased dominance of large multinational food companies” (McCullough, Pingali & Stamoulis, 2008; Swinnen & Maertens, 2007, OECD, 2015a). Studies explored potential benefits that GVCs can bring to developing countries such as employment, productivity, income per workers, smallholders and labour skill mix (Yoo, Gopinath & Kim, 2012; Gonzalez, 2016; OECD, 2015a). Other studies described the smallholders’ participation in high-standards GVCs and how much local suppliers effectively benefit from this participation. In which, the gains from high-standards agricultural GVCs are believed being captured by foreign investors and large food companies (Dolan & Humphrey, 2000; Reardon, Codron, Busch, Bingen & Harris, 1999) and decision-making authority is displaced to the downstream companies due to coordination mechanism and consolidation at the buyer end (Warning & Key, 2002).

Secondly, the literature is increasingly focusing on how firms improve their environmental performance and promote green strategies to transform environmental constraints into new drivers of competitive advantage (De Marchi, Di Maria & Micelli, 2012); environmental implications of agro-food value-chain dynamics (Bolwig, Ponte, du Toit, Riisgaard & Halberg, 2010); environmental labels and certifications (Klooster, 2005; Ponte, 2008) or on fair trade (Taylor, Murray & Reynolds, 2005; Reynolds & Wilkinson, 2007). The review of agricultural innovation and inclusive value-chain development (Devaux et al., 2017) suggested that literature should focus on the double challenge of responding to evolving demands of large enterprises and consumers as well as supporting the local suppliers in upgrading capacity to deliver quality products and sufficient volumes. This implied the important role of the tier-1 firms as a key intermediary in GVCs.

Thirdly, the increasing demands from the international lead firms towards sustainability and compliance to international standards are challenging the transformation of sustainable

production of GVCs' supply base. Studies discussed the importance of standards as market access and technological capabilities evolution as well as the way of upgrading GVCs (Jaffee, 2003; Humphrey & Memedovic, 2006, Kaplinsky, 2010), upgrading trajectories of selected aquaculture value chains towards "blue revolution" in Asia (Ponte et al. 2014), CSR embedded upgrading form (Gereffi & Lee, 2014). Meanwhile, the role of the international lead firms in the compliance to international sustainable agriculture standards is also discussed. The studies focus on the role of the international lead firms in supporting local suppliers to find necessary resources for meeting challenges of global food safety standards (Yoshida, 2017) and enhancing the standards and transformation of the agri-food system in developed countries (Lee, Gereffi & Beauvais, 2012); negative impacts and unintended consequence of compliance with the market-based standards and certifications by the smallholders in shrimp industry in Vietnam without or with limited presence of the international lead firms (Tran et al., 2013). These studies raised the concerns on opportunities and challenges of smallholders in developing countries to response to agri-food standards that are related to (i) the complexity of requirements and compliance cost that are too high to the smallholders' competencies (Yoshida, 2017; Tran et. al, 2013); (ii) the smallholders' inaccessibility to agri-food standards and (iii) the smallholders' organisation and management skills (Ha Tran et al.,2013). From which, the studies argued on the role of the local lead firms to facilitate institutions and manage the chains (Yoshida, 2013); the role of the local intermediaries who "often decide how [local] suppliers will meet supermarket demands" in tightening the "vertical and close coordination along the [local] chains" (Lee, Gereffi & Beauvais, 2012), in the context that the international lead firms are consolidating small groups of capable suppliers for their stringent and costly requirements at the supply base.

The above literature in GVC governance in agriculture production suggested that local suppliers play a more leading role in fostering learning and transformation of other local suppliers, especially the smallholders when the international lead firms of agro-based value chains move their higher processing subsidiaries closer to farming sites in developing countries. The role of the international lead firms in fostering knowledge and monitoring sustainable food and agriculture production practices has been investigated while little is known about the role of the local lead firms in transforming the smallholders' technological capabilities towards complying sustainability standards required by the international lead firms.

The following section discusses analytical frameworks and approaches applied by the thesis to fill the literature gap of the role of the local lead firms in transforming the smallholders' technological capabilities in agricultural GVCs towards sustainability.

## 2.2 Analytical framework

The GVC governance framework (Gereffi, Humphrey & Sturgeon, 2005), and the firm-level technological capabilities approach (Lall, 1992; Morrison, Pietrobelli & Rabellotti, 2008) are adopted as the key theoretical lens in this thesis. The conceptual model of sustainable food and agriculture is also adopted (FAO, 2014). Evidence from the literature indicates that technological capabilities of the smallholders to participate in GVCs relate to and are needed for efficient production management in local value chains. The role of the local lead firms in codifying the required knowledge and transaction fosters the improvements of the smallholders' technological capabilities, activities and innovation, from which it influences the local transformation for agriculture growth. The smallholders' technological capabilities could be single out of "production", "investment" and "vertical linkage" capabilities, considering the functions they perform and degree of complexity (Lall, 1992).

In this thesis, I investigated the role of the local lead firms in transforming technological capabilities of shrimp smallholders in Vietnam towards sustainable agriculture through the case studies of two shrimp global value chains in the Mekong Delta of Vietnam. The shrimp value chain analytical framework applied in this thesis is illustrated in Figure 2 below.

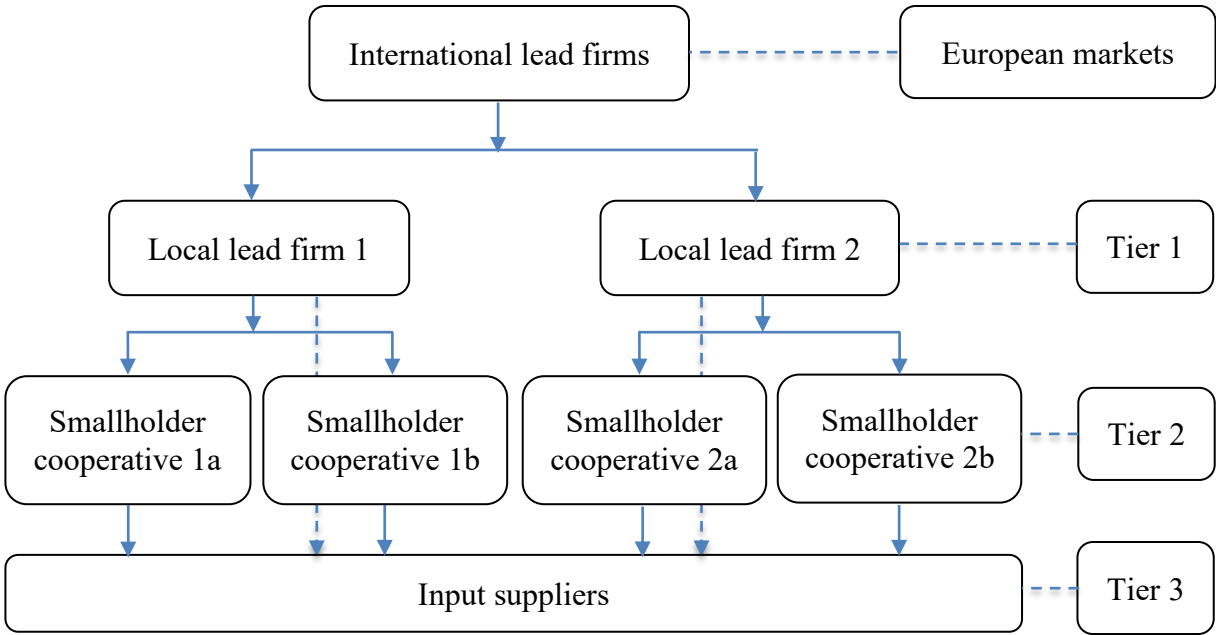


Figure 2: Global shrimp value chain analytical framework

### 2.2.1 Global value chain governance and shrimp production in Vietnam

The thesis departs from the analysis of the governance of GVC of shrimp production in which Vietnamese shrimp farmers participate, from which the role of the international lead firms will be identified and how they interact with local suppliers and local lead firms in Vietnam. In order to explore the role of the local lead firms in the transformation of smallholders' capabilities, the thesis controls for diversity of the international lead firms' role in GVC and the effects of the national/regional innovation system. The thesis takes two shrimp value chains connected to the European buyers with the same required standard. To control for regional diversity, the thesis selects local suppliers located in one province of Mekong River Delta, home of shrimp production of Vietnam (D-FISH<sup>11</sup> website). The required standard for shrimp farming is ASC<sup>12</sup> standards, which facilitates the adoption and practice of the smallholders' farming and processing enterprises for economic, social and environmental sustainability. In both shrimp value chains, the local lead firms are shrimp small and medium processing enterprises, in the value chain linkage with two smallholder cooperatives who share similar semi-intensive shrimp farming.

Vietnam has its agriculture growth in the direction of the open market for trade and investment with a greater role for private firms. Agriculture production tripled in volume terms between 1990 and 2013, outperforming all its major competitors in Asia (OECD, 2015). The agri-food sector is well integrated with international markets with total agri-food export value ratio to agricultural GDP of 70 to 80 percent. However, Vietnam's export-oriented agriculture faces the challenges to integrate into global markets due to the increasing market requirements on international sustainable standards, especially shrimp production for European import market. International lead firms who are dominating the GVCs and requiring local suppliers to comply with sustainable standards and certification, have limited role in local value chains. Meanwhile, local smallholders who are making up of more than 80 percent of Vietnam shrimp producers have limited technological capabilities to apply and practise such complex standards (VIFEP & Oxfam, 2016). In the Vietnamese shrimp industry, the international lead firms transfer their leading role to their tier-1 suppliers, the local lead-firms, who are governing the local shrimp value chains and playing an important role in transforming the technological

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<sup>11</sup> D-FISH stands for Directorate of Fisheries under the Vietnam Ministry of Agriculture and Rural Development

<sup>12</sup> ASC stands for Aquaculture Stewardship Council, the aquaculture standards required by the European markets (see <https://www.asc-aqua.org/what-we-do/our-standards/farm-standards/the-shrimp-standard/>)

capabilities of the smallholders. Thus, the thesis analyses the Vietnam shrimp production to explore the role of the local lead firms, as the key intermediary in GVCs.

The thesis expects to fill the gaps in the GVC governance literature by further exploration of the role of the local lead firms in the transformation of local shrimp production in Vietnam. The thesis aims to investigate the role of the local lead firms in the transformation of the smallholders' technological capabilities in GVCs through technological capabilities framework (Lall, 1992; Morrison, Pietrobelli & Rabellotti, 2008) in the following sections.

### 2.2.2 Technological capabilities and shrimp production in Vietnam

As discussed in the literature review, evidence from literature indicates that smallholders' technological capabilities required to participate in GVCs relate to their production capabilities in local value chains. The role of local lead-firms in codifying the required knowledge and transaction fosters the improvements of smallholders' technological capabilities, activities and innovation, from which it influences the local transformation for agriculture growth. Smallholders' technological capabilities in production management could be singled out of "investment", "production" and "linkage" capabilities, considering the functions they perform and degree of complexity (Lall, 1992).

The thesis adopted the combination of (i) production capability (ii) investment capability, (iii) linkage capability. As Lall (1992) argues, technological capabilities range from basic skills to more advanced and to the most demanding ones of research, design, and innovation. The thesis applies basic skills such as application, practice and management of sustainable production as well as advanced skills such as improvement, investment and innovation for the compliance to the required sustainable standards as an endogenous process of technological capability development within GVCs (Morrison, Pietrobelli & Rabellotti, 2008). Firstly, production capability covers production process, management and monitoring in the compliance of adopted standards. In which, collective and organisational operation and horizontal linkage skills are also analysed as key focuses for transformation of production capability. Secondly, investment capability covers analytical skills of cost & benefits of sustainable production, investment plan, contract and transaction negotiation. Finally, linkage capability is demonstrated with the linkage with local input suppliers and local lead firms in a close and sustainable value chain relations. The combined analysis of relevant technological capabilities helps examine the influencing role of the local lead firms to the smallholders'

obtaining and absorption of knowledge and technologies, practice and transformation of their production toward sustainability.

As a key intermediary in GVCs, the local lead firms affect the application and compliance of all local suppliers to the international standards, especially smallholders who have poor technological capabilities and are the least benefited actor. Following the literature review, the thesis expects that in value chains where the local lead firms have a more interactive role in sustainability activities, the smallholders have more improved and transformed production capabilities towards sustainability. Meanwhile, in value chains where local lead firms have a less interactive role towards sustainability, the smallholders' production capabilities are less or slowly transformed. The approach of production capabilities will be applied in two different value chains lead by two different local lead firms, from which the thesis measures how different roles they play in the transformation of production capabilities of two smallholder cooperatives and what are the key reasons of that difference.

As one of the top five shrimp export countries worldwide (FAO, 2018), Vietnam's total shrimp export in 2017 makes up 46 percent of total seafood export, reached US\$3.8 billion with increased rate of 22.3 percent, from which European market is potential to make up 22.4 percent with increased rate of 43.7 percent, in comparison with 2016 (VASEP, 2017). In order to meet the European market's requirements on sustainable shrimp production, local shrimp suppliers must improve their shrimp production and investment as well as re-structure their linkages, especially the smallholders also needs to re-organise their horizontal linkages in the cooperative, one of the weakest capability that affects their production improvements. The improvement of production management capacity fosters the application and practice of the European shrimp production standards, which, in return, increase the smallholders' opportunities in accessing the global markets, gaining better benefits and reinvesting in their sustainable production for their sustainable income. In local shrimp value chains, the local lead firms are playing the role in transferring the global knowledge and transforming the application and practice of smallholders in the conforming to the required sustainable production standards.

The thesis examines the influencing role of Vietnamese local lead firms to the transformation of the smallholders in Vietnam shrimp value chains, applying technological capabilities and GVC governance framework. The thesis aims to contribute to the gaps in the literature shedding some light into the prominent role that the local lead firms play in the transformation of the smallholders' technological capabilities towards sustainability. The following section presents the conceptual model of sustainable food and agriculture of FAO

(2014) and how the thesis interprets the model to investigate the Vietnam sustainable shrimp aquaculture production.

### 2.2.3 Sustainable agriculture and Vietnamese sustainable shrimp production

This thesis is concerned with the transformation to sustainable production of Vietnamese shrimp farmers and the role that the local lead firms play in this transformation. It is thus important to understand what is meant by sustainable agriculture. To fulfil the aim of the thesis, the conceptual model of sustainable food and agriculture of FAO (2014) is adopted to measure the practice of economic, social and environmental principles. The model provides principles to analyse how the smallholders in agriculture are able to transform their production in the compliance with the sustainable standards, how their technological capabilities might be enhanced under the influencing role and support by the local lead firms. The model includes 5 key principles that are analysed in mainstreamed GVC governance theory and technological capabilities approach in the Vietnam shrimp aquaculture production. The 5 key principles are explicitly interpreted in the aquaculture production in the Appendix 1.

Vietnam shrimp production is focusing on the market expansion to the European market, one of the biggest markets for Vietnam shrimp products that nearly doubled export revenue from 22.4 percent in 2016 to 43.7 percent in 2017 (VASEP, 2017). Thus, Vietnam shrimp industry has been oriented to practise and comply with ASC standards as required by European market. The application of ASC standards helps qualify sustainable shrimp production to access European market. ASC standards cover food safety, social and environmental principles, in which BEIA (Biodiversity and Environmental Impact Assessment) and p-SIA (participatory Social Impact Assessment) justify the basic compliance to the standards. The ASC standards align with the aquaculture production principles in the FAO's conceptual model of sustainable food and agriculture. The application of ASC standards ensures the Vietnam sustainable aquaculture and contributes to its ratification to the FAO's principles.

The application of the ASC standards required high competencies of shrimp smallholders who must restructure their collective linkage and management for the adoption, application, practice and monitoring the practice as well as for linkage with other partners in GVCs. The shrimp smallholders are unable to access and master the application without the supporting and influencing role the local lead firms who interact with the international lead firm for the standards' interpretation and compliance.



# 3 Methodology

This chapter describes the research design and methodology of the study. The chapter starts by positioning the philosophical stance. The philosophical point of departure in this thesis is social constructionism, which provides a foundation for re-constructing and understanding the global value chain governance framework, in which the role of the local lead firms is examined. This is achieved through interpretive analysis with a qualitative approach and case study as the research methodology. The strategies and process of data collection and data analysis are explained in detail to ensure a high level of transparency with regard to how the research was conducted. The chapter concludes by discussing strategies for achieving rigor and the quality of the study.

## 3.1 Research Methodology, Approach & Philosophy

The thesis employs qualitative research to seek for holistic understandings of rich, contextual and semi-structured data by engaging the research participants in a natural setting (Creswell, 2014). The qualitative method is suitable to understand the attitudes and behaviours observed in the locally social context. Qualitative research can further the topic by interpreting the collected data and explaining the undefined influence such as the role of the local lead firms in the local transformation towards sustainability (Saunders, Lewis & Thornhill, 2009).

The thesis uses interpretivism to explore the influences of the local lead firms to the degree levels of technological capability change of smallholders in agriculture production. The interpretivism emphasizes the necessity to understand dissimilarities concerning humans in their role as social actors (Saunders, Lewis & Thornhill, 2009). The thesis is concerned with the feelings and attitudes of different social actors who participate in the global value chains in the local context of developing countries. This approach, thus, is believed to create richer understandings and interpretations of each smallholders, smallholder groups, local lead firms and agencies who are either local value chain actors or supporting ones.

The thesis also uses inductive multiple qualitative approach (Gioia, Corley & Hamilton, 2013). Inductive approach is generally considered to be associated with the qualitative research (Gabriel, 2013) that is used to explore phenomenon, develop empirical generalisation and

identify preliminary relationships, themes or patterns for this thesis (Saunders, Lewis & Thornhill, 2009). The approach provides an accessible, systematic set of procedures for analysing qualitative data that produces reliable and valid findings for the research questions (Thomas, 2006). Therefore, the inductive approach fits well with the purpose of the thesis, aiming to explore the unknown or little-known area and construct new knowledge.

## 3.2 Research strategy

Case studies are employed in this thesis as it is a common method in qualitative research (Yin, 2003). The case study approach is recommended to develop an in-depth analysis of a case, often a program, event, activity, process, or one or more individuals (Creswell, 2014). The case study approach aims to analyse specific issues and is bounded by time and activity in a specific environment, situation or organisations, taking into account of the local context and actors at the ground (Strauss & Corbin, 2008). Detailed information in case studies is collected using a variety of data collection procedures over a sustained period of time (Yin, 2009).

The case study research is appropriate for exploratory studies. The case study research can focus on describing process, individual or group behaviour in its total setting, and/or the sequence of events in which the behaviour occurs (Stake, 2005). The thesis employs exploratory case study that aims to find answers to the questions of ‘who’, ‘what’ and ‘how’ with little control of the investigator over an event or the concerned phenomenon in a contemporary, real-life context (Yin, 2009).

In this thesis, the case, defined as “a phenomenon of some sort occurring in a bounded context” (Miles & Huberman, 1994, p.25) is the influencing role of the local lead firms in the transformation of the smallholders’ technological capabilities towards sustainability. In-depth case studies are chosen because they provide a more robust explanation for interpreting human behaviours in a specific context (Stake, 2013). A comparative analysis of two value chain cases provides opportunities for the researcher to explain the phenomenon through finding similarities and differences across cases (Stake, 2013).

This thesis aims to investigate the role of the local lead firms in the transformation of the smallholders’ technological capabilities towards sustainable agriculture production. Case studies tend to choose a small geographical area or a very limited number of participants as the

subjects of the thesis. The thesis focuses on the specific subject of GVCs of shrimp at local supply base in Vietnam in order to examine the topic in detail.

The effects of the local lead firms on smallholders’ capability transformation will be demonstrated in a comparative analysis of two local shrimp value chain cases led by two different Vietnamese processing firms in Bac lieu province in Mekong Delta area, the centre of shrimp production of Vietnam (D-FISH<sup>13</sup> website).

### 3.3 Selection of cases and data collection method

#### 3.3.1 Setting of the study

The chosen cases in this thesis are local shrimp value chains in the Bac lieu province in the Mekong Delta Area of Vietnam (Figure 3). Shrimp is one of the emerging export-oriented agricultural sectors in Vietnam over the past twenty years (VIFEP & Oxfam, 2016). Though local suppliers have been integrated into shrimp GVCs, the interaction between international lead firms and local suppliers is very limited and always through the local lead firms, as the intermediary at the supply base. By comparing two cases (two value chains with different local lead firms but located in the same region), the thesis is able to identify the influencing role of the local lead firms in local shrimp value chains, the similarities and differences between the degrees of technological capability transformation under the influence of two differently local lead firms.

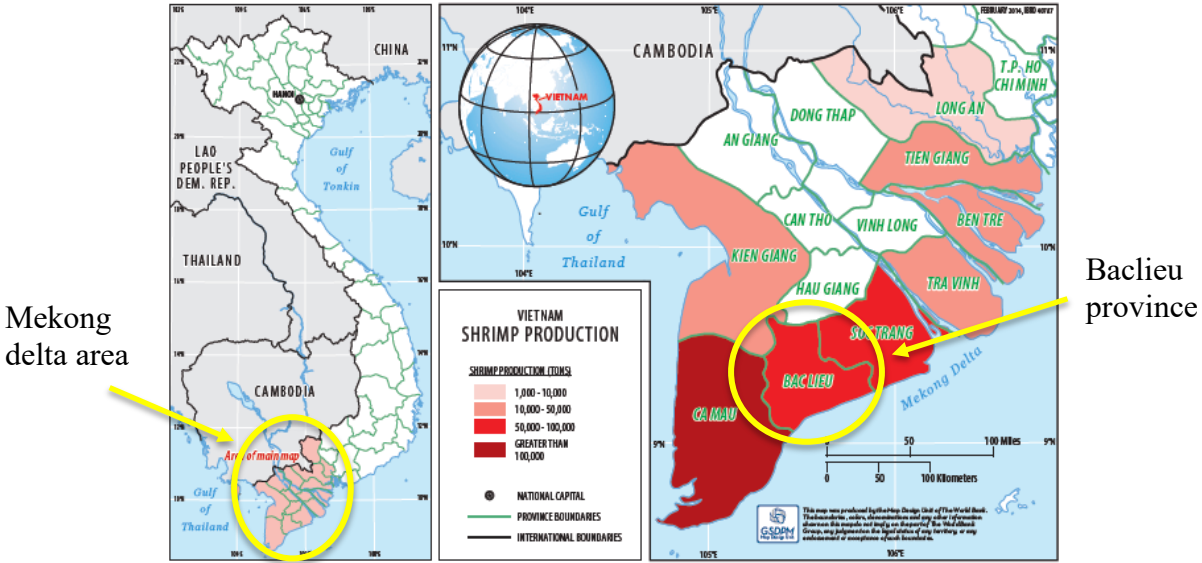


Figure 3: Bac lieu and Mekong Delta of Vietnam map (Figure 3.1, The World Bank, 2014, p.34)

<sup>13</sup> D-FISH stands for Directorate of Fisheries under the Vietnam Ministry of Agriculture and Rural Development

### 3.3.2 Case selection and description of cases

The selection of the cases was done using a purposeful sampling strategy (Pratt, 2009; Gartner & Birley, 2002, Palys, 2008). Two value chains are selected in (1) the same semi-intensive shrimp farming technique for similar context, production technology, investment scale and GVC governance (2) the same regional innovation system of one province to control the effects of this variable and (3) the same European export market with similar market standard (ASC<sup>14</sup> standards) to control the variable of different effects by the international lead firms. Global shrimp value chain framework (Figure 2) is specifically applied in the selected cases in the Bac lieu province of Vietnam (Figure 4) which describes the specific typology of Vietnam shrimp GVC governance at international and local stages. From which, the thesis examines the role of the international and local lead firms to the transformation of the smallholders’ technological capabilities towards sustainability of shrimp production.

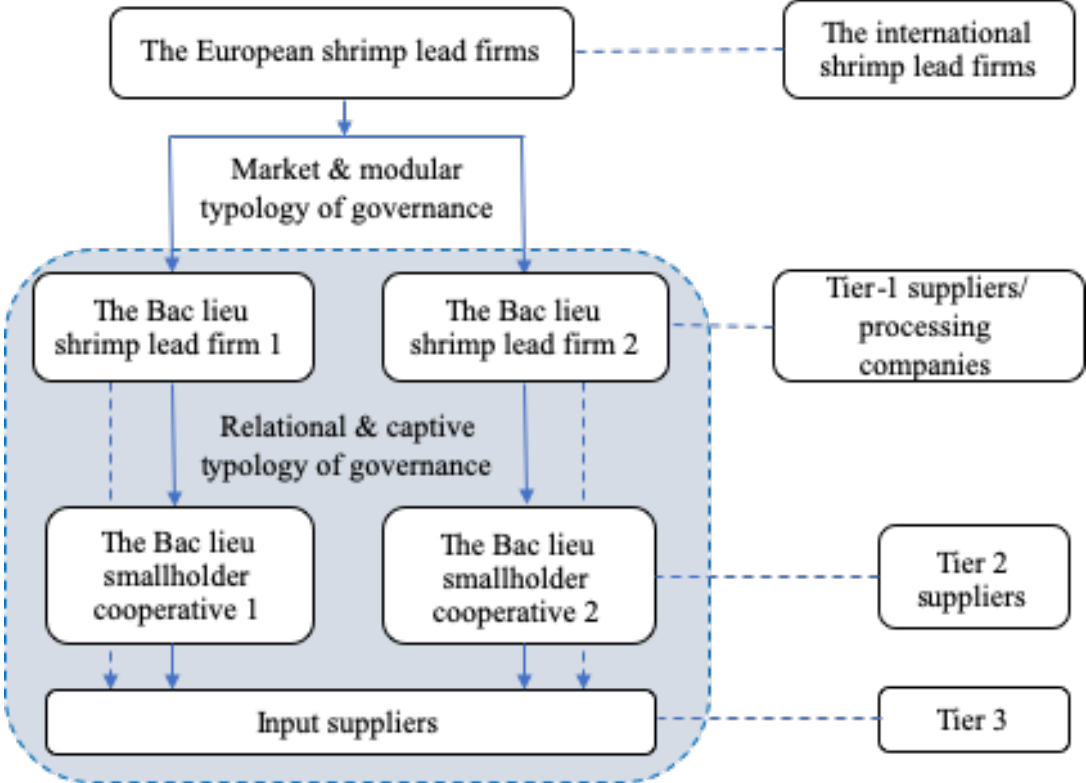


Figure 4: The Bac lieu (of Vietnam) shrimp value chain framework

To fulfil the purpose of the thesis in investigating the role of the local lead firms in the transformation of local production towards sustainability, firstly the thesis defined the GVC governance, from which recognised the typology of a mixed market and modular governance

<sup>14</sup> ASC stands for Aquaculture Stewardship Council, the aquaculture standards required by the European markets (see <https://www.asc-aqua.org/what-we-do/our-standards/farm-standards/the-shrimp-standard/>)

in international stage and a mixed of relational and captive governance in local value chains. The two value chains selected for this thesis portray similar governance mechanisms upstream (from local suppliers to the local lead firms) and downstream (between the local lead firms and the international lead firms).

Downstream, the relationship between the international lead firm and the local lead firm can be characterised as market and modular. The simple market linkage between the international lead firms and their tier-1 suppliers is governed by price. The international lead firms easily codify their sourcing transactions with complex information and requirements on internationally sustainable standards. They govern their tier-1 suppliers who are considered to be highly competent suppliers. However, most of their tier-1 suppliers are sourcing shrimp from smallholders who have low competencies, especially in sustainable production practices to meet their increasingly complicated requirements.

Upstream, the relationship between the local lead firms and the smallholders and local suppliers can be defined as relational and captive. While tacit information and knowledge is exchanged between the local lead firms as key local buyers and the smallholders who are not competent to comply with the complex sustainable production standards required by global markets and provided with detail instructions by the local lead firms. Those relationships in the local value chains are governed by either trust or local buyer power in each specific case.

The cases suggest that the local lead firms and smallholders tend to be dependent upon each other through social and spatial proximity, value chain contracts for sustainable production, which foster and enhance learning and transformation. This is in line with Pietrobelli & Rabellotti (2011) when they suggested that transactions are complex and not easily codified in relational chains, and in captive chains the lead firms intervene actively in the learning processes of the suppliers that lack competences.

Due to the nature of the research design and aims and objectives, the following criteria were used to select two shrimp value chain cases for interviews:

- Local value chains in Bac lieu province, each includes one local lead firms and one smallholder group (the cooperative under Vietnam's Cooperative Law);
- Two Vietnamese local lead firms are SMEs exporting to European markets;
- Value chain contracts signed and implemented in 2017-2018;
- Practising and certifying ASC standards for their production; and
- Joined EU-funded sustainable shrimp value chains development project;

To strengthen the pattern recognition of the influences of GVC governance in local technological capability transformation of smallholders, cases were selected to represent and emphasizes a comparison between extreme differences (Pettigrew, 1990). The two value chain cases are also selected based on the different degree of transformation of the smallholders' technological capabilities observed, from which the thesis explore what and how these local lead firms influence the smallholders' transformation. Specifically, the value chain case 1 is observed to be a “good case”, in which the Bac lieu smallholder cooperative 1 is at higher degree of transformation since its contracting with the Bac lieu shrimp lead firm 1. Meanwhile, the value chain case 2 is observed to be “common case”, in which the Bac lieu smallholder cooperative 2 is at lower degree of transformation since its contracting with the Bac lieu shrimp lead firm 2 (Figure 4).

The participants in each value chain case includes the director of the cooperative, one member of the cooperative's management board, two members and sustainability manager and quality staff of the local lead firms that meet the following requirements:

- Work in the cooperatives or the local lead firms;
- Participate in the value chains;
- Above 18 years old;
- Communicate in Vietnamese; and
- Live and work in Bac lieu province of Vietnam;

The thesis employs snowball techniques for the identification of key actors. The snowball technique aids in generating more potential contacts, each referred by the prior contacts (Saunders, Lewis & Thornhill, 2009). From the first contact, a Project Coordinator of sustainable shrimp value chain development in the Bac lieu province, I gained further acceptance from the Bac lieu smallholder cooperatives' directors and sustainability managers of the Bac lieu local lead firms. Then from these leaders, I also gained more contacts from these cooperatives and local lead firms.

### 3.3.3 Conducting interviews

The thesis employed multiple data sources (archives, reports, documentations and materials, photographs, seminar documents value chain contracts with semi-structured interviews to obtain retrospective and real-time accounts by those people experiencing the phenomenon of theoretical interest (Gioia, Corley & Hamilton, 2013). The multiple data sources and semi-structured interview aims to address well-specified research question.

Interviews were chosen to collect primary data for this thesis for the following reasons. First, the use of in-depth discussion is helpful in seeking for the meaning and core reasons for a phenomenon to understand the process of timing, stages or development of event (Morse & Richards, 2002). The study aims to discover the role of the local lead firms to the transformation of technological capabilities of smallholder groups in local shrimp value chains. Second, type of interview was semi-structured interviews since it consisted of several key questions that help define the areas to be explored but also allowed both the interviewer or interviewee to diverge in pursuing an idea or response in more details (Britten N., 1999).

A list of suitable interviewees for the study was established. The interview guide was sent in advance to participants to be reviewed alongside the ethical consent form, which clearly states the purpose of the thesis, the reasons for which the participants are chosen, and how data would be processed. The interviews were conducted in Vietnamese language through online channels (Skype, Zalo). The interview was structured around 04 sections enquiring about (1) preliminary information, (2) current status of GVC governance and application of sustainable production practices, (3) the role of the local lead firms and (4) technological capabilities of smallholders towards sustainability. Appendix 2 includes the interview guide and questions.

During online interviews, I ensured that the interviewees correctly understand all of the information presented to them. I also ensured friendly atmosphere and social communication during interview. The technique of laddering questions was used to follow up questions with the aim of creating a more thorough understanding of the subject discussed. This technique assisted in reaching saturation by asking questions until everything relevant was explored and no new insights emerged (Reynolds & Gutman, 1988).

An inductive study of two Bac lieu shrimp value chain cases that consists of two smallholder cooperatives and two local lead firms in the Bac lieu province were conducted in April of 2019. In addition, the interview of outsiders who are not shrimp value chains actors was also used to provide more information regarding the context of each value chain case and justify similarities or differences between cases. A total of 14 interviews were conducted with the Bac lieu smallholder cooperatives and the Bac lieu local lead firms as well as local supporting agencies. The interview questions are in Appendix 2.

Each value chain case had 6 interviews, including the director of the cooperative, a member of management board and two members of the cooperative as well as a manager and a staff of the local lead firm. The case 1 includes interviews from 01 to 06 while the case 2 includes interviews from 07 to 12. Additionally, two interviews with supporting agencies

(interview 13 and 14) are also implemented as multiple informant source. The neutral view of value chain outsiders provides further justification of the influencing role of the local lead firms. Each interview was conducted in Vietnamese and lasted approximately 40-60 minutes. I am the native Vietnamese speaker to conduct the interviews. During the process of data generation, audio recording was used. The recording was then transcribed before data analysis started. There are total of 197 pages of transcripts collected and these were recorded in Vietnamese. The Table 1 below presents the interviews with list of interviewees to be coded. Interview and interviewees codes are used interchangeably in the analysis.

*Table 1: Sample of two shrimp value chain cases with number of interviews*

	<b>Interviewee</b>	<b>Number of interviews</b>	<b>Time interview (minute)</b>	<b>Code of interview</b>
Case 01	Sustainability Manager of the local lead firm 1	1	62	Interview 01
	Sustainability staff of the local lead firm 1	1	43	Interview 02
	Director of the Cooperative 1	1	78	Interview 03
	Technical Manager of the Cooperative 1	1	40	Interview 04
	Member of the Cooperative 1	1	51	Interview 05
	Member of the Cooperative 1	1	33	Interview 06
Case 02	Sustainability Manager of the local lead firm 2	1	51	Interview 07
	Sustainability staff of the local lead firm 2	1	40	Interview 08
	Director of the Cooperative 2	1	63	Interview 09
	Technical Manager of the Cooperative 2	1	66	Interview 10
	Member of the Cooperative 2	1	58	Interview 11
	Member of the Cooperative 2	1	42	Interview 12
Multiple sources	Leader of local NGO	1	64	Interview 13
	Leader of local agency	1	52	Interview 14
	<b>Total</b>	<b>14</b>	<b>743</b>	
(Total transcripts of 197 pages; single line spacing, font 12)				

Furthermore, secondary data such as photographs, value chain contracts, reports and archival documents were collected as supplements for the findings of the interviews.

### 3.3.4 Limitations of the thesis

Although the study presents broadly analytical frameworks that investigate the role of the local lead firms in the transformation of the smallholders' technological capabilities towards sustainable agriculture production, it has a number of limitations.

One limitation is that the study interviews were conducted through Skype and Zalo (a Vietnamese internet-based protocol). Internet connection in where the interviewees are living is sometimes limited that affects audio quality of interviews. It might make difficult in listening



and consume energy while potential breaks might destroy the flow of conversations (Weller, 2015). In addition, local accent of the interviewees in the Bac lieu province might affect the understanding, audio recording and transcription. Moreover, the skype/zalo interviews face the challenges of building rapport due to limited interactions between the interviewee and the interviewer that offline face to face interviews can offer (Weller, 2015; LoIacono, Symonds & Brown, 2016). The interviewees, especially the smallholders in rural areas of developing countries who are familiar with face to face conversations are difficultly articulate and perceptive the digital or online interactions. Another limitation is that the interviews were conducted in Vietnamese and then translated by me that might reflect my subjective perspective in using indirect information filtered or coded. Due to time limitation, I could not use peer review or cross-coding method to justify the data analysis (Creswell, 2014), though the thesis was reviewed by a peer who has rich experience in both academic research of GVC governance and Vietnam's shrimp industry. One additional limitation is that the interviewer does not see the context in which the interview is taking place, which sometimes is important for the interpretation.

Future interviews' rounds and analysis should be conducted by offline face to face and with other researchers or collaborators to provide better audio quality and more objective insights that would allow me to draw more accurate conclusions.

### 3.3.5 Data analysis

The thesis applies the first-order code and second-order code analysis to firmly structure workable themes and concepts for aggregate dimensions of data structure (Gioia & Pitre, 1990; Gioia, Corley & Hamilton, 2013, Evansluong, 2016; Evansluong, Ramirez Pasillas & Nguyen Bergström, 2019). Data analysis can be found in chapter 4 empirical analysis that consists of 4.1 findings and 4.2 cross-case comparison.

- **Step 1:**

At the first level of coding, I started reading the interview transcripts and information from secondary sources. At the same time, I also combined listening to the audio files several times to gain more in-depth understanding and attached-emotion to the case study that helps facilitate me to recall the interviews to analyse the data better. In each interview and value chain case, relevant information was coded and copied into a new document, resulting in a large number of first codes across interviews and cases that were arranged into different categories

of activities. The primary codes wordings were very close to the interview transcripts (Gioia, Corley & Hamilton, 2013, Evansluong, 2016; Evansluong, Ramirez Pasillas & Nguyen Bergström, 2019). Table 2 summarizes the first-order codes resulting from the cross-cases.

Table 2<sup>15</sup>: Cross-case first-order codes

Within-case first-order codes	Cross-case first-order codes
The role of processing company enhancing the access to sustainable standards, building the application procedures, providing guidance and supporting the practice and monitoring.	1a1. The role of the local lead firms enhancing knowledge and access to sustainable production standards by the smallholders
The role of processing company supporting the access to and practice of sustainable standards, and monitoring the smallholders' practice	
The role of processing company on the improvement on production method and process in compliance with ASC standard	1a2. The role of the local lead firms improving production processes and plan of the smallholders towards sustainability
The role of processing company on the improvement on production method and process in compliance with ASC standard	
The processing company's value chain contract influences on the improvement in production organisation and management for sustainable production	1b1. The role of the local lead firms enhancing organisational, operational and management skills of the smallholders towards sustainable production
The processing company promotes the changes in organising and collaboration among the smallholders for sustainable production	
The processing company motivates the open discussion, participation, benefit sharing and transparency in the cooperative.	1b2. The role of the local lead firms promoting horizontal linkages among the smallholders.
The processing company promotes shared-benefits and voice and transparency in the cooperative through the implementation of value chain contract	
The smallholders care more about the formulation of value chain contract provisions with the processing company	2a1. The role of the local lead firms in contract and negotiation skills by the smallholders
The smallholders participates more in the discussion and analysis of investment under the value chain contracts with the processing company	
The smallholders care more the balancing between reduced production cost and increased positive environmental impacts	2a2. The role of the local lead firms improving cost & benefit analysis skill of the smallholders
The smallholders' capacity in cost & benefit analysis is improved to implement value chain contract	
The smallholders have stronger power relation, voice and negotiation skills with input suppliers for traceability in compliance with sustainable standards	3a1. The role of the local lead firms on the smallholders' capabilities to implement transactions with input suppliers for product traceability by the smallholders
The processing company guides and promotes interaction and partnerships with input suppliers for traceability for application of sustainable standards	
The smallholders evaluate and monitor the cooperation with the processing companies, their social welfare policies and business ethics	3a2. The role of the local lead firms on the smallholders' capabilities to monitor and evaluate value chain and business strategy
The smallholders assess the realization of the processing companies' commitments	

<sup>15</sup> The company(ies) or processing company(ies) in all excerpts and tables refer to the local lead firm(s)

- **Step 2:**

The second-order code was interpreted by reviewing the combination of the cross-case first codes and documents consisted of texts from each interview and case and the literature review (Marshall & Rossman, 1995). Under the existing literature, I interpreted data, grouped the primary codes into themes and organised them into more abstract level in Table 3 (Strauss & Corbin, 1998, Evansluong, 2016; Evansluong, Ramirez Pasillas & Nguyen Bergström, 2019).

*Table 3: Cross-case second-order codes*

<b>Cross-case first-order codes</b>	<b>Literature</b>	<b>Cross-case second-order codes</b>
1a1. The role of the local lead firms enhancing knowledge and access to sustainable production standards by the smallholders	The complexity degrees of transaction in GVCs and knowledge of new sustainable production standard, that smallholders are unable to access, require the role of the local lead firms in transferring knowledge and supporting for practice	1a. PRODUCTION: The role of the local lead firms in the adoption, application and practice sustainable production standards
1a2. The role of the local lead firms improving production processes and plan of the smallholders towards sustainability		
1b1. The role of the local lead firms enhancing organisational, operational and management skills of the smallholders towards sustainable production	The smallholders are unable to access GVCs and sustainable production standards due to their weak horizontal linkage, which require a motivation and influence for change by the local lead firms.	1b. PRODUCTION: The role of the local lead firm supporting changes in production organisation and management models by the smallholders
1b2. The role of the local lead firms promoting horizontal linkages among the smallholders.		
2a1. The role of the local lead firms in contract and negotiation skills by the smallholders	The value chain contract and investment by the local lead firms to support for the application of sustainable standard foster skills of analysing investment cost, contract conditions and production cost.	2a. INVESTMENT: The role of the local lead firms implementing cost & benefit analysis and investment plan in sustainable production
2a2. The role of the local lead firms improving cost & benefit analysis skill of the smallholders		
3a1. The role of the local lead firms on the smallholders' capabilities to implement transactions with input suppliers for product traceability by the smallholders	The application of sustainable standard requires traceability and monitoring that are implemented by and with the local lead firms' support and influences.	3a. LINKAGE: The local lead firms' role on implementing and maintaining value chain partnerships for sustainable production
3a2. The role of the local lead firms on the smallholders' capabilities to monitor and evaluate value chain and business strategy		

- **Step 3:**

In the last step, the themes of cross-case second order codes were considered. I reviewed the themes together with the interview transcripts for additional evidence of each theme in each case (Gioia, Corley & Hamilton, 2013; Evansluong, 2016; Evansluong, Ramirez Pasillas & Nguyen Bergström, 2019). I organised all themes into the last level of abstract as aggregate dimensions (see Table 4).

Table 4: Aggregate dimensions

Cross-case second-order codes	Literature	Aggregate dimensions
1a. PRODUCTION: The role of the local lead firms in the adoption, application and practice sustainable production standards	The influence of tier-1 supplier in GVCs in the local value chains in transferring and interpreting knowledge to local suppliers as a key intermediary in GVCs	1. PRODUCTION: The local lead firms' influence on the transformation of the smallholders' production capability in sustainable production
1b. PRODUCTION: The role of the local lead firm supporting changes in production organisation and management models by smallholders		
2a. INVESTMENT: The role of the local lead firms implementing cost & benefit analysis and investment plan in sustainable production	Investment capability covers the skills of identify, preparedness, obtaining benefits and cost analysis	2. INVESTMENT: The role of the local lead firms on the smallholders' investment capability in sustainable production
3a. LINKAGE: The local lead firms' role on implementing and maintaining value chain partnerships for sustainable production	The implementation and maintenance of value chain relations enhance linkage capability of the smallholders	3. LINKAGE: The local lead firms' impact on the transformation of the smallholders' linkage capability in sustainable production

Data analysis can be found in chapter 4 empirical analysis that consists of 4.1 findings and 4.2 cross-case comparison. Data structure of the thesis's analysis that includes first-order codes, second-order codes and aggregate dimensions is presented in Figure 5 (p. 33).

### 3.3.6 Ethical considerations

Ethical considerations must be taken into account in all areas of the research. This qualitative research requires frequent interactions with the research participants, it is important to employ an ethically sound approach. The thesis gains ethical approval from the Lund University School of Economics and Management before undertaking research involving human participants. Participants are informed of the purpose of the thesis, the student and the supervisor, affiliations, and possible conflicts of interest, about which an ethical consent form is signed. The consent form is included in Appendix 3. Participants are able to withdraw from the research at any time without any reason if they no longer wish to participate. If they wish to withdraw from the research after some of their data has been collected, participants would be asked for their consent if the collected data will be retained and included in the thesis. If these participants prefer, the collected data could be destroyed and not included. However, they are also informed that it would not possible to withdraw their data from the research once the research has been completed and the data has been analysed. Personal details, including participants' name and address, will be kept confidential and not disclosed to third party.

## 4 Empirical Analysis

This chapter describes the empirical analysis of the study in the role of the local lead firms in the transformation of the smallholders' technological capabilities in 4.1.1 production, 4.1.2 investment and 4.1.3 linkages. In each section, the commonalities as well as the discrepancies in the degree of the role of the local lead firms were presented. The explicit cross-case comparison in 4.2 summarised the commonalities and discrepancies of the two cases to further the understanding of degree in the influencing role of the local lead firms in the transformation of smallholders' technological capabilities towards sustainability.

### 4.1 Findings

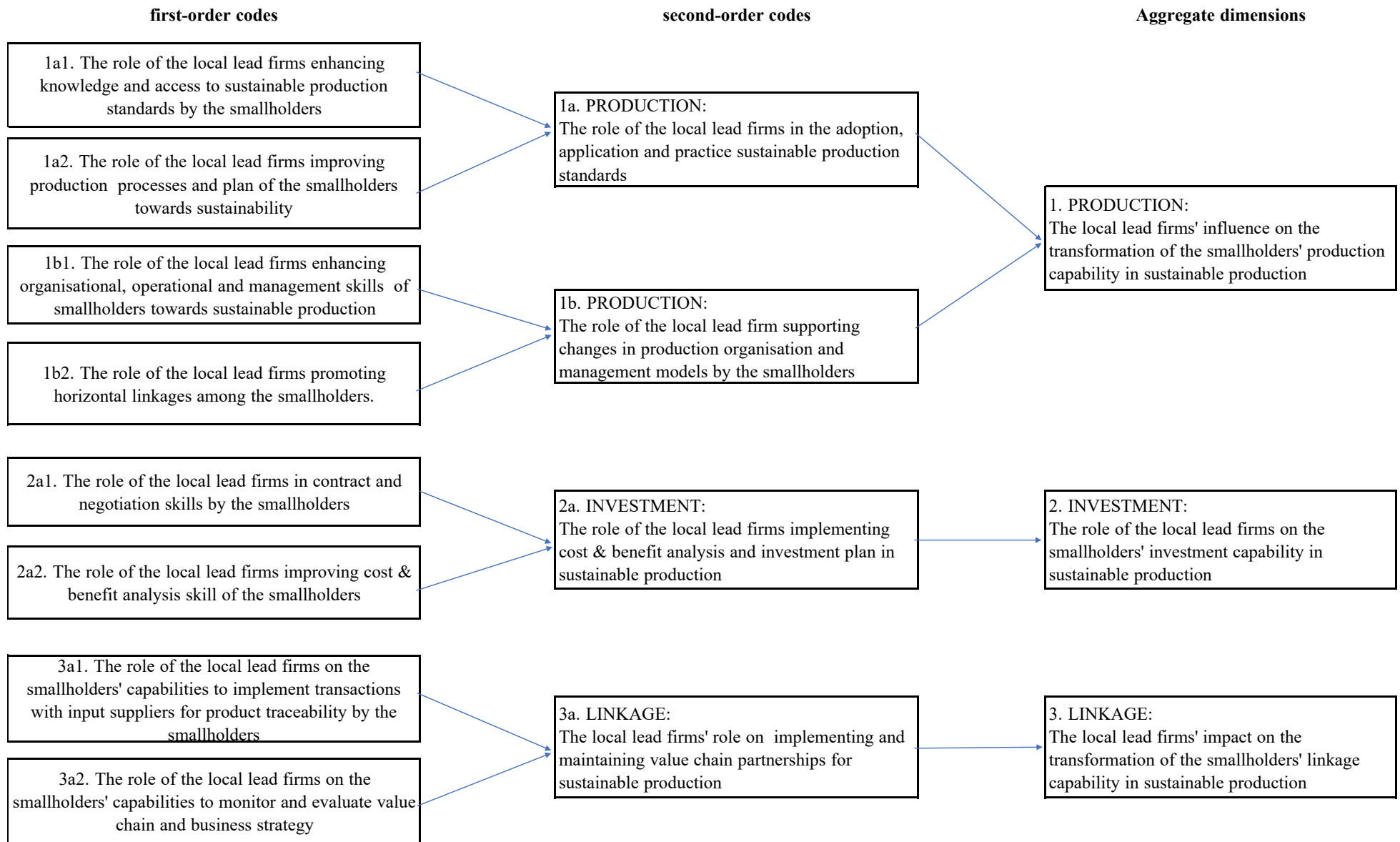
The thesis further explores the role of the local lead firms in the transformation of technological capabilities of smallholders towards sustainability. The process of analysing data results is demonstrated in a data structure (Figure 5, p. 33). The data structure contains three aggregate dimensions (1) the local lead firms' influence on the transformation of smallholders' PRODUCTION capability in sustainable production and standard compliance (2) the local lead firms' influence on the improvement of smallholders' INVESTMENT capability for sustainable production, and (3) the local lead firms' impact on the transformation of smallholders' LINKAGE capability in sustainable production.

The aggregate dimension (1) the local lead firms' influence on the transformation of smallholders' production capability in sustainable production and standard compliance is composed of theme (1a) the influence on the adoption, application and practice sustainable production standard, and theme (1b) the influence on the changes in production's organisation and management models by smallholders. In which, theme (1a) consists of (1a1) enhancing knowledge and access to sustainable production standards and (1a2) improving production processes and plan towards sustainability, while theme (1b) consists of (1b1) enhancing organisational, operational and management skills towards sustainable production and (1b2) promoting horizontal linkages among smallholders.

The aggregate dimension (2) the local lead firms' influence on the improvement of smallholders' investment capability for sustainable production through theme (2a): the influence on the implementation of cost & benefit analysis and investment plan in sustainable production, which includes (2a1) implementing contract and negotiation skills and (2a2) improving cost & benefit analysis skill of the smallholders.

The last aggregate dimension (3) the local lead firms' impact on the transformation of smallholders' linkage capability in sustainable production comes from the theme (3a): The local lead firms' influence on implementing and maintaining value chain partnerships for sustainable production which refined by (3a1) implementing transactions with input suppliers for production traceability and (3a2) monitoring and evaluation of value chains and business strategy.

Figure 5: Data structure



#### 4.1.1 The local lead firms' influence on the transformation of smallholders' production capability

The findings suggest that the transformation of the smallholders' production capability towards sustainability is achieved through the supporting role of the local lead firms in (1a) the adoption, application and practice of sustainable production standards and (1b) changes in production organisation and management models by smallholders. These two codes (1a) and (1b) are coupled factors that ensure the production capability of the smallholders to transform their production towards sustainability (4.1.1).

##### 1a. The role of the local lead firms in the adoption, application and practice of sustainable production standards

The influence from the local lead firms in the adoption, application and practice of sustainable production standards involves (1a1) enhancing knowledge and access of smallholders to sustainable production standards and (1a2) improving their production processes and plan.

##### *1a1. The role of the local lead firms enhancing knowledge and access to sustainable production standards by the smallholders*

The enhancement of knowledge and accessibility to sustainable production standards by the smallholders is the result of the supporting role of the local lead firms (1a1) in: (i) building application procedures, providing guidance for the practices and monitoring the application and (ii) supporting the access and practices and monitoring the smallholders' practice (see Table 2).

In both cases, the local lead firms interpret the requirements of those practices into "smallholders' languages", and in return, to interpret the smallholders' tacit knowledge and traditional experience into the formally legal-accepted papers in the pursue of sustainable production standards and certifications. As disclosed by the technical manager of the Cooperative 1 (interviewee 04), the role of the local lead firms is "relatively important" for the smallholders' accessibility and practice of sustainable production standards. The interviewee 04 said: *"I must use the phrase 'relatively important' to describe the role of the company"<sup>16</sup>.*

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<sup>16</sup> The company(ies) or processing company(ies) in all excerpts and tables refer to the local lead firm(s)



*They guide us how to apply so that we can do it easily. Without them, it is hard for us to master the standards and practise correctly*". The sustainability manager of one of the local lead firms stated that: *"Without us, the smallholders are unable to understand the standards. They have rich knowledge and experience of farming shrimp but have non or very limited knowledge in sustainable production standards"* (interview 01). Other interviewees confirmed the non-presence of the international lead firms in their practices and compliance to the ASC standards and shared the view of the role of the local lead firms in the following table (Table 5).

*Table 5<sup>17</sup>: Further evidence of support to enhance knowledge and access to sustainable production standards by the smallholders*

<b>Case</b>	<b>Interviewee</b>	<b>Excerpt</b>
Case 1	Interviewee 01	"ASC standard requires BEIA report (Biodiversity Environment Impact Assessment) which is very complex, and we must support them to do"
Case 1	Interviewee 02	"Our company has to manage all production process from farms to the factory and ensures traceability of products for export while our buyers only visit farms without any support"  "We develop the procedures and train them how to apply, monitor and correct their practice, update them with new technologies and experience"
Case 1	Interviewee 03	"ASC practice is quite different than traditional shrimp farming [...] and too difficult for us due to our limited capabilities. We practise with much efforts and strong support from the company who needs to build their sustainable sourcing"  "The company establishes a task force team to work with us. They first send us manuals and procedures, guide us directly at site as leaning by doing. Then they support us to correct our errors and adjust the procedures. They are always available whenever I call"
Case 2	Interviewee 07	"International buyers check if our company have cooperative farming certified by ASC, they make their assessment visit"  "We, together with the cooperative's management board to support their practice, remind and correct the errors. We provide further guidance but dismiss anyone who do not practice"
Case 2	Interviewee 08	"We provide gradual, detail and even little things to every individual. We create a chatting zalo group to notice and update whatever we need. I always visit to check how they practise"
Case 2	Interviewee 09	"The company needs sustainable materials for their processing, so they collaborate with us, support us to practice and monitor our compliance, invest in the auditing as well"  "The company establishes a team who supports us to practice at farms and complete our documents in accordance with the standard. Before, we did by our traditional experience"
Case 2	Interviewee 11	"It is very difficult for us to practise and comply with ASC standards. [...] as smallholders, we must be united and well-managed which is difficult without the company's support"  "We discuss whenever we get errors and they provide us with the corrections, motivate us to do and monitor later"

<sup>17</sup> The company(ies) or processing company(ies) in all excerpts and tables refer to the local lead firm(s)

Agreeing with the prominent role of the local lead firms, the interviewee 13, who is providing support to the smallholders indicated that: *“The processing companies<sup>18</sup> play an intermediary role to link with international in sourcing and transferring knowledge and supporting the smallholders in practice and compliance with sustainable production”* and *“The smallholders have tacit knowledge in farming shrimp without any understandings and practice of sustainable production, the compliance system or documents, and traceability. Therefore, only the local lead firms who share common target of sustainable production are the key actors to enhance knowledge and support smallholders to access to the standards”*. Explaining why the local lead firms play such important role in the transformation of the smallholders’ technological capabilities, interviewee 13 added: *“The most important factor for the smallholders to practice sustainable production is the favourable conditions of value chain contracts, in which they can gain equal benefits”* (interview 13).

Through the enhanced knowledge and accessibility to sustainable production (1a1), the smallholders improve their production processes and plan towards sustainability (1a2) that is analysed in the next section.

#### *1a2. The role of the local lead firm improving production processes and plan of the smallholders towards sustainability*

The smallholders in agricultural value chains must re-structure production process and plan to be compliant with the required sustainable standards in order to supply high volume and qualified products to the local lead firms. The role of the local lead firms improving production processes and plan of the smallholders towards sustainability (1a2) is the result of the improvements of production methods and process in the compliance with ASC standards that facilitated by the local lead firms under the value chain contracts in both cases (Table 2). The commonalities and discrepancies in the improvement of production processes and plan of the smallholders towards sustainability are analysed in this part. The director of the Cooperative 2 indicated (interviewee 09): *“So far, our practice of 80 percent compliance is a great achievement anyhow. There are still some errors, but our management board continues updating and correcting them for full compliance”*. The role of the local lead firms improving production processes and plan of the smallholders towards sustainability (1a2) is supported by further evidence in the Table 6 below.

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<sup>18</sup> The company(ies) or processing company(ies) in all excerpts and tables refer to the local lead firm(s)

Table 6<sup>19</sup>: Further evidence of the role of the local lead firms improving production processes and plan of the smallholders towards sustainability

Case	Interviewee	Excerpt
Case 1	Interviewee 01	“[...] they now always check the ingredients of the aquatic feeds and pro-biotics before using or check the originals of breeds and require bill of health disease”
Case 1	Interviewee 02	“[...] they do the daily log-book greatly instead of assessing based on their sense or experience. Their document collection and filing are also great”
Case 1	Interviewee 03	“Our production process entirely changes in accordance with ASC standard. [...] for example, we previously used harmful chemicals. Since we practice ASC, there is no more complains from surrounding community and no more conflicts with them”
Case 1	Interviewee 06	“In compliance with ASC standards, our shrimp products are clean and safe, we must protect environment correctly, waste water must be treated separately, rubbish are classified and treated also. The surrounding community are so satisfied with the improvement in our production method”
Case 2	Interviewee 07	“Some smallholders are unable to breed the water together with others, we advise the cooperative to use our supporting expense to buy their breeds, so that they have collective farming and harvest”
Case 2	Interviewee 08	“The practice of smallholders reaches from 80 to 90 percent of the required compliance, sometimes they forget so we must remind and repeat the training and guidance”
Case 2	Interviewee 11	“Now we do breeds stocking together, so that we can buy guaranteed quality breeds and our technicians can support and monitor our process better”
Case 2	Interviewee 12	“Since ASC practice, our capacity in production planning is transformed remarkably. In the past, we did without any plans and followed our own individual process, but now we comply with the required production process. If 4 is previous score, 7 will be the current one”

In line with assessment of both value chain cases on the smallholders’ improvements in production processes and plan and the role of the local lead firms (1a2), the local agencies’ leaders extremely assessed the similarities and differences in those improvements of smallholders as well as the degrees of the role of the local lead firms: *“The cooperative 2 has made a collective production plan in which they buy and sell together with detail harvest schedule. They have created an investment fund that supports for collective purchase. The*

<sup>19</sup> The company(ies) or processing company(ies) in all excerpts and tables refer to the local lead firm(s)

*Cooperative 1 has done even better because they started from nothing without any cooperative knowledge and experience” (interview 13) and “Both cooperatives have enhanced their knowledge and practice of sustainable production and compliance. However, the cooperative 1 is a bit better in collective production planning due to the stronger role of the local lead firm and more favourable conditions of value chain contract. They have arranged their own shrimp collection and logistics service for the local lead firm” (interview 14). Responding to the interviewer’s question of scoring the improvements in production processes and plan of two value chain cases, the interviewee 13 said: “the cooperative 2, who scored 5/10 with previous supports in sustainable production from local agencies, gets 8/10 now. Meanwhile, the cooperative 1, who did score 3/10 before and gets 9/10 currently” (interview 13).*

The above findings describe the role of the local lead firms in the adoption, application and practice of sustainable production standards by the smallholders (1a). That is correlated to the changes in production organisation and management models by the smallholders. The role of the local lead firms in the changes in production organisation and management models by the smallholders (1b) is presented in the following section.

#### **1b. The role of the local lead firms supporting changes in production organisation and management models by the smallholders**

The changes in production organisation and management models by the smallholders is achieved through the supporting role of the local lead firms in (1b1) enhancing organisational, operational and management skills of the smallholders towards sustainable production and (1b2) promoting horizontal linkages among the smallholders. These two themes (1b1 and 1b2) ensure the smallholders’ collective operation and management models (1b) and at the same time foster the application and practices of the sustainable production standards (1a), which support the role of the local lead firms in the transformation of the smallholders’ production capability (4.1.1).

##### *1b1. The role of the local lead firms enhancing organisational, operational and management skills of the smallholders towards sustainable production*

Under the value chain contract conditions with the local lead firms, the smallholder cooperative must restructure their organisation, operation and improve their management capacity. The supporting activities and implementation of the contractual commitments by the

local lead firms strongly affect the enhancement of organisational, operational and management skills of the smallholders (1b1). This is the outcome of (i) the improvement of the smallholders’ production and management and (ii) the changes in organising and collaborations among the smallholders towards sustainability (see Table 2). The technical manager of the Cooperative 2 shared that: *“We did not care much how we farmed before. Our practice changes now. We think better and act better and we manage better”* (interview 10). The Table 7 below shows additional excerpts of other interviewees regarding this sharing.

*Table 7<sup>20</sup>: Additional excerpt of the role of the local lead firms enhancing organisational, operational and management skills of the smallholders towards sustainable production*

<b>Case</b>	<b>Interviewee</b>	<b>Excerpt</b>
Case 1	Interviewee 01	“The cooperative actively keeps contact and checks with us and provides us with the relevant information and documents, instead of being reminded as before”
Case 1	Interviewee 02	“[...] for traceability, one member represents the cooperative to buy and re-distribute to all members”
Case 1	Interviewee 04	“We must build up our organisation and management skills, so that we can maintain sustainable value chain contracts with the company”
Case 2	Interviewee 08	“They manage their production better than before. Currently, they meet up more regularly, discussing and sharing better”
Case 2	Interviewee 11	“Since value chain contract signed, we are more united and careful in our practice, we see our real benefits”
Case 2	Interviewee 10	“To maintain ASC, we must be capable enough to manage ourselves, we are on the way to upgrade that”

The above analysis provides insightful explanation of the role of the local lead firms enhancing the smallholders’ organisational, operational and management skills (1b1), however, the degree in the skill enhancement of each value chain case is different. To discuss the different degree of these skill enhancements of the smallholders, responding the interviewer’s question of scoring the cooperative’s skills, the local agency leader indicated that: *“Based on the scoring of 10, I score the changes from 6 to 9 for the cooperative 2 who started its organisation as collaborative group since 2012 and then legally upgraded to the cooperative early 2017. I score the changes from 1 to 9.5 for the cooperative 1 who started its organisation as the legal cooperative end of 2016”* (interview 13). The interviewee 13 also added that: *“The cooperative 1 is a real good cooperative model, not only in the Bac lieu province but also for whole Mekong River Delta area”*.

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<sup>20</sup> The company(ies) or processing company(ies) in all excerpts and tables refer to the local lead firm(s)

The organisational, operational and management skills of the smallholders towards sustainable production is enhanced by the influencing role of the local lead firms and by their promotion of horizontal linkages among the smallholder that is described in the next analysis.

*1b2. The role of the local lead firms promoting horizontal linkages among the smallholders*

In addition to the enhancing of organisation and management of production, the establishment of horizontal linkages is a key challenge for scaling-up and alerting the smallholders about their rights, especially in GVCs (Ha Tran et al., 2013) that is caused by the promoting role of the local lead firms (1b2). To have better horizontal linkages, the smallholders must establish (i) open discussion and participatory mechanism for benefit sharing, and transparency or (ii) promote shared-benefits and voice for transparency in the cooperatives (see Table 2). These affect the horizontal linkages among the smallholders that is the key concern of the local lead firms who want to work with the smallholders, as the interviewees shared: “*the most difficult to sustain linkage with the company<sup>21</sup> is production yield which firstly is based on our horizontal linkages in the cooperative*” (interview 10) and “*we create and take favourable conditions to build up our cooperative, so that we have stronger voice with the company. We no longer act as individual smallholders*” (interview 03). See table 8 for further evidence of the local lead firms’ role in promoting horizontal linkage.

*Table 8: Further evidence of the role of the local lead firms promoting horizontal linkage among the smallholders*

<b>Case</b>	<b>Interviewee</b>	<b>Excerpt</b>
Case 1	Interviewee 01	“The cooperative organises regular meetings when I joined, I encouraged them to share their feedbacks and claims”
Case 1	Interviewee 03	“We share a common view and do not think our individual benefits. We trust each other. [...]. I create an open platform for people to share their feedbacks that I receive as a positive learning method”
Case 2	Interviewee 08	“We observe that the cooperative discusses and shares information publicly and transparently, they no longer hide where to buy good materials”
Case 2	Interviewee 12	“Some members had disagreements in implementing value chain contract, but our cooperative discusses and agrees that we can take a step back to sustain the relationship”

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<sup>21</sup> The company(ies) or processing company(ies) in all excerpts and tables refer to the local lead firm(s)

The supporting role of the local lead firms in (1b1) production organisation and management skills and (1b2) horizontal linkages among the smallholders are the coupling codes that ensure the changes in production organisation and management models (1b) to supply qualified products to the local lead firms under the value chain contracts. Moreover, these themes also promote innovative production management models in generating alternative income as the director of the Cooperative 1 described: *“I create more jobs and alternative income for our members and some idle community women through producing value-added products as our local specialities. I firstly organise small-scale production for more effective. I will see how to scale it up later”* (interview 03).

The production organisation and management models are also affected by other skills and capacities of the smallholders such as investment, cost and benefit analysis, contract implementation and monitoring which are explored further, in the next sessions, how the smallholders are influenced or motivated by the local lead firms’ strategies and activities.

#### **4.1.2 The role of the local lead firms on the improvement of the smallholders' investment capability for sustainable production**

Investment capabilities refer to skills required before and during the investment (Lall,1992; Morrison, Pietrobelli & Rabellotti, 2008). Those capabilities need to identify, prepare, obtain technology as well as to assess the feasibility and profitability of the transactions, negotiation concerning input-output contracts.

The Vietnam shrimp local value chain governance is a mixed of relational and captive governance, in which the local lead firms play the important role in codification of the transactions and investment through the value chain contracts with the smallholders. The smallholders directly receive the local lead firms’ financial support for production management and investment in consultancy and auditing services and at the same time, indirectly gain improved investment capability through implementing cost and benefits analysis and investment plan in sustainable production (2a).

In what follows, I analysed the role of the local lead firms supporting the smallholder’s capabilities to implement cost and benefit analysis and investment plan for their sustainable production and in the compliance with the market standards, as well as how the local lead firms

influence the contracting and negotiation and the improvement of cost and benefit analysis skills for their own investment plan.

## 2a. The role of the local lead firms implementing cost & benefit analysis and investment plan in sustainable production

The sustainable production in agricultural value chains requires not only practice but also investment in new technologies and farming techniques. It also requires skills in building transactions and negotiation with other value chain actors based on the effective cost analysis and management. Through their structuring and implementation of value chain contracts, the local lead firms firstly influence the smallholders' contracting and negotiation skills (2a1) and secondly influence the smallholders' cost and benefits analytical skills (2a2).

### *2a1. The role of the local lead firms in contract and negotiation skills by the smallholders*

The role of the local lead firms in contracting and negotiation skills by the smallholders (2a1) is expressed through (i) the analysis of the value chain contracts' implementation and (ii) the discussion and analysis of investment under the value chain contracts (see table 2). The director of the Cooperative 1 (interviewee 03) shared how the cooperative 1 assessed the local lead firm' transactions before signing the value chain contract for practising ASC standards with them: *"The company<sup>22</sup> invests financially and technically in our sustainable production, thus, it is much better and brings more benefits for our people"*. The interviewee 03 confirmed: *"There have been many disagreements before contract signing and challenges during implementation, however, we have discussed and reached to equal agreement. One party should not care of their own benefit, if so, it might not last long"*. Meanwhile, the director of Cooperative 2 (interviewee 09) showed the concerns about the feasibility of the contract provisions in meeting the cooperative's benefits: *"The company paid for our annual production management cost. However, we used most of that cost to correct the compliance errors, and we are discussing for additional support, because as estimated, that might not be enough"*. Table 9 below provides addition excerpt to further the role of the local lead firms in contracting and negotiation skills of the smallholders.

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<sup>22</sup> The company(ies) or processing company(ies) in all excerpts and tables refer to the local lead firm(s)



Table 9: Additional excerpt of the role of the local lead firms in contracting and negotiation skills

Case	Interviewee	Excerpt
Case 1	Interviewee 05	“Using probiotics is even cheaper and moreover, better for environment, human and animals” “We see our real benefits because we sell for higher price and buy collectively with lower cost. So far it is relatively stable”
Case 1	Interviewee 06	“If we signed the value chain contract but sold to the other, we would breach the contract. Similarly, if the company squeezed the price and paid us less than committed”
Case 1	Interviewee 03	“We must discuss with the input suppliers what we need to comply with the required standards, otherwise we find others. [...] we gradually persuade them but also put more pressure sometimes, so they must follow”
Case 2	Interviewee 08	“We introduce input suppliers for them, firstly they check and compare with others on the pricing and payment term, then decide to contract”
Case 2	Interviewee 09	“The company has not yet formed a sourcing team to directly collect our shrimp at site but through an agency. We find it difficult, so we plan to discuss further with the company”
Case 2	Interviewee 12	“The company introduces a good hatchery supplier whom we investigate and contract with, it seems good so far, however, I think we need to discuss more on price and investment”

Regarding skills in investment and contracting analysis, the smallholders have changed their traditional cash-based to cashless transactions in order to increase transparency among the smallholders and promote risks management, the leader of one of the local agencies justified that: *“the influencing role of local lead firm 1 to the cooperative 1’s bank transactions is a huge achievement in the general context of Vietnam where most of smallholders or legal cooperatives are using cash in all transactions including the cooperative 2”* (interview 13).

In addition to the contracting and negotiation skills of the smallholders, the local lead firms also influence the improvement of cost and benefit analysis skill of the smallholders (2a2), which is presented in the following section.

#### *2a2. The role of the local lead firms improving cost & benefit analysis skill of the smallholders*

The role of the local lead firms improving the smallholders’ skill in conducting cost-benefit analysis (2a2) is achieved through (i) the balancing between reduced production cost and increased positive environmental impacts and (ii) the improved analytical skills for market

access and investment plan (see table 2). The Table 10 below provides evidence for the role of the local lead firms improving cost and benefits analysis skills of the smallholders.

Table 10<sup>23</sup>: Evidence for the role of the local lead firms improving cost and benefit analysis skills

Case	Interviewee	Excerpt
Case 1	Interviewee 05	“Since application of sustainable standard, I dig a big cesspool to treat the rubbish instead of throwing to the river as before. Also, since then, I make a silo for shrimp shells, dry and grind them to feed chicken or use as natural fertiliser for crops”
Case 1	Interviewee 03	“I invest in water-recycle system, so that I can apply ASC standard better. When I use probiotics to treat the water, I can also reduce cost”
Case 2	Interviewee 11	“The company commits to pay us 3-5 percent higher than market price for ASC certified shrimp, but of course we have to invest in improving our production for compliance. Thus, we need to agree what is the market price?”
Case 2	Interviewee 12	“We are now doing with limited efforts though we can invest in more advanced technology. We want to see how the company implements their contract and investment”.

In a general assessment on the investment capability of one of the cooperatives, the leaders of local agencies emphasize the transformation of the cooperative 1 that: *“The cooperative 1 has improved its entrepreneurship by producing value-added products and expanding markets to neighbouring provinces. They are issuing their own legal invoice of the local lead firm’s material sourcing, which only few cooperatives national wide of Vietnam are able to”* (interviewee 13) and *“They are managing well their newly established shrimp collection and logistics service for the local lead firm, which no other cooperative can do right now”* (interviewee 14).

The above assessments further explore the difference in improvement degree of the two cooperatives in the two different local value chains led by two local firms. The degree of support and interactions of the local lead firms changes and motivates the changes of the smallholders’ investment and operation.

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<sup>23</sup> The company(ies) or processing company(ies) in all excerpts and tables refer to the local lead firm(s)

### **4.1.3 The local lead firms' impact on the transformation of the smallholders' linkage capability in sustainable production**

In line with the arguments by Lall (1992) and Morrison, Pietrobelli and Rabellotti, (2008) about the vertical dimension of capabilities as a key element for assessment of the nature of the mechanisms to build capabilities, the thesis explores the impact of the local lead firms in the transformation of the smallholders' linkage capabilities in sustainable production through (3a) the smallholders implement and maintain value chain partnerships at vertical dimension.

#### **3a. The local lead firms' role in implementing and maintaining value chain partnerships for sustainable production**

Linkages are considered to be a key part of technological capabilities (Lall, 1992) reducing high transaction costs in inefficient markets (Morrison, Pietrobelli & Rabellotti, 2008). In relation with sustainable agriculture value chains, the role of the local lead firms in implementing and maintaining value chain partnerships for sustainable production (3a) is expressed through (3a1) the implementation of the transactions with input suppliers for product traceability and (3a2) the monitoring and evaluation of value chain and business strategy of the local lead firms.

##### *3a1. The role of the local lead firms on the capabilities of the smallholders to implement transactions with input suppliers for product traceability*

Input suppliers, one of the key value chain partners for shrimp sustainable production, are not engaged in the local value chain contracts. Smallholders are interacting with them through simple purchase transactions (market governance). However, under the value chain contracts between the local lead firms and the smallholders, the implementation of the transactions with input suppliers for traceability (3a1) is gained through (i) the smallholders' stronger power relation, voice and negotiation skills and (ii) the local lead firms' guidance and promotion of the interactive partnerships for the application of traceability in the compliance with the sustainable standards (see Table 2). The sustainability managers of both local lead firms shared that: *“As required, input suppliers must supply products with the originals of certificate, bill of health which they have never done as traditional norms with smallholders.*

*We have to directly discuss and request for those documents” (interview 01) and “We consult our smallholders to add the traceability provisions into input material contracts and guide them what and how to collect the required documents” (interview 07). The additional excerpts from our interviewees on the role of the local lead firms on the capabilities of the smallholders are shown in the Table 11 below.*

*Table 11<sup>24</sup>: Additional evidence of the role of the local lead firms on the smallholders’ capabilities to implement transactions with input suppliers for product traceability*

<b>Case</b>	<b>Interviewee</b>	<b>Excerpt</b>
Case 1	Interviewee 04	“We choose input suppliers ourselves but consult with the company if their products qualify with the company's requirements. They recommend a list of certified suppliers and guide us the required documents for traceability documents”
Case 1	Interviewee 03	“The company contacts to our selected input suppliers, discuss on the requirements of our value chain contract. Whenever the input suppliers organise technology transfers for us, the company always joins and actively share their opinions”
Case 1	Interviewee 01	“Though we only contact input suppliers in term of required documents, we affect to their behaviour change. Now, after every material delivery, they pro-actively contact me to check if I require any further documents”
Case 1	Interviewee 02	“They call me whenever difficulties arise. If they request my support to discuss with input suppliers for traceability documents, I will”
Case 2	Interviewee 07	“We always remind and supervise if they collect documents per required and consult whenever they get difficulties in dealing with suppliers”
Case 2	Interviewee 08	“When someone from the cooperative called me to check if that supplier’s products are qualified, I consulted that smallholder to check list of requirements and test sample. We always support them to test sample of new suppliers”
Case 2	Interviewee 09	“They recommend some suppliers who are far from our sites. We decide to buy from local agencies but follow their guidance on ASC compliance”
Case 2	Interviewee 11	“They request traceability documents and guide us how to work with input suppliers to get that. We discuss how to deal with suppliers who hardly handle us the documents. They directly contact and work with our suppliers too”

<sup>24</sup> The company(ies) or processing company(ies) in all excerpts and tables refer to the local lead firm(s)

Not only transactions with input suppliers are implemented, but also the monitoring and evaluation of value chain and business strategy are conducted by the smallholders through the influencing role of the local lead firms. From which the smallholders can analyse long-term commitments and adjust their practice towards sustainability.

### *3a2. The role of the local lead firms in the smallholders' capabilities to monitor and evaluate value chain and business strategy*

The smallholders' capabilities in monitoring and evaluating of the value chain and business strategy (3a2) is illustrated through (i) the evaluation and monitoring of the cooperation with the local lead firms, their social welfare policies and business ethics and (ii) the assessment of the realization of the local lead firm's commitments (see Table 2).

The director of the Cooperative 1 indicated how to find out the local lead firm that the cooperative wants to work with. Interviewee 03 shared personal observations, investigation of many other companies' value chains and at the same time, justified the contract implementation of the local lead firm 1 before signing value chain contract. The interviewee 03 said: *"I observed and investigated many value chain contracts, visited many companies and found out why those value chains break, how those companies implement their commitments, what are their conflicts, solutions. I know which company to trust and I trust the director of the company"<sup>25</sup>* (interview 03). The interviewee 03 also added why the trust was given to the director of local lead firm 1: *"The company's staffs, during their support for our ASC practice, share about employee' welfare and leaderships and I observe what the company is contributing to the provincial communities so I think that is the person who will surely share with smallholders' benefits like us and I should trust that person"* (interview 03).

In contrast, the director of the Cooperative 2 shares the concerns about the company's long-term vision in working with the cooperative: *"To be honest, we do not fully believe in what the company committed, however, we are examining how well they will implement their commitments"* (interview 09). The interviewee 09 explained why the trust has not been given: *"The company commits to pay higher price, but its sourcing is still through its local agency with similar market price, we do not know exactly if that price is fixed by the company or the agency itself"* and stated the expectation of the cooperative: *"We expect that we can work directly with the leader of the company, so that our voice is heard correctly. If communication*

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<sup>25</sup> The company(ies) or processing company(ies) in all excerpts and tables refer to the local lead firm(s)

is through its staffs, our voice might be differently interpreted, the complexity of the discussions or conflicts might not be justified”. See Table 12 for additional evidence.

Table 12: Evidence of the role of the local lead firms to the smallholders’ capabilities to monitor and evaluate value chain and business strategy

Case	Interviewee	Excerpt
Case 1	Interviewee 04	“We learnt how the company is doing business and operating through the factory visits. The company presented and oriented us on sustainable production. We also observed how the company’s staffs work with us and studied from external sources”
Case 1	Interviewee 05	“The support team regularly visits and encourages us to practice and maintain our compliance. Whenever we get trouble, they always come and help us to solve it in a very supportive manner”. “The director is the reliable person; the company’s staffs praise the social heart of their leader who cares for their welfare and helps the poor. That justifies our trust in that person”
Case 1	Interviewee 06	The company is prestige. The director and staffs visit us regularly and support us well.
Case 2	Interviewee 10	“We expect that the company should maintain the practice and compliance of sustainable production with us. I personally feel that they are doing countermeasure when focusing more on certification instead of in-depth practice”
Case 2	Interviewee 11	“For full accomplishment of sustainable production, the company must close up the value chain linkages, so that they need to invest more in our production” “I feel not confident about the leadership of the company since it changed its new leader board”
Case 2	Interviewee 12	“When one member noticed the company of their harvest, the company refused to buy for the reason of not having prepared tools and means of logistics. That is breach of the contract”.

The interviewee 14 also justified the smallholders’ capabilities to monitor and evaluate the value chains strategy that “*The cooperative 1 has seen real benefits in the favourable value chain contract with the company<sup>26</sup>, so they manage to arrange shrimp collection service for the company. Thus, their collaboration is much closer than the cooperative 2*”, from which the role of the local lead firms is recognised. The interviewee 14 added that: “*the company 1 tends to expand its markets, so it focuses more on its long-term strategy of building sustainable*

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<sup>26</sup> The company(ies) or processing company(ies) in all excerpts and tables refer to the local lead firm(s)

*sourcing. Meanwhile, the company 2 tends to shrink its business scale, therefore it puts less efforts in the collaboration with the cooperative”.*

The findings above show that the local lead firms play an important role in the transformation of the smallholders’ technological capabilities in all term of production, investment and linkages. Through this transformation, the smallholders upgrade their production towards sustainability in all economic, social and environmental aspects.

## 4.2 Cross-case comparison

The thesis pointed out the commonalities in the role of the local lead firms in the (i) enhanced knowledge and accessibility to sustainable production and improved production processes and planning to meet the sustainable standards, (ii) improved skills in organisation, operation and management as well as horizontal linkage for the production towards sustainability, (iii) enhanced skills in contract and negotiation, cost and benefits analysis for investment in sustainable production, and (iv) empowered partnerships with input suppliers and improved skills of monitoring and evaluation. The analysis shows that under the influencing role of the local lead firms, the smallholders’ technological capabilities has transformed towards more sustainable shrimp production.

However, the thesis also addressed the discrepancies in the degree of transformation of the smallholders’ in two different value chain cases under the degree of the influencing role of the local lead firms. The differences in the two cases’ sustainable production practices, investment and transactions with the local lead firms and input suppliers were described in the analysis above and justified by the interviewee 13 that *“the cooperative 1 has better transformation than the cooperative 2 who had better start”*. Those comes from the difference in business development strategies which could be summarized in the following excerpts: *“we acknowledged that we must be empowered to exchange with what the company<sup>27</sup> invested”* (interview 03) and *“we are now doing with limited efforts”* (interview 12).

The thesis analysed the discussions and classified the degree of the influencing role of the local lead firms in every themes of technological capabilities of the smallholders for each value chain case on scale of 1 to 3 (see Table 13). The Figure 6 provides the definitions of the degree of influencing role of the local lead firms in 1-weak; 2-medium and 3-high levels.

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<sup>27</sup> The company(ies) or processing company(ies) in all excerpts and tables refer to the local lead firm(s)

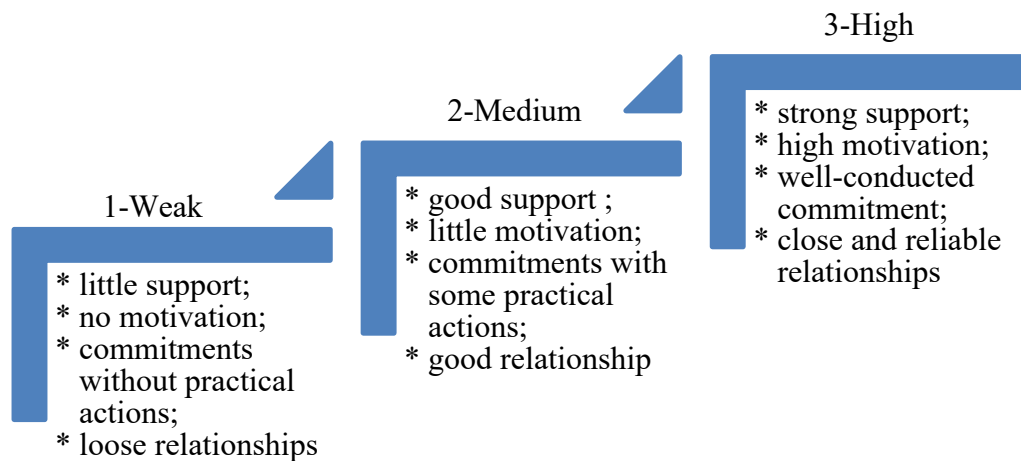


Figure 6: The scale of degree in the influencing role of the local lead firms

The table 13 below presents the classification of the degree of the influencing role of the local lead firm, in which ❶ stands for case 1 and ❷ stands for case 2:

Table 13: Scoring the influencing role of the local lead firms

Cross-case first-order codes	Scoring the influencing role of the local lead firms		
	1	2	3
	Weak influencing	Medium influencing	High influencing
1a1. The role of the local lead firms enhancing knowledge and access to sustainable production standards by the smallholders			❶ ❷
1a2. The role of the local lead firms improving production processes and plan of the smallholders towards sustainability		❷	❶
1b1. The role of the local lead firms enhancing organisational, operational and management skills of the smallholders towards sustainable production		❷	❶
1b2. The role of the local lead firms promoting horizontal linkages among the smallholders.		❷	❶
2a1. The role of the local lead firms in contract and negotiation skills by the smallholders	❷		❶
2a2. The role of the local lead firms improving cost & benefit analysis skill of the smallholders		❷	❶
3a1. The role of the local lead firms on the smallholders' capabilities to implement transactions with input suppliers for product traceability by the smallholders	❷		❶
3a2. The role of the local lead firms on the smallholders' capabilities to monitor and evaluate value chain and business strategy		❷	❶



In addition, the study also discussed the factors that led to these differences. The director of the Cooperative 1 confirmed the engagement in the company's value chain contract that *"I trust in the leader of the company"* (interview 03) which is shared by the other interviewees of the case 1. While the director of the Cooperative 2 worried about this engagement that *"I honestly do not trust them"* (interview 09), other interviewees of the case 2 also mentioned this disbelief. The social trust was mentioned in our interviews that could be an affecting factor to the influencing role of the local lead firms to the smallholders' transformation towards sustainability.

The two cases differentiate from each other through describing the local lead firms' business development policies as well as their leaderships. For example, the interviewees of case 1 recognised the local lead firm 1's social entrepreneurship related to employees' welfare and community contribution while the interviewees of case 2 showed their doubt about long-term business strategy of the local lead firm 2. At the same time, the interviewees from the local lead firms justified the discrepancies in leadership style that might affect the transformation of the smallholders' capabilities in the long run. The interviewee 01 of case 1 shared that: *"My director is the key person to start and accompany us in following up the collaboration with the cooperative 1"* while the interviewee 08 of case 2 said *"my director is concerned about the case and sometimes asks me how is going on with the certification of the cooperative 2"*.

Meanwhile, the interviewees of local agencies stated that *"I would say the company 1 collaborates with the smallholders more honestly, while the company 2 only cares for formalism in sustainable production"* (interviewee 14) when being asked about the willingness and long-term commitments in the sustainable production practice and *"the company 1 empowers its staffs, while the company 2 only assigns the tasks"* (interviewee 13) when being asked to clarify the varied leadership modes of the two cases that might foster the transformation of the smallholders' capabilities.

# 5 Discussion and conclusion

## 5.1 Discussion

The thesis aims to explore the role of the local lead firms in the transformation of the smallholders' technological capabilities towards sustainable agriculture production, as tier 1 suppliers of the international lead firms who govern GVCs by using GVC governance (Gereffi, Humphrey & Sturgeon, 2005) and technological capabilities framework (Lall, 1992, Morrison, Pietrobelli & Rabellotti, 2008) under the global principles of sustainable food and agriculture (FAO, 2014). It focuses on the production, investment and linkage capabilities in agriculture GVCs through the exploration of the Vietnam local shrimp value chains.

The results show that, the local lead firms play an important role in the transformation of the smallholders' technological capabilities in local value chains, and at the same time, play an intermediary role between the international lead firms and local suppliers. The local lead firms are the most competent suppliers who interpret and concretize the global markets' requirements into understandable languages and feasible practice for the smallholders. At the same time, the local lead firms' role recognition is to commit and provide support to the smallholders in the realisation of the transformation of local production towards sustainability. The efforts of the local lead firms in building sustained partnerships and influencing the smallholders are the key elements to transform the smallholders' business mindsets and practice their capabilities in production, investment and linkages that ensure their equal engagement in GVCs.

The findings of the thesis support the arguments of (Lee, Gereffi & Beauvais, 2012) who suggested the intermediary role of "local firms" on smallholders in agro-food GVCs towards sustainability, but the thesis clarifies the role of "local lead firms" in the transformation of the smallholders' technological capabilities. The local lead firms' role should be explicitly explored to ensure the local agriculture transformation towards sustainability of the developing countries through the transformation of the smallholders' technological capabilities.

Four prominent aspects emerged from my findings which contribute to advancing literature on GVC governance, technological capabilities in GVCs and sustainable food and in a developing country. Firstly, the thesis provides new insights into the role of the local lead

firms in the transformation of the smallholders' competencies (Gereffi, Humphrey & Sturgeon, 2005) and investigates in the ways in which learning mechanisms are established to build capacities for the smallholders (Lall, 1992; Morrison, Pietrobelli & Rabellotti, 2008). To the extent to which upgrading of technological capabilities influence the governance mechanisms, this thesis contributes to understand drivers of governance change.

Secondly, the study extends the discrepancies in degree of the influencing role of the local lead firms which leads to the differences in the degree of the smallholders' transformation in the two selected cases. This finding also supports the arguments of Morrison, Pietrobelli and Rabellotti (2008) on the vertical dimension of technological capabilities as well as different levels of complexity.

Further, the comparison of the two cases shows how "social trust" might formulate and foster the transformation of the smallholders' capabilities towards sustainable production, as illustrated in the case 1. The social trust, being considered as "social capital" is placed by the strong influencing role of the local lead firms. It is built during the partnerships of the local lead firms and the smallholders, which is the key factor for the success of the equal and transparent value chain partnerships. On the other hand, the social trust was not mentioned in the case 2, in which the smallholders are so reserved in applying sustainable production practice and lowers the transformation of technological capabilities towards sustainability.

Finally, the thesis also extends the inter-learning mechanism for the transformation of the smallholders' technological capabilities for developing countries (Lall, 1992; Morrison, Pietrobelli & Rabellotti, 2008) towards sustainable agriculture through fostering entrepreneurship of the smallholders. The entrepreneurial transformation of the cooperative, a common collective organisation form in agriculture production in developing countries, which strongly affects the smallholders' organisation and management skills, is the important factor to sustain their horizontal linkages, so that they can maintain their production towards sustainability.

## 5.2 Practical Implications

This study reinforces the GVC governance framework to the improvement of local suppliers' competencies and contribute to a more comprehensive understanding of how GVC governance in general and the local lead firms in particular affects the local transformation towards sustainability. In addition, the findings offer evidence of how the local lead firms

positively affect the evolution of GVCs in developing countries through interplays between the international lead firms in “buyer-driven chain” and the smallholders in “supply-driven chain”.

The study shows that the approach of technological capabilities of local suppliers through GVC governance is applicable and distinctive for sustainable production and compliance with the international standards of developing countries. Thus, studies in GVC governance and technological capabilities will be beneficial from this finding by understanding how the local lead firms influence the transformation of the smallholders’ capabilities and sustainable production as well as by evolution of learning mechanisms for the smallholders’ capabilities. Moreover, the thesis also discovers the evolution of the local lead firms’ capabilities through-out the supporting activities in GVCs that is in line with the suggestion of vertical linkage capabilities of Lall (1992) and Morrison, Pietrobelli and Rabellotti (2008).

Furthermore, the thesis offers recent findings on the transformation of Vietnam shrimp industry towards sustainability and compliance to global standards and how effective the value chain approach is as policy implication for Vietnam agriculture production.

### 5.3 Future Research

Future study should continue examining the role of the local lead firms in the transformation of the smallholders’ capabilities towards sustainable agriculture production by selecting cases from other provinces and agricultural value chains of Vietnam or from various shrimp European-exporting countries (such as Indonesia and Thailand) to evaluate differences and similarities. This study should determine specific factors that contribute to differences in the results, providing support for existing findings. Quantitative research should provide empirical investigations of the local lead firms to yield unbiased results that can be generalised to larger populations.

In addition, another future research should explore further the effects of the social trust to “facilitate the coordination and cooperation for mutual benefits” (Putnam, 1995, p. 67). Under the social and geographical proximity context of agricultural production countries, social trust, as one of the social capital sources, might foster the transformation of local sustainable production. And thus, this research should contribute to examine the relation of social capital with income inequalities, thus extending to investigate other dimensions of sustainability transformations beyond the ecological requirements discussed in this thesis (Ferragina, 2010; Xiaoying Qi, 2017).

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# Appendix 1: Sustainable Food and Agriculture Principles (FAO, 2014)

## 5 Principles of Sustainable Food and Agriculture

**Principle 1:** Improving efficiency in the use of resources is crucial to sustainable agriculture

**Principle 2:** Sustainability requires direct action to conserve, protect and enhance natural resources

**Principle 3:** Agriculture that fails to protect and improve rural livelihoods, equity and social well-being is unsustainable

**Principle 4:** Enhanced resilience of people, communities and ecosystems is key to sustainable agriculture

**Principle 5:** Sustainable food and agriculture requires responsible and effective governance mechanism

## 5 Principles of Sustainable Food and Agriculture in Aquaculture

- **Principle 1:** Improving efficiency in the use of resources is crucial to sustainable agriculture
  1. Aquafeed management
  2. Integrated multi-trophic aquaculture
  3. Robust biosecurity/aquatic animal health
  4. Use of best management practices (BMPs), good aquaculture practices (GAPs), codes
  5. Domestication of aquaculture species
  6. Aquaculture certification for animal health and welfare, and food safety
  7. Implementing the Ecosystem Approach to Aquaculture (EAA)
  
- **Principle 2:** Sustainability requires direct action to conserve, protect and enhance natural resources
  1. Conserve aquatic genetic resources
  2. Promote aquaculture certification for environmental protection
  3. Ensure biosecurity: pathogens, escapees, use of veterinary drugs, invasive species, biodiversity
  4. Use integrated aquaculture-agriculture systems
  5. Implementing the Ecosystem Approach to Aquaculture (EAA)

- **Principle 3:** Agriculture that fails to protect and improve rural livelihoods, equity and social well-being is unsustainable
  1. Aquaculture business-model, especially for small-scale producers
  2. Aquaculture certification including gender considerations
  3. Cooperative marketing
  4. Mainstream aquaculture into rural development processes
  5. Technological, trade, institutional, infrastructure, capacity development, investment and other support services
  6. Aquaculture and nutrition programmes
  7. Implementing the Ecosystem Approach to Aquaculture (EAA)
  
- **Principle 4:** Enhanced resilience of people, communities and ecosystems is key to sustainable agriculture
  1. Assess risks in aquaculture (pathogens, food safety, ecological, environmental (including climate change), genetic, social and financial)
  2. Set early warning, preparedness, surveillance systems and contingency plans for aquatic emergencies
  3. Implementing the Ecosystem Approach to Aquaculture (EAA)
  
- **Principle 5:** Sustainable food and agriculture requires responsible and effective governance mechanisms
  1. Compliance with international treaties, standards, agreements on sustainable aquaculture, animal health, food safety
  2. Voluntary adoption of BMPs, GAPs
  3. Contribution and impact assessments
  4. Implementing the Ecosystem Approach to Aquaculture (EAA)

# Appendix 2: Interview guideline & questions



LUND UNIVERSITY  
School of Economics and Management

## **Master thesis:**

### **The role of local lead firms in the transformation of smallholders' technological capabilities: A case study of Vietnam shrimp production**

#### **Introduction**

The thesis aims to explore the influencing role of the local lead firms in the transformation of smallholders' technological capabilities.

The key research question will be addressed:

*How do the local lead firms influence the transformation of the smallholders' technological capabilities?*

The thesis focuses on the role of the local lead firms to the smallholders' capabilities in production, investment and linkage. It employs an inductive qualitative case study method, using two shrimp value chain cases in the Bac lieu province of Vietnam.

This interview guideline and questionnaire is a part of a master thesis that aims to study and explore influencing role of local lead-firms in the transformation of the smallholders' technological capabilities towards sustainability. The interview guideline and questionnaire help the researcher focus on the key above research question and sub-questions, and at the same time maintain the interview principles of qualitative research case study methods to unbiased the data and observe better the response.

## *Interview guideline & questions*

Guideline: Before interview, the interviewer must notice the interviewees the anonymous principles, recording, some technical risks or potential breaks/drops due to internet connection in order to make sure the interviewees be aware of and ready to be recalled. Then the interviewer notices of the structure of the interviews

### INTERVIEWER

All information gathered during this interview will be treated confidentially, i.e. it will not be possible for anyone to identify your cooperative/firm. Moreover, no individual cooperative/firm or organization will be mentioned in any publications based on these interviews. If such a need should arise, we will ask for your permission.

### INTERVIEWER

The interview is divided into three main blocks. part is background information and general introduction of the cooperative/local lead firms. *The first* concerns with the GVC partnerships and sustainable production, in which the value chain contracting, and sustainable practising process will be explored, including ASC standards. *The second* part deals with how the local lead firms play role in the supporting and fostering the sustainable production and compliance to the required standards. *The third* is the assessment on the transformation of the smallholders' technological capabilities in sustainable production, from which assessing the degrees in the role of the local lead firms to this transformation.

Guideline: The interviewer starts the interview by getting brief introduction of the interviewees

Interviewer: \_\_\_\_\_

Date of the interview: \_\_\_\_\_

Name of the cooperative/local lead firm: \_\_\_\_\_

Address: \_\_\_\_\_

The Cooperative/local lead firm number (anonymous) \_\_\_\_\_

Name of respondent: \_\_\_\_\_

Title: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

## INTERVIEWER

We will start asking some questions and recording our interviews. If you are not comfortable with any questions and do not want to respond, please notice me and we can move forward to other questions. During the interview, I may mix some questions in different parts and/or have more following up questions to elaborate your response.

### **Part 1: Global value chain linkages and the compliance to sustainable practice**

*Guideline:* this part focus on the current status of the local value chains that the cooperative/local lead firms are engaged, the partnerships and the shrimp production towards sustainability. Part 1 explores the value chain contracts signed between the cooperative and the local lead firms, provisions and how each party are implementing the contracts. It also explores the ASC (Aquaculture Stewardship Council) standards required by the European markets, from which to examine how the smallholders understand and how they access to it.

#### *Questions:*

1. Could you introduce briefly about your current value chain partnerships and how to build that partnerships?
2. Could you tell me a little bit about the European market's requirements on quality and sustainable practice compliance that your value chain involves?
3. How is your current value chain contract performance and partnerships?
4. Are there any challenges in practising and compliance general sustainable production?
5. Could you tell me on the challenges in terms of implementing the value chain contract?
6. How do you apply sustainable production practice/standards?
7. How do you know about ASC? How do you start with ASC?
8. How the local lead firms deal with ASC?
9. Could you elaborate on the challenges of compliance to ASC standards. Example?
10. What technological capabilities that you think/need in order to apply and practice the sustainable production and this ASC standards?
11. Do you know who are your international buyers? Or do you hear anything about them from the local lead firm (for cooperative). How often do they interact?
12. Do you get any supports from these international buyers for your production or compliance to their required standards (in all aspects)?

## **Part 2: The role of the local lead firms to upgrading capabilities for sustainable development of the smallholders/the cooperative**

Guideline: this part focus on how the local lead firms are supporting and implementing the activities to foster the sustainable production practices by the smallholders. This part explores the key activities/supports and how they perform their support and what are the key factors to affects the support of the local lead firms.

### Questions:

1. Do you get/provide any supports to the cooperative/smallholders from the local lead firms to practice sustainable production? Please elaborate what kinds of supports? Or activities related to support?
2. What is your specific assessment (the degrees of the support) on those support/activities given by the local lead firms to your cooperative (for every specific support/activity: e.g. training, value chain structuring, investment, sourcing services, logistics, networking...?)
3. How do you think the local lead firm implements value chain contracts for sustainable production practices (*To smallholders/ cooperatives*)?  
How do you think you are implementing value chain contracts for sustainable production practices to support the cooperative? (*To local lead firms*)
4. How do you think the local lead firm play their role in fostering sustainable production practices in your cooperative? (*To smallholders/ cooperatives*)  
How do you think you are playing your role in fostering sustainable production practices and compliance to standards by the cooperative? (*To local lead firms*)
5. What are the key factors for the local lead firms to function their role in fostering sustainable production (capabilities, size, policies, human resources, finance, awareness or willingness, trust and relationships...)?
6. How the local lead firm performs indirectly and directly to support you in sustainable production practices (example), compliance to the standards (example), investment analysis (transaction, negotiation, cost & benefit analysis) and linkages with other value chain actors (traceability, transaction, monitoring...)?
7. Do you set up any mechanism for information sharing, transferring, feedback and negotiation with the local lead firms?
8. How the local lead firms contact and support you in sustainable production practice? Do the firms' staffs work with you or do the leader of the firms work with you?



9. What is the willingness and efforts by the local lead firms in supporting the smallholders?
10. How long time the local lead firm responds to the smallholders' needs?
11. How quality of the local lead firms meets the smallholders' needs.
12. How do you solve the conflicts or disagreements (if any)? And who from the local lead firm to involve in these discrepancies,
13. How do you think about the local lead firms' capabilities (knowledge, leadership, management) in supporting the smallholders?
14. How the local lead firm facilitates the coordination, network, and other value chain actors in fostering the sustainable production.
15. What do you know about the local lead firm' business strategy or ethics? And why they are performing so (*to the smallholders*)
16. How the local lead firm works with supporting agencies to support the smallholders?
17. What if the local lead firms did not support the smallholders in sustainable production? What if they do not support in the future?
18. Are you satisfied with the support by the local lead firms? Why or why not?
19. What do you think the local lead firm should improve their performance in supporting you?
20. Do you think you will continue collaboration with the local lead firm? Why or why not

### **Part 3: Assessment on technological capabilities of the smallholder towards sustainability**

Guideline: this part focuses on the improvements or transformation of the smallholders' technological capabilities in sustainable production practices. Part 3 provides the good insights how the smallholders have changed their attitude, business mindsets and practices in order to comply with the required standards. This part explores the transformation in production, investment and linkages of the smallholders which are related to the support/activities given by the local leaf firms. Part 3 both examines the commonalities and discrepancies in the transformation of the smallholders and support given by the local lead firms, so that the thesis can make comparative analysis of the two cases.

Questions:

1. What and How do you improve your sustainable production and compliance to the standards? (Or how the smallholders improve their practice towards sustainability?)
2. What is the difference between before and after being supported by the local lead firms in

the sustainable production? What scoring before and after working with the local lead firms if you can have scoring of 10 grade?

3. How do you assess yourself/or how do you assess the performance of the smallholders in comply to ASC standards?
4. What are the key errors/mistakes that should be corrected? Why?
5. How do you/the smallholders improve their investment skills for sustainable production?
6. Do you invest in new technologies? Do you care for cost reduction? Why and how you reduce cost?
7. How do you discuss with the local lead firms to gain more benefits?
8. Do you make cost and benefit analysis before discussion with the local lead firms? Why and How?
9. Do you gain more benefits from your investment analysis? How higher do you gain?
10. How do you assess the contract conditions with the local lead firms? Are they good enough? Why or why not?
11. If you can renegotiate, what conditions do you want to change? Why?
12. Why do you think the local lead firms maintain or not maintain the contract commitments? (e.g.: the firms' policies, strategy, ethics, leadership.....?)
13. How do you work with the input suppliers to make sure traceability?
14. How you can influence them to change in order to meet your requirement?
15. How the local lead firms support you to work with input suppliers?
16. How do you manage to restructure your collective organisation and operation to meet the local lead firms' requirements?
17. How do you change your management in the cooperative for sustainable production practice? Why and what to change?
18. How you share information and improve the transparency in the cooperative? How do you know the smallholders agree and make the right application and practice for simultaneous performance?
19. What and how do you support the smallholders to manage their production for collective purchasing and selling?
20. What is key difference in your cooperative management?
21. Will you surely maintain or be able to maintain the improved capabilities without the local lead firms' support?
22. What are the capabilities you improve the best and what are the least? Why?
23. What are the key factors to foster or support you to improve the least capabilities?

24. Do you see any changes in capabilities of the local lead firms' staff during their working with you? Do you think co-evolution is good for both parties? Why?
25. Why do you believe in this local lead firm instead of another?
26. Do you expect the long-term relationship with the local lead firms? Why and How?
27. What do you think if the relationship will be long-term or short-term?
28. Do you know if other members of the cooperative agree to work and follow the local lead firm' guidance? Why or why not
29. Do you have any innovation in your production/business or any unique to tell us?
30. If you can say anything about the role of the local lead firms, what will you say?

INTERVIEWER

We have already asked most of our questions and if anything, I have not asked but you want to share, please share with us. If anything, missing during interviews or if our recording is not good enough due to technical problem, we would like to call you back to clarify some parts. Thank you and we hope that we can have more chance to explore more on this topic

Guideline: In addition to these above questions, some more exploratory one is used to interview the supporting agencies as external sources, so that the interviewer can justify the commonalities and discrepancies of the two value chain cases and make comparative analysis. The interview for the supporting agencies focuses on general assessments on both value chain cases based on the above questions and specific questions for the difference between two cases. At the same time, the interviewer also explores what are the key factors for those differences in the transformation of the smallholder as well as in the role of the local lead firms.

END OF GUIDELINE & QUESTIONNAIRE

# Appendix 3: Consent form



LUND UNIVERSITY  
School of Economics and Management

**Master thesis:**

**The role of local lead firms in the transformation of smallholders’ technological capabilities: A case study of Vietnam shrimp production**

Master Candidate: Ha Do Thuy

*Interview Consent Form.*

I have been given information about *The role of the local lead firms in the transformation of the smallholders’ technological capabilities: Case study of Vietnam shrimp production* and discussed the research project with *Ms. Ha Do Thuy* who is conducting this research as a part of a Master’s in Innovation and Global Sustainable Development supervised by Cristina Chaminade.

I understand that, if I consent to participate in this project, I will be asked to give the researcher a duration of approximately 60 minutes of my time to participate in the process.

I understand that the interview will be recorded, and I consent to record the interview. I also consent to transcribe and quote directly from the interview for the study purpose provided that my name is hidden or coded.

I understand that my participation in this research is voluntary, I am free to refuse to participate and I am free to withdraw from the research at any time without any reasons.

By signing below, I am indicating my consent to participate in the research as it has been described to me. I understand that the data collected from my participation will be used for thesis and journal publications, and I consent for it to be used in that manner.

Name: .....  
Email: .....  
Telephone: .....  
Signed: .....