Complex Social and Environmental Interactions within the Commodity Chain of Sericin Soap produced by Rural Sericulture Community Enterprises in Thailand

Paphaphit Wanasuk

Thesis submitted to the University of Nottingham for the degree of Doctor of Philosophy

September 2018

Abstract

Thailand is the first country in the world where the government supports sericulture (silk producing) communities in operating soapmaking businesses based on sericin—a protein isolated from silk wastewater—with the explicit goal of rural economic development. Despite government support (i.e. One Tambon One Product, or OTOP, and Small and Micro Community Enterprise, or SMCE, promotion schemes) and the ongoing expansion of technology transfer to rural communities, little is known regarding the geographies of sericin soap commodity chains, roles and impacts of chain actors, relationships and interdependence between chain actors, and commodity chain impacts. I fill these knowledge gaps and lay a framework for analysis of the environmental impacts of the cosmetics value chain as well as the potential of rural business development to empower female actors. Specifically, this study aims to explicate the complex socioeconomic, cultural, and environmental interactions within the commodity chain of sericin soap produced by rural sericulture community enterprises in Thailand. Adopting a *'Follow the Thing'* approach, it traces soaps from production in rural Thai communities to market and consumption and analyses the factors that come to light. A collective case study methodology was employed with four case studies to present the realities of the soap commodity system.

This research demonstrates that the soap commodity chain is characterised by practices and behaviours of chain actors, relationship between chain actors, environmental conditions, and government policies. This influences how each soap is produced, packaged, travelled, consumed, and disposed, leading to different socioenvironmental impacts. Hence, each soap value chain has its own distinct characteristics, processes, and impacts subject to its commodity system.

The findings reveal that none of the actors solely dominate or overpower the chain because the actions of community enterprises and government agencies tend to ameliorate exploitation and dominance while increasing fairness to both soapmakers and traders. This empowers rural citizens in general and to a large degree female and elderly female actors.

This research recommends *Follow the Thing* as an approach to investigate social and environmental interactions within and impacts of the commodity chain and use it as 'a political tool' to examine strengths and weaknesses of government agencies, including the effectiveness of government policies. In addition, this study suggests that Thai government agencies should increase the level and consistency of their cooperation and collaboration, so that these agencies can more effectively achieve their stated goals of fostering sustainable economic development in rural communities and empowering rural actors.

Keywords: Sericulture Community Enterprises, Sericin Soap, Follow the Thing, Ethical Trade, Environmental Conservation, Ethical Consumption, Thailand, SMCE, OTOP, Woman Empowerment, Rural Community Development

Acknowledgements

Firstly, it would have been impossible to complete my study in the UK in the past ten years without the scholarship from the Development and Promotion of Science and Technology organisation. I would like to thank them for putting their faith and trust in me who have embarked in this journey.

Secondly, I would like to thank the Institute of Asia and Pacific Studies which funded me to do fieldwork in Thailand.

Thirdly, I would like to thank my supervisors Prof. Michèle Clarke and Prof. Paul Nathanail, who provided me academic support and gave me freedom to study in areas of natural cosmetics and community development which I have been passionate about. They have trained me to become more critical and appreciate how fascinating the research world is. I thank them for their kindness, expertise, and motivation.

Fourthly, in relation to fieldwork, I would like to thank everyone who shared their insights and inspired me to complete this journey, starting from officials from the Queen Sirikit Department of Sericulture, Clinic Technology offices, the Biodiversity-based Economy and Development Organisation, Ministry of Science and Technology, and Sub-District Administrative Organisations; locals and leaders from Huaysai, Poethong Charoen, Nayaw-NaUdom and Chumtabong communities; and all stakeholders in this research. It has been a privilege to know everyone in this journey and received kindness and guidance from them. They really help me reflect what I want for my life and how I want to continue my journey after completing this degree.

Fifthly, I would like to thank the School of Geography at the University of Nottingham which provides me a great opportunity to be with kind and thoughtful officemates including other PhD students in the past four years, especially Prasujya, Alice, Will, Ben, Joe, Han, Roberto, Sarem, and Shan who I become close with. I manage to enjoy my time in Nottingham and overcome many obstacles because of their supports. Likewise, I would like to thank the staff in the School of Geography who allowed me to be part of their modules. I have learnt a lot from their classes and reflected what I could do better in my research.

I would like to thank my dad, mum, sisters, relatives, and friends who truly support and believe in me that I can accomplish my goal. They have been with me through ups and downs and pushed me through any hardship.

Lastly, I would like to dedicate this thesis to my grandpa and grandma who raised me up and encouraged me to face everything with positive attitudes. I am really sorry that I cannot finish this degree sooner before you went to heaven. I thank you for your unconditional love and support.

Paphaphit Wanasuk

September 2018

Table of Contents

LIST OF ABBREVIATIONS vii

CHAPTER 1-INTRODUCTION 1

1.1 Overview of the Impacts of the Sericin Soap Commodity Chain 1

1.2 Objectives 6

1.3 Justification of the Study 7

1.4 Thesis Structure 8

CHAPTER 2-THEORETICAL FRAMEWORK 10

2.1 Overview of Commodity Chain Approaches 10

2.2 The Follow the Thing Approach 14

2.3 Consumption 18

2.4 Summary 21

CHAPTER 3-SERICIN SOAP IN THAILAND: EXPLORING COMMODITY CHAIN IMPACTS 23

3.1 Silk Production: The Origin of Sericin Soap 23

3.1.1 Mulberry Cultivation 29

3.1.2 Silk Production 30

3.1.3 Soap Making 32

3.2 The Thai Silk Industry 35

3.3 Exploring Soap Value Chains 44

3.4 Soap Consumption in Thailand 49

3.5 Sericin Properties in Cosmetics 50

3.6 The Royal Thai Government's Political Support for the Soap Value Chain 51

3.7 Roles of Royal Thai Government Agencies in the Soap Commodity Chain 53

3.8 Investigating Impacts of Soap Value Chains in Thailand 60

3.8.1 Socio-Economic Impacts of the Soap Value Chains 60

3.8.2 Environmental Impacts of the Soap Value Chains 62

3.9 Summary 64

CHAPTER 4-RESEARCH METHODOLOGY 66

4.1 Philosophical Approach to the Study: A Pragmatic Worldview 66

4.2 Collective Case Study Methodology 66

4.2.1 Mixed Methods *73*
4.2.1.1 Pilot Tests 74
4.2.1.2 Participatory Rural Appraisal 75
4.2.1.3 Interviews 77
4.2.1.4 Observations 81
4.2.1.5 Questionnaires 82
4.3 Data Management 83
4.3.1 Transcription *83*
4.3.2 Translation *84*
4.4 Data Analysis 85
4.5 Reliability and Validity of the Study 87
4.5.1 Data Triangulation *89*
4.5.2 Participant Feedback *90*
4.5.3 Positionality and Reflexivity of the Researcher *90*
4.6 Research Constraints and Difficulties 93
4.7 Ethical Considerations and Risk Management 93
4.8 Summary 95
CHAPTER 5-CASE STUDIES 96
5.1 Overview of the Geography, Climate, Ethnicity, and Local Economies in Thailand 96
5.2 Exploring Regional Backgrounds of Thailand 100
5.2.1 Background of Northeast Region of Thailand *104*
5.2.1.1 Huaysai (HS) Sericulture Community Enterprise, Northeast Thailand 107
5.2.1.1.1 Geography of Huaysai Community 111
5.2.1.1.2 Socio-Economic Background of Huaysai Villagers 112
5.2.1.2 Nayaw-NaUdom (NN) Sericulture Community Enterprise, Northeast Thailand . 114
5.2.1.2.1 Geography of Nayaw and NaUdom Communities 116
5.2.1.2.2 Socio-Economic Background of Nayaw and NaUdom Villagers 117
5.2.2 Background of North Region of Thailand *118*
5.2.2.1. Poethong Charoen (PTC) Organic Agriculture Group, Northern Thailand 120
5.2.2.1.1 Geography of Poethong Charoen Community 123
5.2.2.1.2 Socio-Economic Background of Poethong Charoen Villagers 123
5.2.3 Background of Central Region of Thailand *125*
5.2.3.1 Chumtabong (CTB) Sericulture Community Enterprise, Central Thailand 126
5.2.3.1.1 Geography of Chumtabong Community 128
5.2.3.1.2 Socio-Economic Background of Chumtabong Villagers 129

5.3 Summary 130

CHAPTER 6-THE VALUE CHAIN 1: THE THAI GOVERNMENT AGENCIES 131

6.1 Roles and Impacts of the Queen Sirikit Department of Sericulture in the Soap Commodity Chain.....131

6.2 Roles and Impacts of the Thailand Institute of Nuclear Technology in the Soap Commodity Chain.....139

6.3 Relationship and Interdependence between Government Agencies in the Soap Commodity Chain.....143

6.4 Summary.....150

CHAPTER 7-THE VALUE CHAIN 2: SERICULTURE COMMUNITY ENTERPRISES AND ENTERPRISE MEMBERS 154

7.1 Roles and Impacts of Sericulture Community Enterprises 154

7.1.1 Management Practices of Community Enterprises.....154

7.1.2 Characteristics of Community Enterprise Members.....155

7.1.3 Government Support.....160

7.1.4 Operational Soapmaking Styles.....163

7.1.5 Obstacles Faced by Community Enterprise Members.....166

7.1.6 Profit-Sharing Schemes in Community Enterprises.....168

7.1.7 Contribution to Communities.....174

7.2 Following Soap Production 176

7.2.1 Socio-Economic Backgrounds of Enterprise Members 176

7.2.2 The Tale of Soap Production 183

7.2.3 Outputs of Soap Production.....199

7.3 Impacts of Soap Production 204

7.4 Summary.....206

CHAPTER 8-THE VALUE CHAIN 3: SELLING SOAPS - TRADERS, 'MIDDLEMEN' AND THE ROLE OF ENTERPRISE LEADERS.....209

8.1 Community Enterprise Traders 211

8.1.1 Community Enterprise Traders at Huaysai and Nayaw-NaUdom Communities 215

8.1.2 Community Enterprise Traders at Chumtabong Community.....219

8.1.3 Contributions to Communities.....223

8.1.4 Obstacles Faced by Community Enterprise Traders.....225

8.2 Private Traders 226
8.3 Government Agencies 230
8.4 Market Map of the Thai Soap Value Chain 242
8.5 Summary 243

CHAPTER 9-THE VALUE CHAIN 4: CONSUMERS 247
9.1 Socio-Economic Backgrounds of Sericin Soap Consumers....247
9.2 Socio-Economic Backgrounds of Non-Consumers of Sericin Soap 249
9.3 Following Soap Consumption....251
9.4 Impacts of Soap Consumption 261
9.5 Summary 267

CHAPTER 10-CONCLUSIONS 269
10.1 Introduction 269
Objective 1: To Characterise the Soap Commodity Chain, its Processes, and its Impacts....270
Objective 2: To Identify the Social Status, Identities, and Lifestyles of Chain Actors of the Soap Commodity Chains 271
Objective 3: To Assess Social and Economic Impacts of the Soap Commodity Chains on Sericulture Communities 276
Objective 4: To Explore the Environmental Impacts of Soap Production, Trade, and Consumption 278
10.2 Contributions to Theoretical Approaches 279
10.2.1 Employing the Follow the Thing Approach as a Political Tool to Evaluate the Government Performance....279
10.2.2 Applying the Follow the Thing Approach to the Cosmetics Industry....280
10.2.3 Adopting the Follow the Thing Approach to Explore Environmental Aspects of the Commodity Chain 280
10.2.4 Using the Follow the Thing Approach to Analyse the Geographies of Consumption in Both the West and the East....280
10.2.5 Exploring the Relevance and Uses of the Follow the Thing Approach in Community Development, Environmental Conservation, Ethical Trade, and Ethical Consumption 280
10.3 Recommendations for Policy Makers....281
10.3.1 Scaling Up Circular Economy Projects 281

10.3.2 Developing a Standard Sustainability Assessment Framework for Community Development Projects *282*

10.3.3 Educating the Public about Ethical Consumption *284*

10.3.4 Improving Basic Infrastructure *284*

10.3.5 Improving Adult Learning Capabilities *285*

10.3.6 Using Partnership Strategies to Reduce Dependency of Communities on Government *287*

10.4 Limitations of the Study 288

10.5 Future Research 288

References 290

Appendix 1: Questionnaire Form 335

Appendix 2: Interview Protocols 337

Appendix 2.1 Interview Questions for Mulberry Farmers 337

Appendix 2.2 Interview Questions for Silkworm Rearers 337

Appendix 2.3 Interview Questions for Silk Reelers 338

Appendix 2.4 Interview Questions for Silk Suppliers 338

Appendix 2.5 Interview Questions for Soapmakers 339

Appendix 2.6 Interview Questions for Enterprise Members Who Do Not Produce Soap 339

Appendix 2.7 Interview Questions for Distributors, Middlemen, Traders and Sellers of Soap 340

Appendix 2.8 Interview Questions for Soap Consumers 341

Appendix 2.9 Interview Questions for Non-Consumers of Sericin Soaps in the UK ..341

Appendix 2.10 Interview Questions for Leaders of Sericulture Community Enterprises 342

Appendix 2.11 Interview Questions for Local Community Leaders 343

Appendix 2.12 Interview Questions for Locals Who Live in the Community that Produce Soap and Carry Out Sericulture Activities 344

Appendix 2.13 Interview Questions for Municipal Officers Who are in Charge of Developing Communities 345

Appendix 2.14 Interview Questions for Government Agencies (QSDS, BEDO, TINT and CT) 345

Appendix 2.15 Interview Questions for Group Interviews with Enterprise Workers 346

Appendix 3: An Example of Translated Interview 348

Appendix 4: Socioeconomic Analysis of Enterprise Workers 349

Appendix 5 Schematic Maps of Sericulture Communities 350

Appendix 5.1 Schematic Map of Huaysai Community (not to scale) 350

Appendix 5.2 Schematic Map of Poethong Charoen Community (not to scale) 351

Appendix 5.3 Schematic Map of Chumtabong Community (not to scale) 352

Appendix 5.4 Schematic Map of Nayaw and NaUdom Communities (not to scale)..353

LIST OF ABBREVIATIONS

SMCE	Small and Micro Community Enterprise
OTOP	One Tambon One Product
QSDS	Queen Sirikit Department of Sericulture
QSSC	Queen Sirikit Sericulture Centre
BEDO	Biodiversity-based Economy and Development Organisation
MOST	Ministry of Science and Technology
CT	Clinic Technology office
TINT	Thailand Institute of Nuclear Technology
HS	Huaysai community enterprise
CTB	Chumtabong community enterprise
PTC	Poethong Charoen community enterprise
NN	Nayaw-NaUdom community enterprise
NRRU	Nakhon Ratchasima Rajabhat University
HTHP	High Temperature and High Pressure

CHAPTER 1-INTRODUCTION

This thesis focuses on understanding and analysing the production, trade and consumption of soap made from silk sericin wastewater as part of a Thai government scheme aimed at promoting economic development within silk producing communities in rural Thailand. A *Follow the Thing* approach (Cook, 2004; Cook and Harrison, 2007) has been adopted throughout and the research explores—through participant observation and interviews with actors and stakeholders—the network of connections and associations prevalent at various spaces throughout the soap commodity chain.

1.1 Overview of the Impacts of the Sericin Soap Commodity Chain

Although definitions vary from country to country (Vermeer, 2000; Blaschke, 2005), for the purposes of this thesis soap is considered a cosmetic. While much has been written about the cosmetics industry, little research has focused on the commodity chain from production to consumption (Lovett, 2004; Clark *et al.*, 2011). The connections, relationships and interdependencies between chain actors have thus far been largely ignored, and how chain actors affect each other and the commodity system itself has not been well understood. Rather, the majority of cosmetics research is in regard to marketing, business, and consumer behaviour (Bbenkele, 1986; Punpanishgul, 2002; Patwardhan, Flora and Gupta, 2010; Adithya, 2011; Sarma and Pratap, 2011; Mahalingam and Kumar, 2012; Thanisorn, Byaporn and Chanchai, 2012; Vasantha, Varatharaj and Shalini, 2013; Hemalatha, Antony and Sivanesan, 2014; Katiyar and Katiyar, 2014; Shanmugapriya and Sethuraman, 2014). However, the production and trade of natural cosmetics offer opportunities to address poverty alleviation, woman empowerment, rural economic development, and environmental conservation, providing financial and livelihood benefits within local communities which produce these products (Beckett, 2015). As Leslie and Reimer assert in their 1999 publication, the characteristics of commodity chains, which include production, consumption, distribution and regulation, are shaped by place and space. This means that each link in such a chain has distinct impacts on and interrelationships with other links, in terms of environment, community, geography, and sociocultural setting.

In Thailand, cosmetics are governed by the Cosmetic Act of C.E. 1992 and are described as products designed for use by 'rubbing, powdering, spraying, or otherwise applying to any part of the body to cleanse or beautify, including skin-care products but excluding ornament and clothing' (Thailand Law Forum, 2011, p. 1). As there is no universal definition of *natural cosmetics* (Duber-Smith *et al.*, 2012), this study defines a natural cosmetic as a product that contains only natural ingredients that are not synthetically derived from artificial chemicals.

Not only is Thailand a key Asian manufacturer of international cosmetic brands and the top cosmetics exporter in Southeast Asia, but it is also a regional source of natural ingredients for cosmetic products (NSTDA, 2014; ITA, 2018). Furthermore, the Thai government aims to position the country as the main organic hub in Southeast Asia, with a focus on the herbal and natural cosmetics industry (Garcia, Quaratesi and Sincharoen, 2011). Despite government encouragement and strong domestic production, little is known regarding how these cosmetic commodity chains affect stakeholders and their surroundings (ITA, 2018). In 2017, the size of the annual domestic market for personal hygiene products was 23.3 billion baht (more than 46 million pounds) (£1= THB50) (ITA, 2018).

Thailand (previously known as "Siam") is an upper-middle-income country that has changed from a subsistence agrarian society to an industrialised one (Jitsuchon, 1989; Kachondham, Winichagoon and Tontisirin, 1992) due to the support from the Thai government and the private sector (Jitsuchon, 1989; Falvey, 2000; Ekasingh *et al.*, 2008). Thailand also runs a social welfare system (Ekasingh *et al.*, 2008; World Bank, 2016), and is attempting to drive a green economy under its 12th National and Economic Development Plan (NESDP) (2017-2021) which is part of a 20-year national strategic plan (2017-2037) (PRD, 2016). Part of the development strategy aims at strengthening the economy by enhancing self-employment and creating more jobs through community enterprises (Harvie, 2003; Santitaweeroek, 2008; Natsuda *et al.*, 2012; Valeepitakdej and Wongsurawat, 2015). Key goals are to alleviate poverty—which is perceived as a rural phenomenon (UNDP, 2014; The World Bank, 2017)—and to reduce socioeconomic inequality between urban and rural areas (Natsuda *et al.*, 2012).

Respective governments in Thailand have set policy for the country and planned its economic future. These changes have historically been labelled in a numerical fashion. 'Thailand 1.0' focused on the country's agricultural activity, while 'Thailand 2.0' addressed its light industries. 'Thailand 3.0' shifted focus to heavy industry. While the country has experienced significant economic growth, it has faced certain obstacles. Inequality and unbalanced development across the nation have trapped the majority of Thai people in a middle income bracket (DRAEQA, 2016). Few people have been able to achieve higher incomes. To address this issue, the government has attempted to drive towards a value-based and innovation-driven economy. 'Thailand 4.0' is underpinned by a 20-year National Strategic Framework (2017-2037). This framework focuses on i) enhancing independency from the world economy by strengthening its internal economy; ii) producing innovative products; iii) targeting human capital and technology instead of physical capital; and iv) enhancing balanced development in four areas which are economic prosperity, social well-being, human wisdom, and environmental wellness (DRAEQA, 2016).

Although the goal of the Thailand 4.0 model is to manage the value chain effectively and resolve issues within the national economy, it is unclear how the policy will impact people. Little is known about its impact on commodity chains or the environment. Likewise, how chain actors' behaviours, relationships and interdependencies will change, and how such changes might impact levels of exploitation, inequality and dominance is also open to debate. In this respect, it is unclear whether 'Thailand 4.0' will benefit the parts of the country the policy focuses on or whether there will be any unwanted secondary effects.

This research focuses on the commodity chain of sericin soap (in both liquid and solid forms) produced in Thailand by small and micro sericulture community enterprises. Soap is classified under the cleansing category of cosmetics (Bremmer et al., 2006). The soap commodity chain is a by-product of silk production (i.e. mulberry cultivation, silkworm rearing, silk reeling, and silk degumming), with wastewater from silk degumming used in soapmaking.

Sericin or 'silk glue' is a type of protein which is removed from silk yarn or 'fibroin protein' during the degumming process as fibroin is retained to be

woven into silk textiles; sericin is normally discarded in wastewater (Aramwit, Siritientong and Srichana, 2012). Where it is adopted, soapmaking can be considered a waste management strategy for the sericulture (silk production) industry. Soaps are one of the cosmetic by-products made by sericulture community enterprises in Thailand; others are shampoos and skincare products (MOAC, no date; Neal, 2014; MOST, 2015). Most studies have focused on silk value chains but neglected the extended chain of silk-related products, which can likewise impact society and the environment (Brown, 1980; Agrifood Consulting International, 2005; EU-Thailand Small Projects Facility, 2007; Earth *et al.*, 2008; Siewsamdangdet et al., 2010).

Sericin is one of the constituents of insect silk (Gulrajani, 1988; Padamwar and Pawar, 2004). In Thailand, more than 90% of commercially-produced silk is derived from silkworms (EU-Thailand Small Projects Facility, 2007; Astudillo, Thalwitz and Vollrath, 2015). Silk is important for the economy, tradition, and culture, since 1861 government support has been in place to promote silkworm rearing and silk textile production (EU-Thailand Small Projects Facility, 2007; Earth et al., 2008; Siewsamdangdet et al., 2010). Production occurs across the country but sericulture and silk weaving are an integral part of the Northeast (known as 'Isan') economy of Thailand (Earth et al., 2008; Siewsamdangdet et al., 2010).

At present, Thailand is the sixth largest raw silk producer (about 1% of world production) and is ranked seventh in terms of raw silk imports (about 3% of world imports) (EU-Thailand Small Projects Facility, 2007). On this basis, it is possible to ascertain the amount of sericin-rich wastewater which would be discarded if not used in cosmetics production.

The technique of using silk wastewater in soapmaking was developed in 2010 through collaborative research between the Queen Sirikit Department of Sericulture (QSDS) and the Thailand Institute of Nuclear Technology (TINT) (TINT, 2010). Subsequently, other Thai agencies such as the Biodiversity-Based Economy and Development Organisation (BEDO) and Clinic Technology offices (CT) delivered this knowledge and technology to sericulture community enterprises, and their business model has been replicated in other communities too. However, no studies have yet adequately surveyed the geographies of the communities which produce

soap in Thailand. This might be because these communities are supported by different government agencies at different parts of the value chain. As the agencies only work specific aspects the chain very little data has been collected to establish how they have impacted the various communities they have worked with (TINT, 2010; QSDS, 2013; Clinic Technology, 2014; Neal, 2014). In addition, the scale of the soap production is still relatively small compared to silk production, so the majority of research still focuses on the silk industry. As a result, little is understood about gender division of labour in soap production and trading, or how commodity chains impact local gendered livelihoods or actors' environments.

The Thai government is the first in the world to support soapmaking businesses in sericulture communities; the objectives are to increase incomes and provide jobs in rural areas (MOST, 2013, 2015a). Little is currently known about the geographies of soap commodity chains, the roles and impacts of chain actors, or the connections between production and consumption. Hence, this research focuses on the small and micro community enterprise (SMCE) sector because it is legally supported by the Thai government (MOAC 2005). While there has been considerable research into major industries and national and multinational corporations, there has been little investigation into the roles and impacts of community-based enterprises and individual cosmetic producers, or their production capabilities, knowledge, and scalability, (Lovett, 2004; Clark *et al.*, 2011; Drost, Wijk and Vellema, 2012; Veiga and Zacareli, 2014).

This sector is subject to the 2005 SMCE Promotion Act which enables government agencies to support this sector with business training, knowledge enhancement, technology transfer, marketing support, and funding (MOAC, 2005; Valeepitakdej and Wongsurawat, 2015). The aim of the SMCE scheme is to alleviate both poverty and socioeconomic inequality through promotion of grassroots entrepreneurial activities (Harvie, 2003; Santitaweeroek, 2008; Natsuda *et al.*, 2012; Valeepitakdej and Wongsurawat, 2015). The 2005 SMCE Promotion Act defines an SMCE as a community enterprise which is governed by people who are in the same areas to develop products or provide services to generate profits and sustain themselves, their families, and their local communities (MOAC 2005). Under this Act, an SMCE must: (i) involve at least seven families; (ii) aim to

generate income to sustain itself and to benefit community members; and (iii) satisfy specified legal and moral standards (DOAE 2005).

This research adopts a collective case study methodology to examine the commodity chains of soap produced by small and micro sericulture community enterprises in Thailand. It investigates Huaysai enterprise in Nakhon Ratchasima province (Northeast Thailand), Poethong Charoen enterprise in Chiang Mai province (North Thailand), Chumtabong enterprise in Nakhon Sawan province (Central Thailand), and Nayaw-NaUdom enterprise in Buriram province (Northeast Thailand). They were selected to have a broad geographical coverage (therefore limiting the influence of local factors) and fairly represent the rural enterprise soap commodity chain in Thailand.

Another important point that must be addressed in this research is that although there is a wealth of environmental impact assessments based on various theoretical approaches, environmental factors are largely overlooked in commodity chain analysis (Morris and Therivel, 2001; de Groot, Wilson and Boumans, 2002; MEA, 2003; Haines-Young and Potschin, 2009; Potschin and Haines-Young, 2011). Most commodity chain research focuses on the production, distribution, and consumption of particular items, reflecting issues of inequality, exploitation, and dominance that impact chain actors at different scales and levels in the industry. They tend to focus on global inequality, social divisions, social justice, political economy, international trade, politics of ethical trade, critical citizenship, participatory democracy of stakeholders in the chain, and organisational networks (Hopkins and Wallerstein, 1986; Porter, 1990; Gereffi, 1994b; Gereffi and Korzeniewicz, 1994; Leslie and Reimer, 1999; Raikes, Friis Jensen and Ponte, 2000; Gereffi *et al.*, 2001; Cook, 2004; Cook *et al.*, 2007; Hartwick, 2015). In order to address the lack of due consideration of environmental factors in the context of commodity chains, this research employs a *Follow the Thing* approach, exploring the sociocultural and contextual impacts of the soap commodity chain.

1.2 Objectives

This research aims to explicate the complex social and environmental interactions within the commodity chain of sericin soap produced by rural sericulture community enterprises in Thailand.

The objectives are:

1) To characterise the soap commodity chain, its processes, and its impacts.
2) To identify the social status, identities, and lifestyles of chain actors of the soap commodity chains.
3) To assess social and economic impacts of the soap commodity chains on sericulture communities.
4) To explore the environmental impacts of soap production, trade, and consumption.

1.3 Justification of the Study

Commodity fetishism covers the exploitative relationship of both people and environment along the commodity chain, obscuring social, environmental, and geographical relations of commodity production through consumption (Marx, 1976; Hudson and Hudson, 2003; Goss, 2005; Taussig, 2010). The *Follow the Thing* approach (see Chapter2) enables the research to unveil the commodity fetish from soap producing communities to consumption sites (Cook, 2004, 2006), although the present scope does not go beyond purchase to study actual consumption. However, it does begin to indicate potential environmental impacts of soap consumption that are derived from soap packaging. This study is unique not only in that it engages the geography of consumption (like other *Follow the Thing* studies, see for example Cook, 2004; Cook and Harrison, 2007; Yeh and Lama, 2013; Ugoh, 2017) but also in that it encompasses the non-consumption geography which can likewise influence the soap commodity chain.

This research focuses on consumers in Thailand, which is an upper middle-income country, and non-consumers in the UK, which is a high-income country. This research thus contributes to the literature by looking at consumption patterns in both the Global North and Global South. This differentiates this research from other commodity chain studies, which tend to focus on a single side of the geopolitical economic divide (Cook, 2004; Cook and Harrison, 2007; Gregson *et al.*, 2010; Yeh and Lama, 2013; Ugoh, 2017).

1.4 Thesis Structure

This thesis is divided into 10 chapters. **Chapter 1** provides a contextual background of this research. It introduces the cosmetics industry in Thailand, sericin soap production projects led by Thai government agencies, and commodity chain analysis which is used to examine the soap commodity chain (see Chapter 2). It then points out research gaps which led to the formulation of the aim and objectives of the study. It goes on to justify the scope of this research.

Chapter 2 presents an overview of commodity chain approaches and explains why a *Follow the Thing* approach was adopted to provide a theoretical framework to track the soap commodity chain. The chapter also reviews geographies of consumption in relation to the commodity system.

Chapter 3 reviews the literature related to sericin soap production in Thailand, particularly in relation to its chain impacts. As sericin is derived from silk, it considers silk production and the Thai silk industry. The chapter also covers a range of issues including soap value chains, soap consumption in Thailand, and sericin properties in cosmetics. It also looks into the Royal Thai government's political support for and its roles in the soap value chain. It goes on to address the socioeconomic and environmental impacts of soap value chains in Thailand.

Chapter 4 outlines the philosophical approach that underpins this study, the research methodology and methods adopted for this study. It also addresses how this research managed and analysed data and how the reliability and validity of the study were established. It also considers research constraints and difficulties, ethical considerations, and how the research managed risk.

Chapter 5 provides an overview of the geography, climate, ethnicity and local economies in Thailand. In addition, it also covers the history of the selected sericulture community enterprises, including backgrounds of community members.

Chapters 6-9 discuss the roles and impacts of upstream, midstream and downstream soap commodity chain actors. They also address the significance of the research findings in relation to the wider literature.

Chapter 6 presents the roles and impacts of upstream soap value chain actors including the Thai government agencies that incentivise soap production. These agencies include the Queen Sirikit Department of Sericulture (QSDS), the Thailand Institute of Nuclear Technology (TINT), the Biodiversity-based Economy and Development Organisation (QSDS) and Clinic Technology offices (CT). The chapter considers the roles and impacts of QSDS and TINT, which mainly intervene in soap production. It goes on to address the roles and impacts of BEDO and CT, two organisations that primarily operate as traders and engage in both midstream and upstream activities (as detailed in Chapter 8). Furthermore, this chapter also presents the relationship and interdependence of these four government agencies in the soap commodity system.

Chapter 7 demonstrates the roles and impacts of other upstream soap value chain actors - sericulture community enterprises and enterprise members.

Chapter 8 illustrates the roles and impacts of midstream soap value chain actors including community enterprise traders and private traders. It also considers the activities of BEDO and CT which also operate in the midstream. In addition, it also provides a market map that depicts the Thai soap value chain.

Chapter 9 presents the roles and impacts of the Thai consumers that represent downstream value chain actors. It also demonstrates the roles and impacts of non-consumers in Nottingham, the United Kingdom (who do not purchase sericin soap).

Chapter 10 demonstrates this study's conclusions by stating how it achieved the research objectives and how it contributed to theoretical approaches. Recommendations for policy makers are also given alongside the limitations of the study. Suggestions for future research are also outlined.

CHAPTER 2-THEORETICAL FRAMEWORK

This chapter presents an overview of commodity chain approaches, how the *Follow the Thing* approach was chosen as the main theoretical framework of this research, and how consumption is viewed in the commodity system.

2.1 Overview of Commodity Chain Approaches

Various approaches have been developed to analyse commodity chains, from local to global scales. They allow us to explore issues emerging from both consumption and production, including political economy, moral economy, trade ethics, and ethical consumption. These approaches include *the global commodity chain, system of provision, commodity circuits, commodity networks, and Follow the Thing*. However, each approach deals with knowledge and information in different ways, resulting in different debates and actions to resolve the issues, thus, impacts of individual approaches can be different, depending on the aim of the study (Barrett, Browne and Ilbery, 2004).

By using commodity chain analysis, the relationship between people, places, and commodities are assessed in terms of the dynamics of the production and consumption connection (Hughes and Reimer, 2004). All connections in the chain are determined by power relationships, enabling issues of dependency, exploitation, and dominance to be explored across the chain (Harvey, 1990; Gereffi, 1994b; Gereffi and Korzeniewicz, 1994).

The idea of commodity chain analysis originated from Hopkins and Wallerstein (1977) and the concept is based on the world systems theory which traces back the inputs in processing commodities along the chain. This theoretical approach incorporates a worldwide division of labour and presents the unequal returns to these activities which create a stratified world-system (Bair, 2014).

The mainstream *Global Commodity Chain (GCC)* approach proposed by Gereffi & Korzeniewicz (1994) analyses global production and consumption dynamics but focuses more on the organisational scope of transnational production through economic agents such as suppliers, factories, traders, and retailers (Gereffi, 1994b, 1994a). Unfortunately, this approach largely

ignores the roles and impacts of consumers and instead focuses on input-output structures, the territory covered, governance structures, and institutional frameworks (Gereffi, 1994a, 2014; Gereffi and Korzeniewicz, 1994; Gereffi *et al.*, 2001; Neilson, 2014). Firms are the main unit of analysis (Hartwick, 2015), and this approach assumes that people in the same organisations will experience the same things; it neglects differences between individuals who have different socioeconomic backgrounds and cultures.

Gereffi *et al.* (2001) review other approaches to analyse the global value chain. *The Global Commodity Chain* concept has been used interchangeably with *Global Production Networks* (GPNs) and *Global Value Chains* (GVCs) since the early 2000s (Gereffi *et al.*, 2001; Gereffi, Humphrey and Sturgeon, 2005; Bair, 2009; Gereffi, 2014; Neilson, 2014). GCC, GVC and GPN differentiate themselves from each other by emphasising certain nuanced aspects which are governance, value of the activities, and corporations acting as network flagships, respectively (Gereffi and Korzeniewicz, 1994; Borrus, Ernst and Haggard, 2000; Gereffi *et al.*, 2001; Bair, 2009).

Other terminology is also used in the *global value chain* analysis, such as *value systems, production networks, the French filière approach, and value networks*. These approaches commonly look at global inequalities, divisions in the chain and organisational network (Porter, 1990; Raikes, Friis Jensen and Ponte, 2000; Gereffi *et al.*, 2001). Similar to GCC, these approaches still largely neglect roles and impacts of consumers in the chain and mainly focus on the various functions, impacts, and governance of production. Besides, the global commodity chain approaches have failed to look at cultural affluence of localities and individual actors because they focus more on globalisation and the relations between firms (Cook, 2006).

While a number of studies address issues such as exploitation and dominance in the global commodity chain, little attention has been paid to the role of gender. There is also an absence of study into how women perform or are exploited in relation to their roles within the chain. Likewise, whereas women might not be seen to play a dominant role in business globally, they play an important role within their households. Again, studies in the area have failed to consider such issues (Salzinger, 2003; Bair, 2009; Dunaway, 2014).

The role of gender in the international political economy is seldom addressed (Bedford and Rai, 2010) though Dunaway (2013, 2014) fills this gap by addressing the role social reproduction plays in production and by emphasising women's work through a *Global Commodity Chain* approach. Dunaway (2014) highlights the exploitation of female labour in global production and points out that women in the Global South represent the majority of the waged labour force in areas such as agriculture. They also dominate the service jobs which support the global production supply chain. In addition, women generate significant amounts of income from the informal sector. Often this is used to support household-based farms and businesses that are traditionally led by males.

Dunaway found that women dominate lower-paid occupations in the labour market. Such occupations offer poor work conditions and few opportunities for advancement. However, her work does not discuss the value chain conditions that empower women and enable them to overcome exploitation. To fill this gap in the literature, this study explores such issues in relation to the soap value chain.

Commodity chain approaches mainly focus on the vertical dimension of the chain but neglect horizontal aspects relating to place and space, such as class, ethnicity, and gender (Arce and Marsden, 1993; Leslie and Reimer, 1999; Dunaway, 2013, 2014). Barrett et al. (2004) and Leslie and Reimer (1999) point out that such approaches generally disregard issues of exploitation in retailing and consumption. In addition, commodity chain analysis has been critiqued for its linearity which neglects the complexity of the commodity system (Bair, 2008). To fill this gap in the literature, *a system of provision* was introduced by Fine (1994) to capture 'a more balanced treatment of the relationship between production and consumption' (Leslie and Reimer, 1999. p. 405). Consequently, both vertical and horizontal dimensions are determined by connecting production, distribution, marketing, and consumption, with more focus on consumer behaviour and material cultures (Fine and Leopold, 1993; Fine, 1994).

Despite this, the *system of provision* approach is critiqued for not fully capturing the complexity of consumption practices and for treating consumption as an outcome. Besides, the *system of provision* approach still undermines the connections between production and consumption (Leslie

and Reimer, 1999; Lockie and Kitto, 2000). Hughes and Reimer (2004) argue that *global commodity chain* and *system of provision* mainly concentrate on economic effects of production and unveil economic processes in the production line. But these theoretical frameworks neglect cultural, geographical, and socioeconomic nature of methodologies (ibid) and as a result, some scholars have shifted their focus from commodity chains towards *commodity circuits* and *networks* (Bair, 2008).

The *commodity circuit* approach attempts to explore the lives of commodities in relation to their surroundings and emphasises the cultural aspects in production, circulation, and consumption (Cook and Crang, 1996; Jackson and Taylor, 1996; Jackson, 1999; Hughes, 2000; Hughes and Reimer, 2004). This approach is set within a broader literature of commodity cultures (Hughes, 2000). The *commodity circuit* approach uses both cultural and geographical knowledge to inform its process of displacement along the commodity circuit, showing meanings attached to commodities at different stages of the circuit and revealing how these meanings are altered across different phases of their circulation (Crang, 1996; Jackson, 1999; Hughes, 2000; Hughes and Reimer, 2004).

The *commodity circuit* approach is different from the *commodity chain* approach because there is a notion of no beginning or ending in the system. It rather presents a dense web of interaction between commodities, sites, and goods as they travel through different processes (Cook and Crang, 1996). Thus, it presents how the geographical knowledge of commodity systems has been shaped or reshaped in the circuit (Hartwick, 2015).

Leslie and Reimer, (1999, p. 406) state that 'the commodity circuits both construct and are reconstructed by consumer knowledge'. This thus supports Cook and Crang's 1996 study which notes that production is consumer-driven and that producers are also consumers. This all contrasts with commodity chain analysis, which tends to emphasise one side over another. Nonetheless, the *commodity circuit* approach is critiqued for disregarding the concept of a chain and ideas of consumer resistance and activism (Leslie and Reimer, 1999).

The *commodity circuit* approach has been criticised for neglecting the importance of power and political economy, which were previously

highlighted in commodity chain analysis, by overstressing the role of consumers (Jackson, 1999; Barrett, Browne and Ilbery, 2004). Thus, the exploitation issues are ignored (Leslie & Reimer 1999).

Next, the *commodity networks* approach was proposed, in order to properly address the relationships between production and consumption through different kinds of nodes (people, firms, states, places, and organisations) within the network (Dicken *et al.*, 2001). This approach is based on the actor-network theory (Hughes and Reimer, 2004). This helps to reflect the pattern of 'webs of interdependence' which exists between actors (Powell and Smith-Doerr, 1994; Thrift and Olds, 1996). Other agents which support the exchange relationship between chain actors are also highlighted in the network (Hughes, 2000). There is also emphasis on how agencies are driven by both humans and non-humans and thus material objects are likewise empowered to cause transformation within the network (Latour, 1990; Juska and Busch, 1994; Busch and Juska, 1997; Murdoch, 1997). Sources of power and sites of exploitation can be determined through their interdependence (Leslie and Reimer, 1999), reflecting both vertical and horizontal dimensions of commodity movement (Whatmore and Thorne, 1997; Murdoch, 2000).

2.2 The Follow the Thing Approach

Anthropologist Arjun Appadurai first coined the phrase 'Follow the Thing' (FTT) in 1986. Appadurai (1986) uses *Follow the Thing* to unveil the social lives and histories of commodities. This approach has been influenced by Harvey (1990) who argued for the need to get behind the veil of commodities which consumers purchase.

Follow the Thing has been developed based on debates about commodity fetishism which refers to the negligence of social, environmental, and geographical relations of commodity production and the inclination of people to view the product of someone's labour in terms of relationships between things (Marx, 1976; Hudson and Hudson, 2003; Goss, 2005; Taussig, 2010). Commodity fetishism covers the exploitative relationship of both people and environment via the market exchange and marketing activities (Brooks and Bryant, 2013). Arguably, society seems to be controlled by objects over people and the environment (Paterson, 2013).

Follow the Thing is used to demonstrate the connections between production and consumption through actors, processes, places, relationship, cultures, and communities, in order to more adequately present the complexity of reality which was earlier ignored (Cook and Crang, 1996; Cook, 2004, 2006; Cook and Harrison, 2007). This approach can be regarded as a way to demonstrate commodity biographies that depict cultural, economic, political, social, and environmental aspects embedded in commodities and commodification (Appadurai, 1986; Kopytoff, 1986; Cook, 2004; Hughes and Reimer, 2004; Gregson *et al.*, 2010; Yeh and Lama, 2013; Saguin, 2014; Turner, 2015). As a result, this helps to reveal issues of dominance, poverty, and exploitation hidden in the chain at the personal level.

A *Follow the Thing* approach presents a wide range of perspectives and thoughts of chain actors (e.g. suppliers, producers, traders, middlemen, and consumers) by explaining why and how actors do things in certain ways, what impacts their activities, and how they respond to challenges from their internal and external pressures (Cook, 2004; Cook *et al.*, 2007). Consequently, this makes Cohen's statement come alive - "[all commodities] contain stories encompassing geography and time, supply and demand, raw materials and market forces, and people. People with names and toes and sores and wages and fancies and parents and memories" (Cohen, 1997, pp. 13–14).

Follow the Thing has been used to focus on defetishising fruit and food commodities which are produced from the Global South and consumed in the Global North (Cook, 2004, 2006; Cook and Harrison, 2007). Cook's style of ethnographic storytelling, like Cohen's 1997 work, allows one to empathise the story of each chain actor. Accordingly, Cook's work has helped to expand debates around social justice, political economy of the chain, international trade, politics of ethical trade, critical citizenship, and participatory democracy of stakeholders, particularly in the food industry (Cook, 2004; Cook *et al.*, 2007). *Follow the Thing* therefore allows researchers to integrate various theories to work together in a study (Cook, 2006). Furthermore, *Follow the Thing* has been used to trace commodities such as caterpillar fungus in Tibet, and has allowed researchers to address geographies of inequalities and political and moral economies in the commodity chain (Yeh and Lama, 2013). Despite this, issues of ethical consumption are not explicitly discussed in *Follow the Thing* studies, as the

majority still focuses on ethical trade and production (Cook, 2004; Harrison, 2006; Cook and Harrison, 2007; Yeh and Lama, 2013).

Like other commodity chain approaches, the *Follow the Thing* approach is typically used to trace complete commodities such as foods and clothes produced in Global South countries and sold in the Western consumer market. This implies that western consumption patterns become standard for universal consumers and consumption; this neglects consumers in the Global South, who have their own consumer and market cultures (Gregson *et al.*, 2010; Ugoh, 2017).

Follow the Thing studies rarely follow how commodities are built or produced from individual parts before they are traded (Gregson *et al.*, 2010; Herod *et al.*, 2013); most of their research focus on stabilised commodities. To extend the application of *Follow the Thing* approach, Gregson *et al.* trace the recycling of rubbish ships from Asia into household furniture sold in Bangladesh. This contrasts with other *Follow the Thing* studies that follow a commodity from developed to less developed countries as well as concentrating on the back end of the value chain.

Gregson et al. (2010, p. 853) argue that rubbish value is 'a function of their materialities and their ability to multiply and mutate' highlighting how the value of rubbish from one sector can be enhanced, modified, and revalued in another sector (Gregson et al., 2010; Herod et al., 2013). Their work focuses on any activity beyond the initial consumer (Gregson et al. 2010) and social and physical death of things in material cultures (Colloredo-Mansfeld, 2003; Dant, 2006).

This research described in this thesis has taken a similar approach to Gregson *et al.*'s study by following commodity down as well as up the value chain. It traces the source of sericin protein contained in the wastewater released from sericulture activities in communities in Thailand. Likewise, it also follows how this sericin is recycled to make soap, which is used, sold or traded to its consumption site.

The gendered nature of the commodity chain is largely overlooked in commodity chain analysis. Similarly, the *Follow the Thing* approach has rarely been used to examine the role of gender in relation to labour,

livelihood and development in the commodity system (Cook, 2004; Cook and Harrison, 2007; Yeh and Lama, 2013). Although both Ugoh's 2017 study (which focuses on postharvest loss in Nigeria's orange value chain) and Evans' 2018 study (which addresses laundry habits in the UK's household space) fill this research gap by using the *Follow the Thing* approach in this fashion, they had limited scopes in terms of the commodities and services they explored. This research substantiates the literature by presenting the gender roles of sericin soap chain actors. Whereas Nigeria might be regarded as a low-income country, and the UK a higher-income country, this research adds to the literature by considering the natural cosmetics sector in Thailand, an upper-middle income country.

Hartwick (2015) argues that commodity chain analysis neglects the natural environment at the production and is only used to reveal the social reproduction and political economy of the chain through the relationship between chain actors. Studies have rarely focused on environmental aspects which can influence chain actors' behaviours and attitudes, affect other people's well-being, and shape the characteristics of the chains (Hughes and Reimer, 2004). Hence, most commodity chain approaches have missed the connection with political ecology because there is no comprehensive combination of politics, consumption, culture, labour, and nature together in the chain (Peet and Watts, 1996). This research fills this gap in the literature by addressing environmental aspects which are fundamental to the commodity chain and evaluate impacts of the chain on communities and the environment.

Although cosmetics are everyday goods associated with various stakeholders and geographical settings, commodity chain research including other theoretical approaches rarely focus on this type of commodity (Lovett, 2004; Clark *et al.*, 2011; Drost, Wijk and Vellema, 2012; Veiga and Zacareli, 2014). Examples of cosmetic research includes: Lovett (2004) applies the global value chain approach to examine supply chain constraints of shea nuts in West Africa; Drost et al. (2012) uses theory of change to evaluate partnership strategies in shea value chains in Burkina Faso in West Africa; Veiga & Zacareli (2014) apply Common Pool Resources to determine the impact of partnership in terms of socioeconomic development and environmental sustainability on stakeholders and communities that manage Brazilian Rainforest Products in Brazil; and Clark et al. (2011) use a value

chain analysis to promote sustainability of alpha-Bisabolol which is a natural component of the Candeia tree in Brazil. To fill this gap in the literature, this research applies the *Follow the Thing* approach to trace sericin soap produced by sericulture community enterprises in Thailand. This is done to reveal their social reproduction, power relationships within the chain, and their socioenvironmental impacts on communities. Community development, environmental conservation, ethical consumption and ethical trade issues in the chain are also explored.

2.3 Consumption

Rather than viewing consumption as a consequence of production, many studies focus on how consumption socially, economically, and symbolically connects people and things together at various geographical locations in space and time (Warde, 1992; Crewe and Lowe, 1995; Goss, 2005; Fletcher, 2006; Mansvelt, 2014). These works argue that the value of commodities is formed through consumption which fulfils people's needs or pleasure (Marx, 1976; Jackson, 1993; Mansvelt, 2005, 2014). Since consumers are overwhelmed by branding, advertising, and marketing that try to convince them to believe something that may not be true (Goss, 2005; Hannigan, 2007; Vaccaro and Beltran, 2007; Mansvelt, 2010), consumers tend to neglect the social and environmental issues that are the ethical features of the commodity across cultures (Belk, Devinney and Eckhardt, 2005).

Consumption is central to understanding critical environmental politics because it connects people and nature directly and indirectly (Brooks and Bryant, 2013). To understand the consumption impacts on the chain, Hartwick (2015) notes that commodity chain analysis can be used to see the effects of consumption on labour and the environment. Likewise, Hartwick (1998) argues that horizontal analysis of commodities at the point of consumption helps to enhance awareness of vertical linkages to producers. Similarly, Mansvelt (2010) presents how gender, sexuality, race, age, and socio-economic status intersect with consumption practice.

Many authors regard consumption as a way to demonstrate the social status of consumers in the society (Bourdieu, 1984; McCracken, 1988; Goss, 2005), to communicate their identities (McCracken, 1988; Goss, 2005; Noble, 2008) through their preferences (Mansvelt, 2014), and to shape the culture and relationship itself (Gregson and Crewe, 2003). Likewise, Goss

(2005) and Mansvelt (2014) also link consumption with self-actualisation and social reproduction which relate to people's lifestyles.

Social reproduction refers to how people live and the direction in which societies are reproduced over time; it reproduces configurations that form consumption, production and exchange (Mansvelt, 2014). Social reproduction also corresponds to the function and symbolic effects of commodities which influence consumers to consume in order to reflect socially constructed meanings through social status and cultural implications (Gottdiener, 1995).

A number of elements contribute to social reproduction. These include financial, cultural, human and social capital. Each helps to determine people's status and power in social stratification (Bourdieu, 1984; Doob, 2013) and therefore contributes to social inequality. Social inequality refers to how individuals have different levels of access to valued resources (Doob, 2013).

Clearly, the transfer of financial capital to future generations reinforces social inequality. But in a similar fashion cultural, human and social capital transferred through family and education restrict social mobility. Each service to reinforce both symbolic power and symbolic violence in the society (Bourdieu, 1984; Doob, 2013).

Whether it be the sign value from appeal of the commodities or their smell, it can help to indicate identity of consumers (Corbett, 2006; Chatterjee, 2007). This thus supports Wiley's (2011) study which presents that a commodity has a different meaning in different places because individuals from different geographies may view it differently. Likewise, Curran & de Sherbinin (2004) argue that people's lifestyle is shaped by their values which make them buy things in a package. As such, sociality, spatiality and subjectivity aspects have been addressed in geographies of consumptions (Mansvelt, 2005, 2008, 2014) while obscuring an environmentality dimension which is more prevalent in sustainable development and ethical consumption research (Mather, 2015). To fill this gap in the literature, this research addresses these four dimensions of sociality, spatiality, subjectivity and environmentality in geographies of soap consumption.

Most consumers buy normal and luxury products because of their product features instead of their ethical features (Boulstridge and Carrigan, 2000; Carrigan and Attalla, 2001; Auger *et al.*, 2003; Belk, Devinney and Eckhardt, 2005; Davies, Lee and Ahonkhai, 2012). Auger et al. (2003) demonstrate that specific ethical features of the products affect certain types of individuals. They argue that ethical behaviour can be affected by the product nature and price and show that more price sensitive consumers are less ethically orientated with low price and low involvement product purchases like bath soap. Similarly, there is also no relationship between price sensitivity and ethical attribute sensitivity for high price, high involvement product purchase like athletic shoes either (Auger et al., 2003). Then, Davies et al. (2012) argue that consumers consider about ethics in luxury purchases significantly less than that in commoditised purchases because other factors (i.e. prestige, production satisfaction, self-image, and convenience) also come into play when purchasing this type of commodities.

The ethical disposition has little association with ethical decision-making, indicating an attitude-behaviour gap (Auger *et al.*, 2003; Vermeir and Verbeke, 2006). This is because anti-consumption behaviour is reactive to emotional rather than rational stimuli and subjective to locally relevant issues which engage them realistically (Eckhardt, Belk and Devinney, 2010). Nonetheless, consumers might alter their purchase patterns when they are provided with relevant ethical information in an effective way (Auger et al. 2003).

Most *Follow the Thing* studies focus on either domestic or foreign consumption of the commodity in relation to the production origins. As previously mentioned, they focus on Western consumption in relation to the production in the Global South (Cook, 2004; Cook, Crang and Thorpe, 2004; Gregson *et al.*, 2010) or both domestic consumption and production in the South (Ugoh 2017; Yeh & Lama 2013). However, no studies have combined both patterns in the same study as the spatiality aspect of consumption addresses how space and place are shaped and created through consumption (Goodman, Goodman and Redclift, 2012). But, it is necessary to understand differences and similarities of patterns of consumption in various geographies too. This study contributes to broader literature by adopting the *Follow the Thing* approach to trace both soap consumers in Thailand and non-consumers in Nottingham, United Kingdom, with different

cultural backgrounds to understand what drives their consumption behaviours. This contrasts to previous studies which have mainly focused on the consumer group of the commodities (Cook, 2004; Cook and Harrison, 2007; Yeh and Lama, 2013; Ugoh, 2017) but have not appreciated perspectives from non-consumers who likewise affect the chain.

One essential consideration that must not be overlooked is that consumption is not the end-point in the life cycle of a commodity (Foster, 2006; Gregson *et al.*, 2010; Lepawsky and Mather, 2011; Crang *et al.*, 2013) and this research treats the afterlives of commodities as equally important. *Follow the Thing* studies rarely go beyond post-consumption so impacts and values of wastes which may be released after consumption are still largely ignored (Gregson et al., 2010). This study fills this gap in the literature by following the environmental impacts of soap packaging and emphasising the value of wastes through the recycling process.

2.4 Summary

This chapter has reviewed commodity chains as a theoretical framework and examined their applications to evaluate the impacts of the chains on societies and the environment. As discussed in chapter 1, this research employs the Follow the Thing approach to examine the soap commodity chain. This is one of few studies which applies the commodity chain analysis to a natural cosmetic sector.

Follow the Thing combines the notable features of three commodity chain approaches (i.e. commodity circuits, commodity networks, and systems of provision) to trace both horizontal and vertical features of the commodity chains from production to consumption sites. The scope of this research is to follow the domestic movement of soap partially because the soap is produced and mainly consumed in Thailand and partially because no database of foreign consumers is available. Many studies tend to focus on either low or high income countries, not the country which is in the middle of that status like Thailand. Despite this, this research also extends the application of *Follow the Thing* by examining the non-consumer groups in Nottingham, the United Kingdom. The characteristics, identities and preferences of both consumers and non-consumers are also compared.

Adopting *Follow the Thing* helps to reveal backgrounds, identities, social status, and behaviours of chain actors, including their relationships, interdependencies, activities, obstacles, and challenges. As such, the whole system of the commodity chain is captured in order to expose issues of exploitation, dominance, and dependency across the chain. These are the underlying themes which all commodity chain approaches try to expose, regardless of how the commodities move from the Global South to Global North, vice versa, or even domestically.

The gendered nature of the commodity chain has been barely discussed. This research thus substantiates the literature by using the *Follow the Thing* approach to highlight the role of gender in labour, livelihoods and development in the soap commodity system which is rarely understood.

The gaps in the literature show that adequate discussion of how the commodity chain is linked with nature and impacts the environment is still lacking. This research fills this knowledge gap by employing the *Follow the Thing* approach to explicate socioenvironmental interactions within the commodity chain of soap produced by sericulture community enterprises in Thailand. In order to accomplish these goals, this research explores the entire soap value chain in Thailand, an upper middle-income country which is the geography that is barely investigated in the commodity chain research. This research thus contributes to broader literature by showing that *Follow the Thing* approach can be used in any geographical contexts. Likewise, its application can be used to not only improve the transparency and fairness of the value chain but also contribute to local communities and the environment.

CHAPTER 3-SERICIN SOAP IN THAILAND: EXPLORING COMMODITY CHAIN IMPACTS

This chapter reviews the literature related to silk production in relation to the origin of sericin soap, the Thai silk industry, soap value chains, soap consumption in Thailand and sericin properties in cosmetics. It also goes on to cover the Royal Thai government's political support for and its roles in the soap value chain. Then, it addresses the socioeconomic and environmental impacts of soap value chains in Thailand.

3.1 Silk Production: The Origin of Sericin Soap

Sericin soap is made from the sericin protein found in wastewater produced in the silk manufacturing process. A significant amount of research addresses the production of silk textiles and the silk value chain, but despite the recent expansion of sericin soapmaking activity in Thailand (MOAC, no date; Naenna, 1984; Haggblade and Ritchie, 1992; EU-Thailand Small Projects Facility, 2007; Neal, 2014; MOST, 2015), there has been no research into the production of soap as a by-product of silk production.

Mulberry silk is the most widely produced type of silk both in Thailand and globally (EU-Thailand Small Projects Facility, 2007; Babu, 2012; Astudillo, Thalwitz and Vollrath, 2015). Whereas non-mulberry silks are generated from wild silkworms (Eri (*Phylosamia ricini*), Tasar (*Antheraea mylitta*) and Muga (*Antheraea assama*) silkworms) which consume different types of leaves (Jolly *et al.*, 1979; Babu, 2012), mulberry silk is obtained from the cocoons of the mulberry silkworm, which feeds exclusively on the leaves of white mulberries, *Morus Alba* and *Morus Indica* (Hamamura, 1959; Zhisten, Mengcheng and Jianming, 1999; Babu, 2012; Astudillo, Thalwitz and Vollrath, 2015).

Mulberry cultivation (or *moriculture*), silkworm rearing (or *sericulture*), silk reeling, silk degumming, silk dyeing, and silk weaving are key components of the silk textile production chain (Fig. 3.1.) (Takeda, 2009; Babu, 2012; Astudillo, Thalwitz and Vollrath, 2015). As shown by Fig 3.2, silkworms are the larvae of the domestic Silk Moth (*Bombyx mori* L.). As the silkworms move out of the larval stage, they spin a silk casing (or 'cocoon') that

protects them as they transition into pupas and ultimately emerge as adult moths. These cocoons are used in the production of silk.



Figure 3.1 An overview of silk textile production starting from mulberry cultivation to finished silk textile products (EU-Thailand Small Projects Facility, 2007).

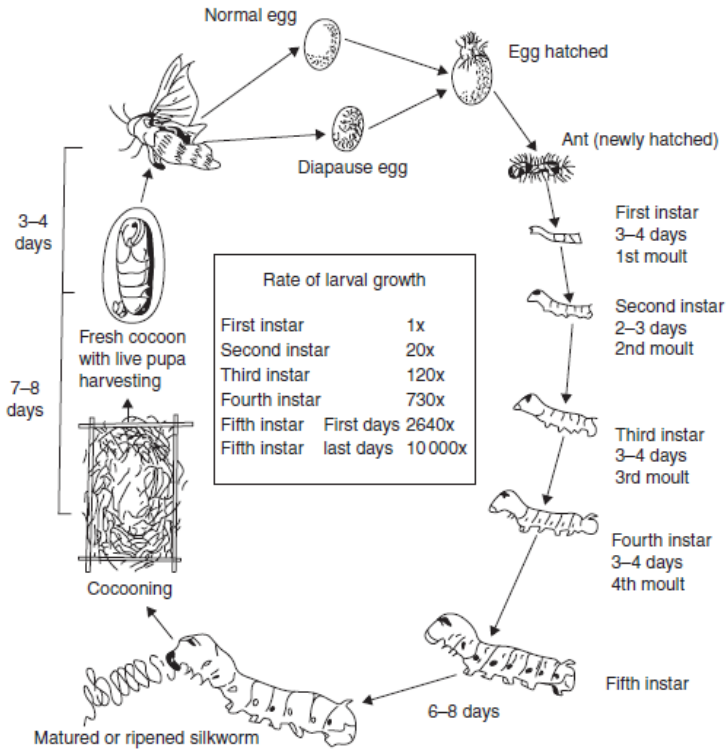


Figure 3.2 The life cycle of a silkworm with the different growth rates of each instar larva. Source: (Babu, 2013).

As depicted in Fig. 3.3, silk is a continuous strand of two fibroin filaments glued together by sericin (or *'silk gum'*), an amorphous glue-like substance (Padamwar and Pawar, 2004; Mondal, Trivedy and Kumar, 2007; Kunz *et al.*, 2016). Fibroins are the protein that constructs the filament of silk (Padamwar and Pawar, 2004; Mondal, Trivedy and Kumar, 2007). Sericin is a globular protein constituting 20-30% of a cocoon's total weight (Padamwar and Pawar, 2004). As suggested in Fig. 3.3, it can be classified as sericin I (outer), II (middle) and III (inner) based on each layer's solubility level (Lee, 1999). Sericin can also be classified into layers I, II, III, and IV (and even layer V), again based on solubility levels, or as sericin A and sericin B based on their distinct layer structures (Komatsu, 1975; Robson, 1985; Sadov, Korchagin and Matetsky, 1987).

Sericin has a highly hydrophilic feature and each layer has different solubility. The outer layer of the cocoon has the greatest sericin content and is more soluble than the inner layers. The innermost layer has the least amount of sericin (Robson, 1985; Mondal, Trivedy and Kumar, 2007). As a result, different degumming techniques are required to extract the sericin available in each layer (Komatsu, 1975; Sadov, Korchagin and Matetsky, 1987; Kunz *et al.*, 2016).

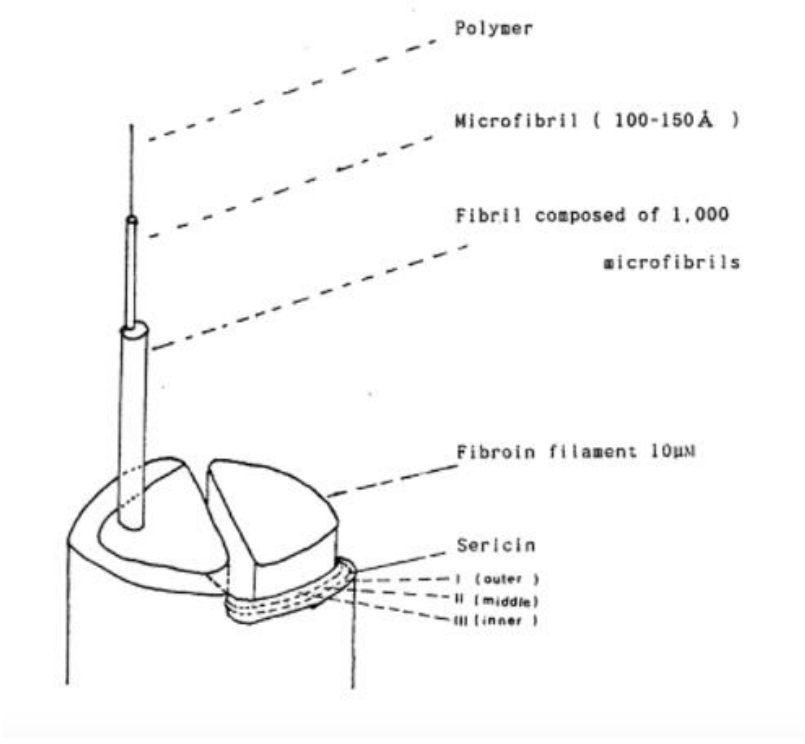


Figure 3.3 A silk filament structure. Source: (Lee, 1999).

Mondal et al. (2007) review how a silkworm produces silk proteins and consider the compositions and properties of fibroin and sericin. Silk threads are excreted through a silkworm's silk gland, which consists of a pair of salivary glands (Mondal, Trivedy and Kumar, 2007; Bahar *et al.*, 2011). Kunz *et al.* (2016) consider the mechanism of how the silk gland is formed and how it functions to produce silk fibroin and sericin.

Fibroins are released from two excretory canals in the spinneret of a silkworm's head and are enclosed by sericin to form the composite silk fibres of the cocoon (Carboni, 1952; Mondal, Trivedy and Kumar, 2007; Joseph and Raj, 2013). Silk is made up of fibroin (70-80%), sericin (20-30%), carbohydrates (1.2-1.6%), wax matter (0.4-0.8%), inorganic matter (0.7%), and pigment (0.2%) (Gulrajani, 1988; Padamwar and Pawar, 2004). Sericin's molecular weight ranges from 10kDa to over 400kDa (Kato *et al.*, 1998; Takasu, Yamada and Tsubouchi, 2002) while the molecular weight of fibroin ranges from 300kDa to 450kDa (Tanaka *et al.*, 1999; Zhou *et al.*, 2000).

Silkworms are attracted to mulberry leaves because their olfactory system functions to recognise leaf volatiles. They can sense *cis*-jasmone (a potent attractant for silkworms) in mulberry leaves and this triggers chemotaxis, causing silkworms to move towards the leaves and consume them (Tanaka *et al.*, 2009). Although *cis*-jasmone is more prominent in mulberry leaves, it is also present in Jasmine flowers (Sundt, Willhalm and Stoll, 1964). However, only mulberry leaves have the necessary nutrients for silkworms' growth (ibid).

Mulberry cultivation is a key factor influencing the quality of the silk proteins silkworms produce. The development of mulberry silkworm populations depends on the quality and nutritional constituents of mulberry leaves (Krishnaswami *et al.*, 1971, 1973). Silk proteins are synthesised from amino acids derived from the proteins in the leaves (Bahar *et al.*, 2011) and different varieties of mulberry leaves offer different protein contents (Abdullaev and Guseinova, 1961; Hassanein and Shaawary, 1962; Krishnaswami, Noamani and Asan, 1970; Quader and Bari, 1989).

After silkworm eggs hatch, the larvae evolve through five instars and four moults (Fig 3.2) before turning into mature silkworms able to form silk

cocoons. During each moult, silkworms temporarily stop consuming mulberry leaves while they shed their old skin and become larger moults (Babu, 2013). Without human intervention, it takes around 2-3 weeks for pupas to metamorphosize into adult moths (ibid).

When silk moths leave the cocoon, they immediately find a member of the opposite sex and mate. The male moth dies within 24 hours of mating, while the female lays an abundance of eggs before dying (Babu, 2013). A silk moths' life cycle lasts about 50 days. This includes an *egg stage* of about 10 days, followed by a *larval stage* of around 25-30 days. As depicted in Fig. 3.4 (EU-Thailand Small Projects Facility, 2007), after the larval stage the larvae transform into pupa inside cocoons, a final stage which takes around another 10 days.

The B. mori silkworms used in silk production are reared indoors and over time have become entirely domesticated (Babu, 2012). As a result, they have evolved with underdeveloped mouths and, as they do not seek food by themselves, rely on humans to feed them during each instar (Tanaka *et al.*, 2009).



Figure 3.4 The different silkworm stages (Council of Agriculture, no date).

Human management plays an important role in the survival of silkworms. Fig. 3.5 shows that sericulturists put mulberry leaves on trays before feeding. To prevent silkworms from becoming deformed or dying, only clean and uncontaminated mulberry leaves can be used (Etebari *et al.*, 2007; Zhang *et al.*, 2008; Bora, Khanikor and Gogoi, 2012; Munhoz *et al.*, 2013; Top and Ucum, 2015).

The feeding duration depends on the larval stage. The amount of food consumed by silkworms rises gradually as the larvae grow (Aruga, 1994). Most consumption (about 83% of the total number of leaves consumed) takes place during the 5th instar (Aruga, 1994). With silkworms requiring such large amounts of fresh mulberry leaves, silkworm rearing houses and mulberry plots are typically located near each other or in the same location (Haggblade and Ritchie, 1992; Takeda, 2009). Silkworms need to be kept away from most chemicals during the rearing period and placed in rearing sheds to protect them from insects and other predators. As suggested in Table 3.1, rearing sheds offer air ventilation and controlled humidity and temperatures to provide an optimum rearing environment (Krishanswami *et al.*, 1973; Datta, 1992; Wani and Jaiswal, 2011; Rahmathulla, 2012; Top and Ucum, 2015).

Park et al. (2007) point out that the larval development of silkworms is negatively affected by the volatilisation of chemical hazards. Exposure to some chemicals can cause *non-spinning syndrome* (Etebari *et al.*, 2007). The temperature of silkworm rearing rooms is also important as it impacts pupation, cocoon forming, and shell weights (Suresh Kumar *et al.*, 2001; Basavaraja *et al.*, 2005; Rahmathulla, 2012).

Table 3.1 The optimum temperature and humidity required during various stages of silkworm (Rahmathulla, 2012).

Environmental Factors	Incubation	I instar	II instar	III instar	IV instar	V instar	Spinning	Cocoon preservation
Temperature (℃)	25	28	27	26	25	24	25	25
Relative humidity	75-80%	85-90%	85%	80%	70-75%	65-70%	70%	80%



Figure 3.5 Farmers continuously feed silkworms with mulberry leaves (Hackethai, 2008).

3.1.1 Mulberry Cultivation

The Mulberry tree (*Morceae Morus*) is a fast-growing, deciduous, perennial plant (Takeda, 2009; Babu, 2013) with a lifespan of at least 15 years (Ullal and Narasimhanna, 1981; Inserco, 2013). There are about 68 species of mulberries with the majority found in Asia (China hosts 24 species and Japan 19 species; Babu 2013). Mulberry trees grow in almost any type of soil and are tolerant of a range of climatic conditions (Babu, 2013; Inserco, 2013). Physical features, such as the tenderness and thickness of mulberry leaves, are important factors in attracting silkworms (Tribhuwan and Mathur, 1989). As leaves from the same mulberry tree can have different physical and chemical properties, including different amounts of fibre, water content, carbohydrates and protein (Quader, 1987), they have to be picked from different parts of a tree to suit the silkworm's growth rates at each instar stage (Agricultural Technologies, no date; Quader, 1987; Sovacool, 2013).

The proper selection of mulberry leaves is vital for successful silkworm rearing. The water content of the leaves plays an important role in the silkworm's ingestion and digestion processes (Ullal and Narasimhanna, 1981). Typically, First and second instar larvae require softer and more tender leaves. As a result, to feed larvae at this stage of their development

leaves must be picked from the top of a mulberry tree (Agricultural Technologies, no date) as they contain less fibre, but are high in moisture and protein (Sovacool, 2013). Third instar larvae require darker green leaves that are less tender and can be picked from the lower part of the top of a tree. Fourth and Fifth instar larvae demand mature leaves with higher levels of protein and carbohydrate that are picked from the lower parts of a tree (Agricultural Technologies, no date; Quader, 1987; Sovacool, 2013).

The quality and nutrient contents of mulberry leaves are influenced by a range of environmental factors including climate, exposure to sunlight, soil quality, and irrigation (Bergmann, 1940; Legay, 1958; Hassanein and Shaawary, 1962; Narayana, Kasiviswanathan and Iyengar, 1967; Mustafaev, 1968; Das and Sikdar, 1970; Kasiviswanathan, Iyengar and Krishnaswami, 1970; Krishnaswami *et al.*, 1973; Babu, 2013). All mulberry species grow well in areas with an annual rainfall ranging from 600mm to 2,500mm (Babu, 2013). Arid and semi-arid environments with low rainfall ($<600 mm a^{-1}$) produce low yields of mulberry leaves (ibid). Soil conditions also influence growth rates as some mulberry species prefer deep, fertile, well-drained, and porous soil with good moisture holding capacity and an optimum pH of 6.5-6.8 - 'neutral' to 'slightly acidic' (ibid).

3.1.2 Silk Production

To produce uniform cocoons that are easier to collect, traditional silkworm rearers often move cocoons onto woven circular bamboo frames (Fig. 3.6) when they start to form (Hackethai, 2008). Before pupas destroy their cocoons to become moths, silkworm rearers boil complete cocoons while reeling silk yarns; this process kills pupas which will be either consumed as human food or sold by silkworm rearers (Haggblade and Ritchie, 1992; Yhoung-Aree, Puwastien and Attig, 1997; Hanboonsong, 2010; Durst and Hanboonsong, 2015). The boiling temperature can be different for each location, depending on its altitude. As shown in Fig. 3.7, the silk reeling process requires silk cocoons to be boiled together. A filament is pulled from each cocoon and together they are put through a pulley that produces silk threads of the required thickness (Boonchoo and Rakpong, 2011). Farmers combine several silk threads to form a single silk yarn. Several yarns are then twisted together to give silk its sheen (Haggblade and Ritchie, 1992).

Boiling cocoons results in a 1%-3% loss of sericin (Gulrajani, 1992). Traditionally, silk yarns are degummed to dissolve sericin from silk filaments (fibroins) using an alkaline solution such as sodium carbonate (Na_2CO_3) (Morton, 1989; Babu, 2012; Johnson, 2015). The resulting sericin wastewater has a high Chemical Oxygen Demand (COD) value and is discarded (Haggblade and Ritchie, 1992; Fabiani *et al.*, 1996; Javali *et al.*, 2015). The silk yarns can then be dyed before weaving.



Figure 3.6 Cocoons being moved onto a circular bamboo frame. Source: (Hackethai, 2008).



Figure 3.7 Silk reeling process. Source: (World Fairtrade Organization, no date).

3.1.3 Soap Making

The economic benefits of using sericin in soap and cosmetics coupled with encouragement from Thai government agencies have led to changes in traditional degumming practices (MOST, 2015; MOAC, n.d.; Neal, 2014). Rather than using an alkaline solution to dissolve sericin, some sericulturists now use more environmentally-friendly approaches. As depicted in Fig. 3.8, these include boiling cocoons in a *High Temperature and High Pressure* (HTHP) pressure cooker (Nontume Craftmanship group 2015; MOST 2015b).

Both Na_2CO_3 and HTHP treatments adequately extract low and high molecular weight sericin from each silk filament layer (Fabiani *et al.*, 1996; Rockwood *et al.*, 2011; Silva *et al.*, 2012; Javali *et al.*, 2015). Kunz et al. (2016) reviewed a number of methods designed to extract different molecular weights of sericin. The alkaline method of extraction (e.g. Na_2CO_3 degumming) is not favoured when sericin is to be used as an active ingredient in cosmetics. This approach results in impurities in the sericin solution that must be removed using nanofiltration or ultrafiltration to produce pure sericin (Fabiani *et al.*, 1996; Aramwit, Siritientong and Srichana, 2012). This is both inconvenient and expensive (Javali et al., 2015).

Conversely, the HTHP method requires boiling silk at 110℃ for 8-10 minutes at high pressure or at 130℃ at 3-4 bar (Fabiani et al., 1996) - a significantly less complex procedure that causes minimal damage to silk yarn and produces pure sericin more quickly (Javali *et al.*, 2015). Javali et al. (2015) argue that the HTHP extraction method maximises the removal of low and high molecular weight sericin which is free of chemical contamination. The purity of the resulting sericin means it can be used in cosmetics and in the production of pharmaceuticals.

Different extraction methods remove different molecular weights of sericin (Zhang, 2002; Freddi, Mossotti and Innocenti, 2003; P. Vaithanomsat and Kitpreechavanich, 2008; Silva *et al.*, 2012). The different molecular weights of sericin peptides define their solubility and suggest possible uses (Zhang 2002). Different sizes of silk particle determine the extent to which sericin can penetrate hair and skin, and this determines what possible cosmetic applications sericin can be used for (NDA, 2015). The more deeply a silk particle penetrates hair or skin, the greater its therapeutic qualities (NDA

2015). When sericin peptides weigh less than 20kDa, they are suitable for skincare and haircare products (Zhang, 2002). High-molecular sericin peptides (>20kDa) are more commonly used for medical biomaterials, compound polymers, functional fibres, and fabrics (Zhang, 2002).



Figure 3.8 Sericin extraction by boiling silk cocoons in a HTHP pressure cooker. Source: (Teschari *et al.*, no date)



Figure 3.9 Sericin extracts obtained from the HTHP process. Source: BEDO.

Once sericin is extracted (Fig. 3.9) it can be mixed with glycerine, botanical additives, preservatives and fragrances to produce either soap bars or liquids. Producing soap bars is obviously more time consuming as solid glycerine must be heated before other ingredients are added. As shown in Fig. 3.10, the resulting liquid is then poured into moulds, cooled, and allowed to set. Conversely, liquid glycerine and other additives can simply be added

directly to liquid soaps (Teschari *et al.*, no date). However, no studies have examined the differences and similarities of the commodity chain of sericin soap bars and liquids, including their impacts; they only indicate that sericin soap (regardless of its type) can affect the community and the environment at the same level (TINT, 2010; Clinic Technology, 2014; Neal, 2014).



Figure 3.10 Once the sericin solution is mixed with glycerine liquid and other additives, it is poured into moulds to produce soap bars. Source: (Teschari *et al.*, no date).

The Royal Thai government has shared a simple soap-making procedure with members of the public, giving everyone free access to the information presented in Fig. 3.11. It is not clear how sericulture community enterprises that have received this information are now able to differentiate themselves in the marketplace, or how increased competition has affected either chain actors' behaviour or their trade environments. At present, these enterprises (which are supervised by government agencies) all use sericin extract from yellow Thai silks (TINT, 2010; Clinic Technology, 2014; Neal, 2014).



Figure 3.11 Soapmaking brochure prepared by the Clinic Technology office. Source: MOST.

3.2 The Thai Silk Industry

Silk is predominantly produced in rural areas in the North and Northeast regions of Thailand, where about half a million farm households are involved in silk yarn and fabric production (Naenna, 1984; Haggblade and Ritchie, 1992; Payanun, 1995; EU-Thailand Small Projects Facility, 2007). About 60% of Thai sericultural families reside in only four provinces in the Northeast region which includes Khon Kaen, Mahasarakam, Buriram and Nakhon Ratchasima (Agrifood Consulting International, 2005).

Silk production plays an important part in alleviating poverty in terms of income enhancement and supporting the livelihoods of local people in the rural North and Northeast regions of Thailand (Naenna, 1984; Singha, 1989; Haggblade and Ritchie, 1992; Datta, 1996; UNCTAD/WTO, 1997, 2002; Yoshida, 1999; EU-Thailand Small Projects Facility, 2007; Santitaweeroek, 2008; Earth *et al.*, 2008; Kasi, 2009; Dewangan, Sahu and Achari, 2011; Dewangan, 2013; Dewangan *et al.*, 2013; International Sericultural Commission (INSERCO), 2013; Stanley and Preetha, 2016).

Poverty was particularly pertinent to the 'Deep South', Northeast and North regions between 1988 and 2002 as shown in Fig. 3.12. As depicted in Fig. 3.13, more than 80% of Thailand's poor resided in rural areas in 2000 (World Bank, 2016). In these figures, poverty is measured based on household income and purchasing power in relation to the consumption basket and permit comparison across time and location. This study does not take into account people's perspectives on poverty or any other variables which could be used to present a more holistic view of poverty.

Figures released by the World Bank (2019) show that the poverty headcount ratio (% of population) at the national poverty line in Thailand decreased drastically from 2000 to 2016, while the country's Gross Domestic Product (GDP) increased. There are no statistics available to demonstrate current levels of poverty. As a result, it is unclear as to whether there have been changes in demographics in terms of poverty or changes to where poverty might exist.

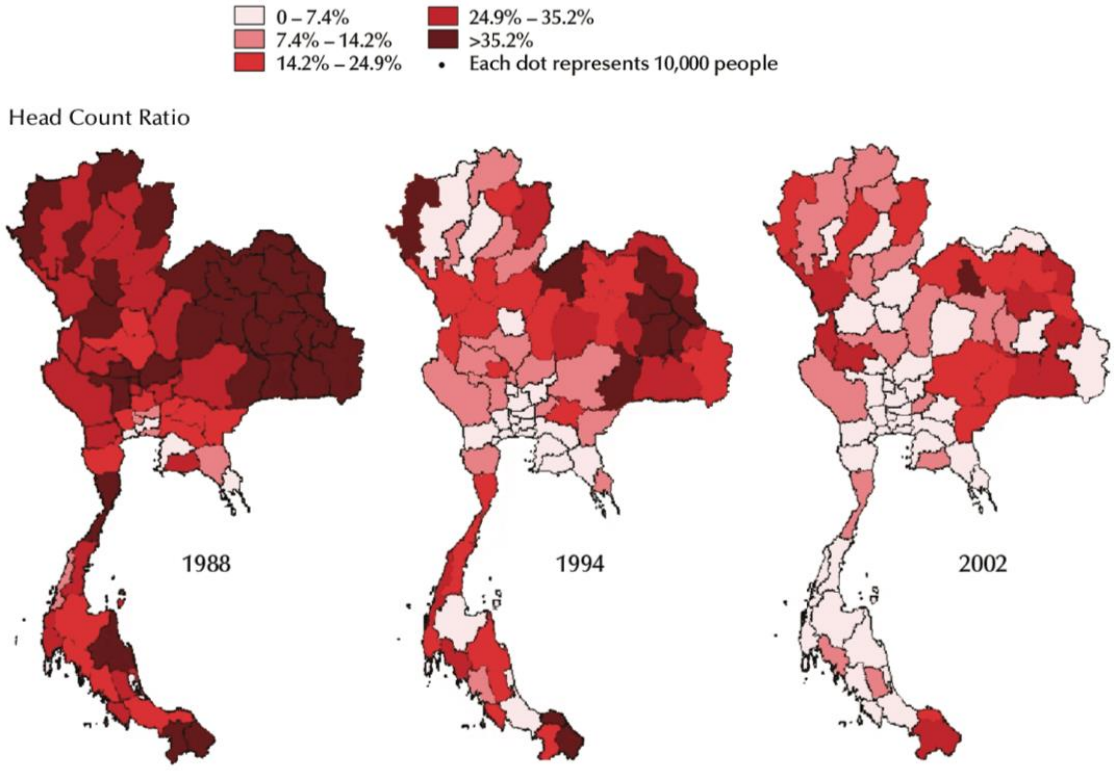


Figure 3.12 Poverty headcount ratio and distribution by province in Thailand in 1988, 1994 and 2002. Source: (NESDB and the World Bank, 2005).

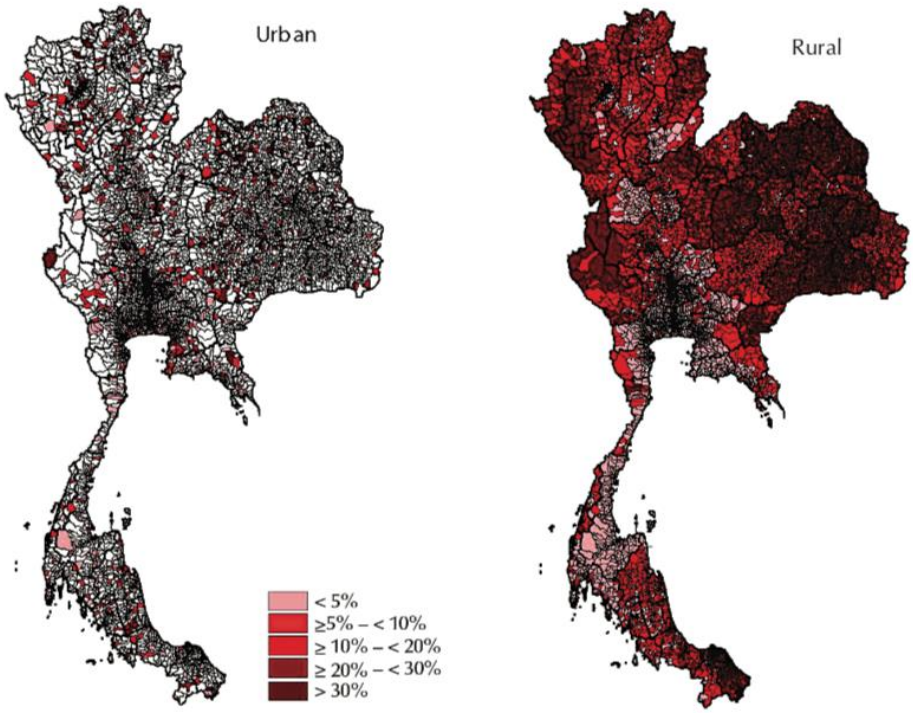


Figure 3.13 The poverty headcount ratio in Thailand in urban and rural areas in 2000, suggesting that the majority of the poor resides in rural areas. Source: (Jitsuchon and Richter, 2006).

Silk is important in terms of a number of social, economic and cultural elements for many low-, middle-, and high-income countries (Singha, 1989; Yoshida, 1999; Earth *et al.*, 2008; Santitaweeroek, 2008; Dewangan, 2013; Dewangan *et al.*, 2013; Marella, 2013; Patichol, Wongsurawat and Johri, 2014a). In Thailand, the pattern and style of silk fabrics and silk handicrafts are linked to the heritage of the Thai people (Jory, 1999), connecting them to their origins and highlighting the skill of silk weavers (Sawasdee, Yodmalee and Phaengsoi, 2015). At the community level, Thailand produces about 285 tonnes of silk yarns per year, twice that of factory level production in 2003 (QSDS, 2014). This highlights the potential of unused sericin. This research argues that sericin soap production is predominantly related to areas of silk production as these areas represent the main sources of sericin.

In 2003, the majority of silkworm rearers were found in Thailand's Northeast, as was the bulk of mulberry cultivation and silk yarn production (see Figs. 3.14-3.16 respectively). At present no statistics are available to show how this data might have changed. Despite this, a general trend for the whole of Thailand established between 1987 and 2009 suggests a

reduction in the number of silkworm rearers and silk production alongside a reduction in the size of mulberry farms (QSDS, 2009). This may be due to farmers choosing to work in other sectors that offer higher incomes (Graham, 2011; QSDS, 2014).

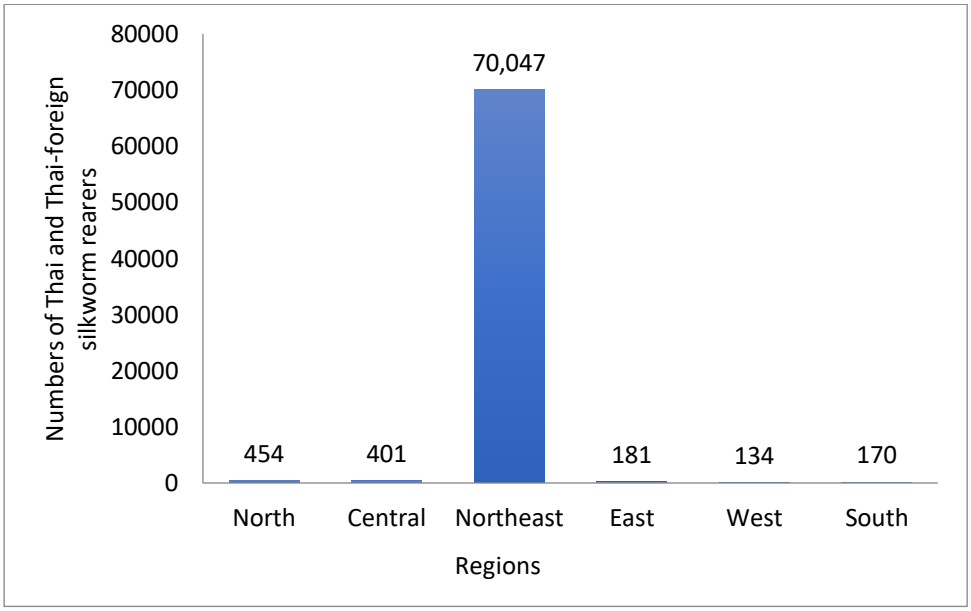


Figure 3.14 Numbers of Thai and Thai-foreign silkworm rearers at the community level in each region of Thailand in 2003. Source: (QSDS, 2014).

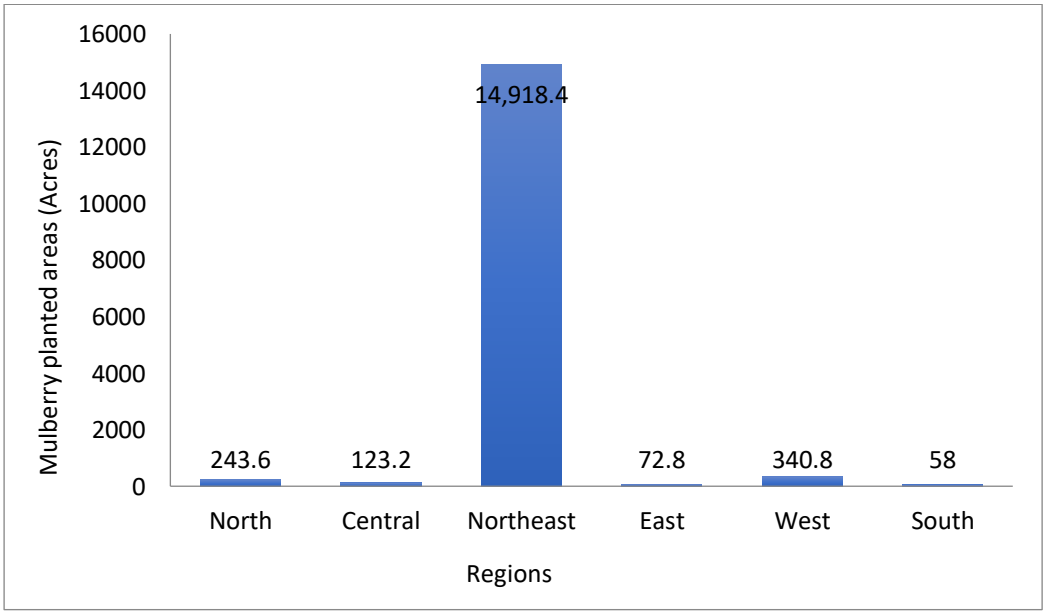


Figure 3.15 Total size of mulberry farms at the community level in each region of Thailand in 2003. Source: (QSDS, 2014).

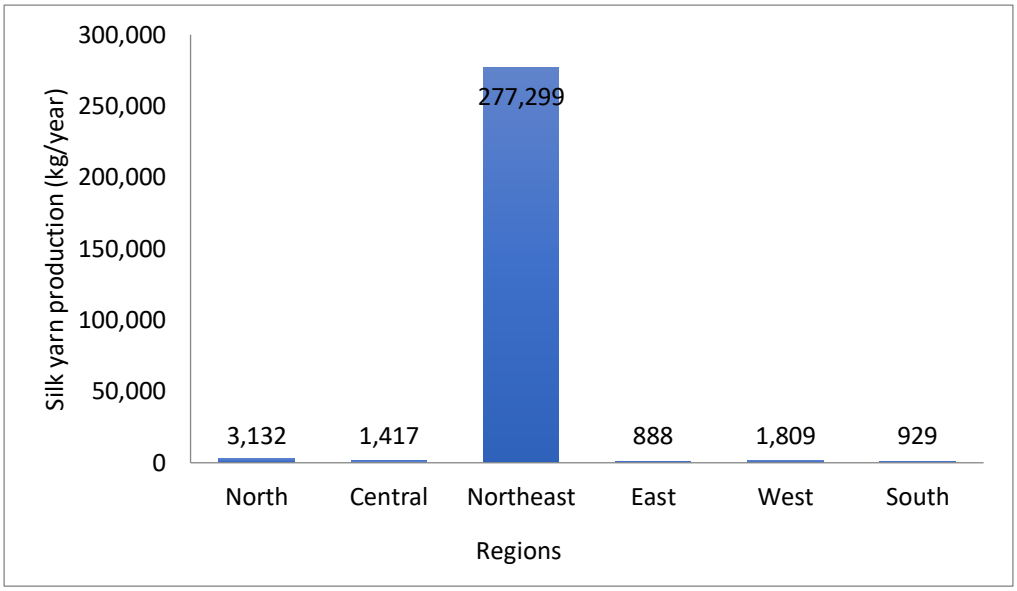


Figure 3.16 indicates silk yarn production at the community level in each region of Thailand in 2003. Source: (QSDS, 2014).

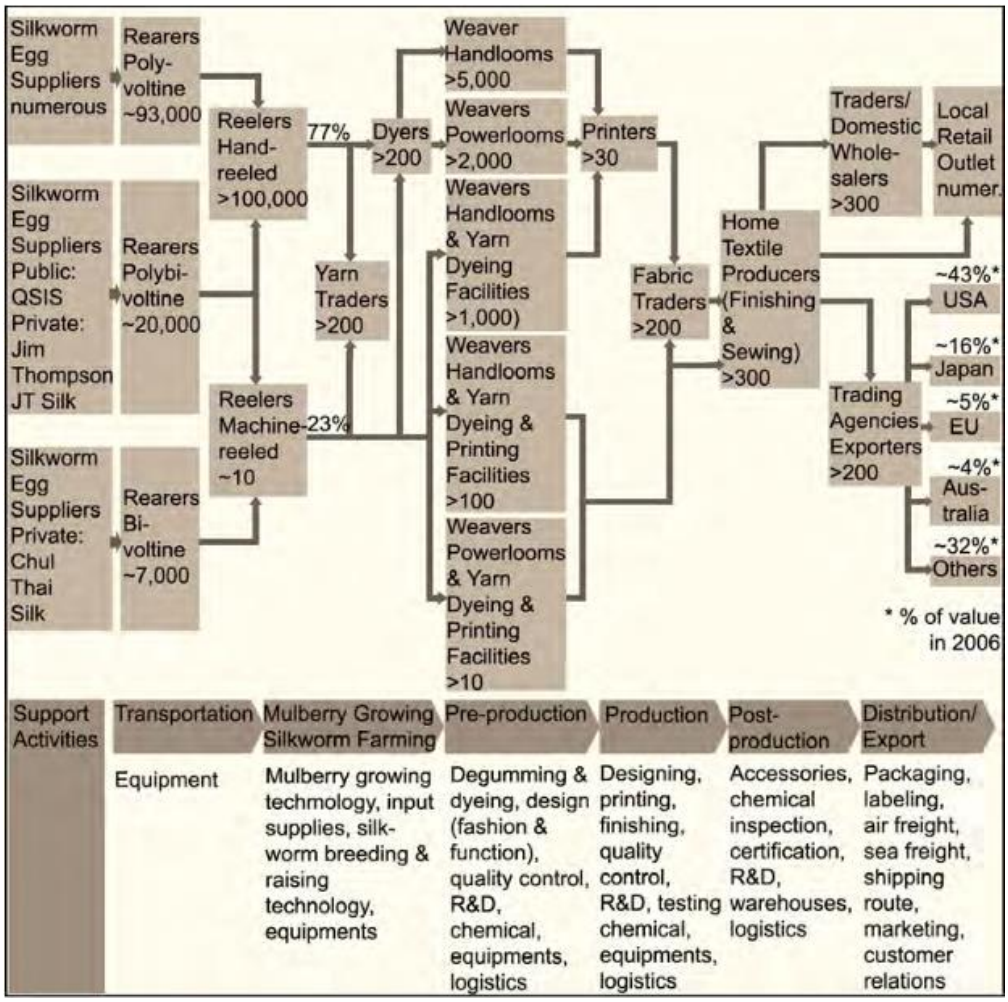


Figure 3.17 The silk value chain of the Northeastern silk textile industry in Thailand. Source: (EU-Thailand Small Projects Facility 2007).

Conway (1992) notes that sericulture has played a dominant role in 'Isan' – Thailand's Northeast region. Isan farmers follow traditional sericulture practices passed on by their parents and ancestral traditions. The EU-Thailand Small Projects Facility (2007) notes that the structure of the Isan silk textile sector is quite complex as some farmers play multiple roles in the supply chain (e.g. silk producers and silk weavers). Fig. 3.17 presents an overview of the Isan silk textile value chain.

Women are recognised as being central to silk production and silk weaving in the Thai silk industry, especially women in the Isan region (Haggblade and Ritchie, 1992; Earth *et al.*, 2008; Siewsamdangdet, Vemuri and Bretherton, 2010) who are normally engaged as resource managers and leaders (Earth et al. 2008). The gender role has been largely discussed in the sericulture literature, especially in the upstream part of the silk value chain (Singha, 1989; EU-Thailand Small Projects Facility, 2007; Earth *et al.*, 2008; Weir, 2008; Patil *et al.*, 2009; Eswarappa, 2011; Dewangan, 2013; Dash, Dash and Behera, 2015). However, the gap in research relating to soap production means gender division of labour and the identities of soapmakers are still not understood (Clinic Technology, 2012a, 2013a, 2014; BEDO, 2016b). As a result, whether soapmakers have similar or different identities, lifestyles, and social status to sericulturists is open to debate.

As presented in Fig. 3.17, Thai silk value chains can be characterised by the type of silkworm sericulturists rear (Agrifood Consulting International, 2005; EU-Thailand Small Projects Facility, 2007). At present, three classifications exist: Polyvoltine (native Thai), Poly-bivoltine (Thai-hybrid) and Bivoltine (imported). The Royal Thai government has established a framework for the expansion of activity in each category and determined which actors should be involved. Non-government organisations (NGOs) manage the expansion of activity related to local species of silkworm, while the government itself manages that related to Thai hybrid species. Activity for imported species is managed by the industry (Earth et al., 2008). This move aims to transform an unpaid and low-priority occupation that is dominated by women into a livelihood strategy that both men and women can benefit from (Earth et al., 2008).

Polyvoltine silkworms are a native Thai variety that produce low yields of small, yellow cocoons (Payanun, 1995; Agrifood Consulting International,

2005) that are highly resistant to disease (Agrifood Consulting International, 2005; EU-Thailand Small Projects Facility, 2007; Boonchoo, 2008). In general, native Thai silkworms consume fewer mulberry leaves in their lifecycle compared to Thai-hybrid and foreign silkworms (QSDS, no date b).

Boonchoo (2008) maintains that 85% of traditional silk producers reside in the Northeast of Thailand. Other research suggests traditional silk producers consider sericulture a hobby and a secondary occupation after farming (Boonchoo 2008; Agrifood Consulting International 2005). Haggblade & Ritchie (1992) conclude that traditional silk production is characterised by low cost, low volume production practises that utilise low levels of technology and generate limited revenue. They go on to suggest that traditional silk producers perform all production functions themselves, including growing mulberry trees, rearing silkworms, reeling cocoons into yarn, and manually weaving yarns into cloth which will be used in their households and sold locally. Generally, traditional silk producers only stock the type of silkworm eggs that produce cocoons that must be hand-reeled (Agrifood Consulting International, 2005; EU-Thailand Small Projects Facility, 2007).

Poly-bivoltine (Thai-hybrid) silkworms are crossbred from polyvoltine and foreign bivoltine silkworms (Payanun, 1995; Agrifood Consulting International, 2005). Agrifood Consulting International (2005) states that poly-bivoltine silkworms produce intermediate size yellow silk cocoons that can be both machine- and hand-reeled. These cocoons produce more silk yarns than the native Thai variety, but are more susceptible to disease than polyvoltine silkworms (Agrifood Consulting International, 2005; NESDB and the World Bank, 2005; EU-Thailand Small Projects Facility, 2007; Boonchoo, 2008). Poly-bivoltine silkworm eggs can only be purchased from Queen Sirikit Sericulture Centres (QSSCs) in Thailand (Boonchoo, 2008; Agrifood Consulting International, 2005). With a limited supply of Thai-hybrid silkworm eggs, most silk producers raise native silkworms alongside yellow hybrids (Haggblade & Ritchie, 1992).

About 80% of Poly-bivoltine farmers reside in Isan (Boonchoo, 2008). They are more commercially oriented (Boonchoo, 2008; Agrifood Consulting International, 2005) and while Haggblade & Ritchie (1992) argue that, like polvoltine silk farmers, poly-bivoltine farmers typically produce silk for use in their own households, they are more likely to supply silk yarns to factories

and merchants. They go on to suggest that poly-bivoltine farmers produce more silk and generate more income than polyvoltine farmers.

Bivoltine silkworms are imported from either China or Japan (Boonchoo, 2008). They produce large, white cocoons that are only suitable for machine reeling (Payanun, 1995; Agrifood Consulting International, 2005; Boonchoo, 2008). This type of silkworm is susceptible to disease and using them in silk production requires higher levels of investment than when native Thai and Thai-hybrid silkworms are used (EU-Thailand Small Projects Facility, 2007). In addition, bivoltine silkworm rearers need to undergo intensive training before companies will allow them to handle their silkworm eggs. Bivoltine silk farmers are therefore engaged in sericulture on a commercial basis and regard it as their main occupation (Boonchoo, 2008). Agrifood Consulting International (2005) argues that only a minority of silk farmers belong to this category of producers and most of these are contracted to major silk producers like Jim Thompson and Chul Thai Silk.

The labour involved in rearing each variety of silkworm has its own gender division, dominated by women (Earth et al., 2008). But the bivoltine silkworm rearing sector draws more participation from men compared to other types of silkworm rearing. This is because women are found to be more allergic to the chemicals used in this type of silkworm rearing than men, and men therefore have to assist their partners when applying chemical additives. However, this might depend on characteristics and health conditions of locals and geographies of silk production which influence certain gender to participate in this activity more. Due to health concerns and strict industrial requirements, Earth et al. (2008) argue that the imported silkworm rearing sector is unlikely to fit easily into the village context in Thailand.

As previously stated, many sericulturists who rear native Thai and Thai-hybrid silkworms consider farming their primary occupation. Thai farmers are typically engaged in four types of farming: cultivating crops, rearing livestock, freshwater culture, and sea salt farming. The majority (96.3%) are involved in crop cultivation (NSO, 2013).

Falvey (2000) argues that agriculture has helped form Thailand and shaped its identity. Rural farmers (with farms of 3-4 Hectares) perceive agriculture

as a way of life that offers them self-reliance in terms of employment and food security. It also provides a social safety net that is needed for Thailand's development and offers a foundation for environmental conservation, solidity, crisis resilience, and cultural protection (Falvey, 2000; Jitsanguan, 2001). 87.6% of Thai farmers tend their own farms and have less than 6.4 Hectares of land (NSO, 2013). To minimise costs most farms are run by family members and additional labour is rarely engaged (Falvey, 2000). Rural farmers produce the majority of Thailand's agricultural products and represent the bulk of the country's labour force (ibid).

Farming is conducted on a commercial basis; it allows farmers to be self-sufficient (Falvey, 2000; Agrifood Consulting International, 2005). This is particularly the case in Isan when compared to other parts of Thailand (Agrifood Consulting International, 2005). Valeepitakdej & Wongsurawat (2015, p.742) believe that farming is not just an occupation but 'a family heritage and treasured culture' in Thailand.

In 2013, Thailand's National Statistical Office (NSO) demonstrated that Thailand had about 5.9 million agricultural households. 46.4% of the country's agricultural households were in Isan, but within the region 46.9% of all households were agricultural holdings (NSO, 2013). After Isan the North of the country had the most agricultural households (22.0%) and areas (23.3%) (NSO, 2013). In 2003, NSO figures show that the highest education of 64.1% of rural farmers was secondary school, and in 2013, 71.3% of farmers had a yearly income of less than THB100,000 (approximately £2,000) (£1=THB50).

While farming makes a major contribution to Thailand's economy and culture, as a type of employment it is fraught with risk. This includes production risk (e.g. weather conditions, pests, diseases, and technological change), environmental risk (e.g. climate change and change in natural resources such as water), market risk (e.g. price fluctuations and competition with new products), regulatory or institutional risk (e.g. changes in agricultural policy), human and personal risk (e.g. illness and death, and financial risk (from loans, etc.) (Huirne *et al.*, 2000; OECD, 2000; Musser and Patrick, 2002; Hardaker *et al.*, 2004; Kahan, 2008). To mitigate the financial impact of such risk and maintain a sustainable lifestyle, farmers

engage in a number of activities aside from farming (The Chaipattana Foundation, no date; Jitsanguan, 2001).

3.3 Exploring Soap Value Chains

While soap production is a by-product of silk production, as Figs. 3.17- 3.19 suggest, only the value chains of silk production have been explored in any depth (EU-Thailand Small Projects Facility, 2007; Graham, 2008; Nguyen and Eiligmann, 2010; Vollrath *et al.*, 2013; Patichol, Wongsurawat and Johri, 2014a, 2014b). The inputs and outputs of silk production, the identities of chain actors and value added across the chain have all been identified (EU-Thailand Small Projects Facility, 2007; Nguyen and Eiligmann, 2010; Vollrath *et al.*, 2013; Patichol, Wongsurawat and Johri, 2014a, 2014b; Astudillo, Thalwitz and Vollrath, 2015; Javali *et al.*, 2015). Figures 3.20-3.22 present the inputs and outputs of silk production. With a variety of chain actors, inputs, outputs and environments associated with a unique commodity system, each silk value chain has its own distinct characteristics and features.

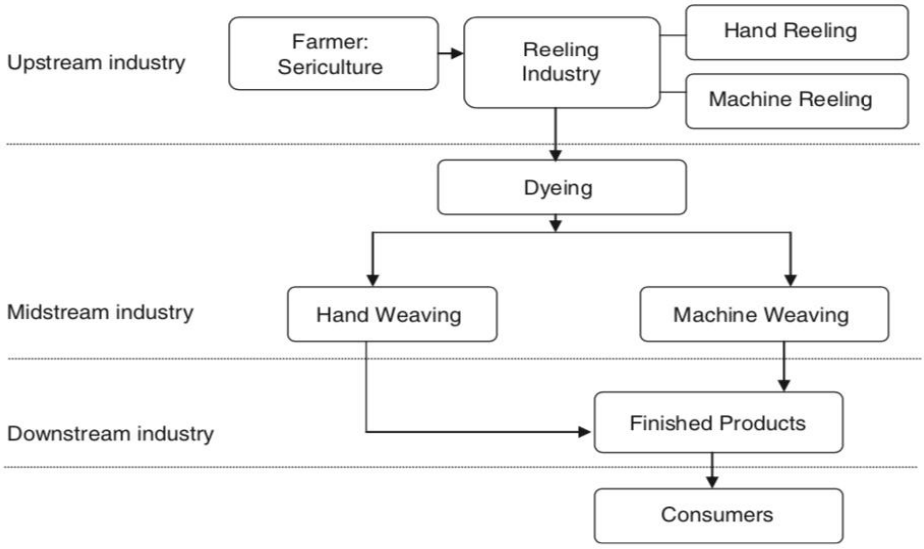


Figure 3.18 The Thai silk industry value chain. Source: (Patichol, Wongsurawat and Johri, 2014b).

The EU-Thailand Small Projects Facility (2007) characterises the Thai silk industry as high risk and low return, especially for upstream actors. Silk producers (upstream actors) generate the least amount of profit in the silk value chain, while retailers and exporters generate the most. This is because

some producers lack market insights and this significantly weakens their ability to negotiate with other actors and control product selling prices.

However, this situation might have changed. The introduction of the Internet has given actors more access to data and improved their ability to reach consumers directly and sell products without requiring intermediaries (Graham, 2008, 2011b, 2011a). However, some producers with Internet access are not able to use the information it offers to their advantage and are unfamiliar with areas like online marketing. As a result, many rely on traders to reach wider markets both online and offline (Graham, 2008, 2011b, 2011a; Molony, 2008). Similarly, Molony, (2008) concludes that regardless of the availability of Information and Communication Technologies (ICT), farmers have established long-term relationships with traders and lack real negotiation power or the ability to increase their prices. As such they remain entirely dependent on traders.

Alternatively, a lack of infrastructure availability coupled with the cost of technology might have prevented rural producers from benefitting from the Internet. In addition, some producers might not have the capability to use the technology. As such, they would be unable to engage in online trading or connect with consumers in wider geographies (Graham, 2011b).

Regardless of whether a producer has access to the Internet or the capability to use it, Graham (2010) argues that it has not had any noticeable impact on the incomes of silk producers or weavers, or on silk prices. Silk producers often do not recognise what their consumers want and are at a disadvantage regardless of whether technology is used or not (Graham, 2008, 2011b, 2011a). Consumers buy products from brands they perceive credible, share their values and offer the purchasing methods that suit their preference whether through a website or a physical location (Park and Kim, 2003; Kwon and Suh, 2004; Ha and Perks, 2005; Korgaonkar *et al.*, 2010; Jacinto and Pomeroy, 2011).

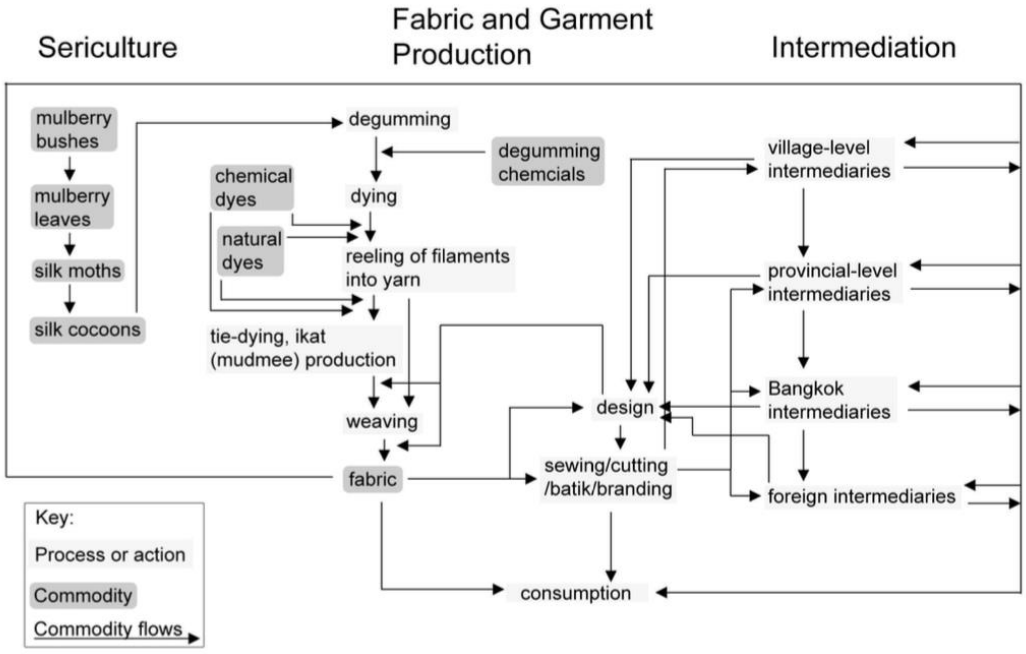


Figure 3.19 The Thai silk commodity chain. Source: (Graham, 2008).

Only a limited amount of research has focused on the obstacles that prevent producers from reaching consumers directly and force them to rely on middlemen. The EU-Thailand Small Projects Facility argues that the presence of middlemen reduces financial efficiency and levels of trust among stakeholders. Trust encourages actors to trade with each other and is one of the key factors in successful supply chain performance (Kwon & Suh, 2004; Jacinto & Pomeroy, 2011). However, the obstacles traders face when trying to meet consumers' expectations has not been considered. Traders help connect producers and consumers through their distribution channels. This increases a product's value and can make it more appealing in a variety of markets (Schmidt and Ruiz, 1996; Forstner, 2004; Graham, 2008; Hingley, Lindgreen and Beverland, 2010; Patichol, Wongsurawat and Johri, 2014b).

Current literature does not consider chain actors' socio-economic backgrounds and cultures, the relationship between the various actors, and the risks actors face that must be overcome (EU-Thailand Small Projects Facility, 2007; Nguyen and Eiligmann, 2010). Consequently, there is also a lack of understanding as to why chain actors make certain decisions, and this can lead to prejudice and further misunderstanding amongst the other actors.

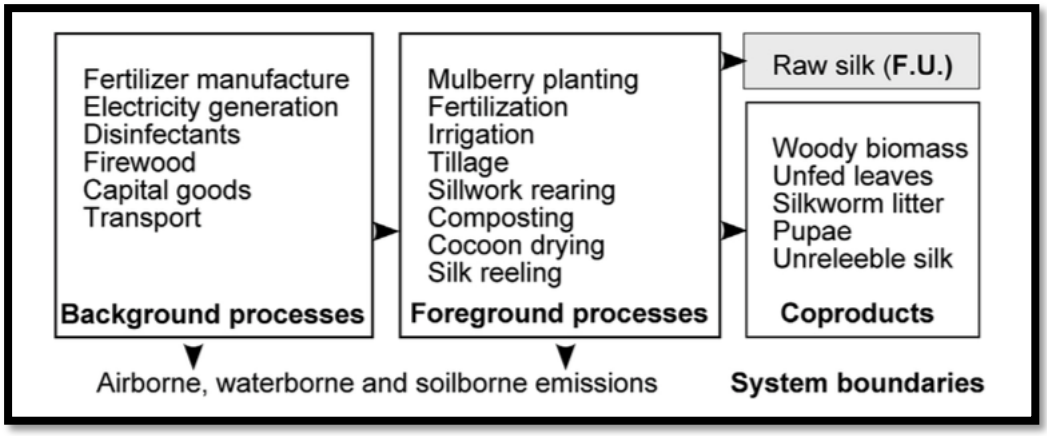


Figure 3.20 The system boundary of the raw silk production in India. Source: (Astudillo et al., 2015).

Each silk production system boundary has a set of inputs and outputs which may be similar or differ from each other. These are dependent on actors' practices, which in turn are influenced by their cultures and norms (Vollrath et al., 2013; Astudillo et al., 2015; Javali et al., 2015). As a result, each silk value chain can have different social, economic and environmental impacts (EU-Thailand Small Projects Facility, 2007; Vollrath *et al.*, 2013; Patichol, Wongsurawat and Johri, 2014b; Astudillo, Thalwitz and Vollrath, 2015).

Examples of raw silk production inputs include the disinfectants used in silkworm rearing, the chemicals used for cleaning rearing beds, insecticides, pesticides, artificial fertilisers, manure, firewood, and water (Astudillo et al. 2015; Vollrath et al. 2013). The chemicals used in production include glyphosate (Datta, no date; Caseley, Cussans and Atkin, 1991; Krishna, 2012), paraquat dichloride (Caseley, Cussans and Atkin, 1991), wood vinegar (Poedi *et al.*, no date), fermented neem solution (Sakthivel *et al.*, 2014), slaked lime (QSDS, no date; Subramani and Somasundaram, 2015; Sujatha and Sathish, 2017), and paraformaldehyde (QSDS, no date; Subramani and Somasundaram, 2015; Sujatha and Sathish, 2017), each of which are applied at different stages of the process.

For the output of the silk production, raw silk production generates a certain amount of waste, and this can include leftover mulberry leaves, silkworm litter, pupas, unreelable silk, and silk wastewater (Vollrath *et al.*, 2013; Astudillo, Thalwitz and Vollrath, 2014, 2015; Javali *et al.*, 2015). Some communities and individuals value this waste differently, and as a result they

may choose to recycle some types of waste and disregard others (Yhoung-Aree, Puwastien and Attig, 1997; Hanboonsong, 2010; TINT, 2010; Vollrath *et al.*, 2013; Astudillo, Thalwitz and Vollrath, 2015; Durst and Hanboonsong, 2015; Javali *et al.*, 2015).

As previously mentioned, to date no studies have examined the soap commodity chain and little is understood about the possible chain actors that might be involved in this system (TINT, 2010; Clinic Technology, 2012b, 2013; Neal, 2014). Hence, issues like the social status, lifestyles and identities of soap commodity chain actors have never been properly considered. This is also the case as far as the relationships, interdependence, dominance, and exploitation between chain actors are concerned. Besides, the gaps in current literature show that the commodity chain characteristics of soap bars and soap liquids have never been fully examined. Likewise, there is little insight into soap value chain processes or the pollution they may cause, nor how profit might be distributed across the chain. The issues and obstacles chain actors might face have yet to be considered, as have the impacts of the commodity chain on communities and the environment. Consequently, the similarities and differences between the impacts of soap value chains are still therefore unrecognised.

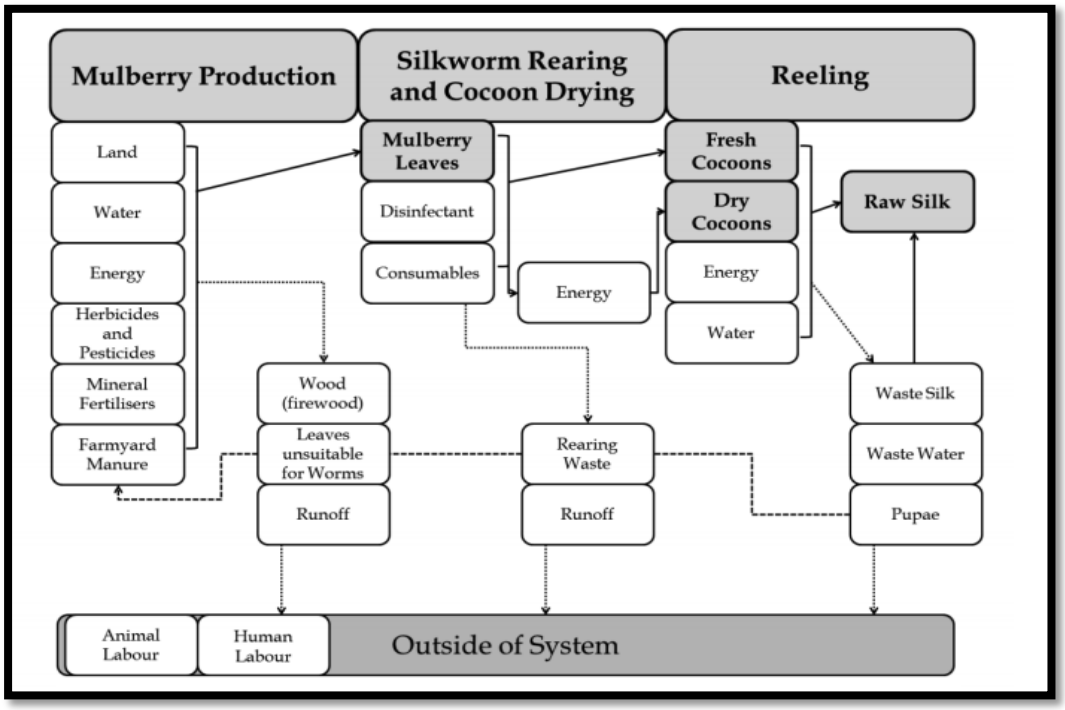


Figure 3.21 The input supply used and wastes generated during sericulture activities in India (Vollrath *et al.*, 2013). Solid lines show primary inputs and dotted lines are for waste and co-product flows.

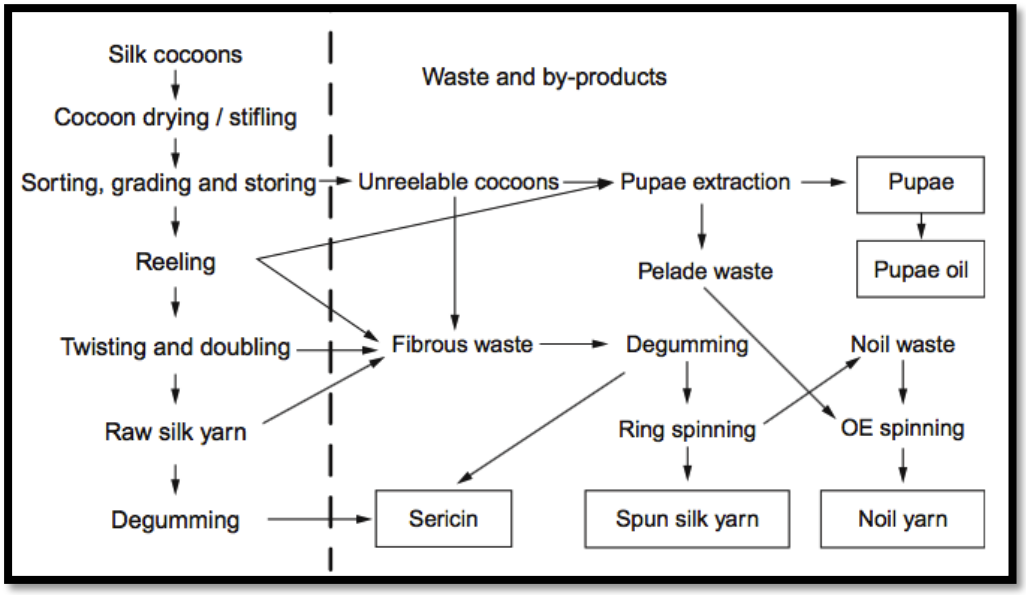


Figure 3.22 Wastes and by-products from the raw silk production which are reused in the process. Sericin is considered waste. Source: (Javali *et al.*, 2015).

3.4 Soap Consumption in Thailand

Unlike traditional soap, there has been no research into the potential size of the sericin soap market or the characteristics and consumption behaviours of potential sericin soap consumers. This might be because production rates and the soap's commercial value are still considered limited when compared to other kinds of cosmetics. Nonetheless, there is a demand for sericin soap products in both the domestic and international markets (Clinic Technology, 2014; Neal, 2014).

Increasing demand for soap has led to expansion in the global soap market. IMARC (2017) suggests that 40% of the market is taken by the Asia Pacific region, followed by Europe, and then North America. In 2017, the total value of the global bath soap market was US$18.6 Billion and between 2010 and 2017 its compound annual growth rate was 5% (IMARC, 2017). The International Trade Administration (2018) presents that from 2016 to 2017 there was a 7.8% increase in the market value of Thailand's cosmetics industry, with the country exporting more cosmetics than it imported (ITA, 2018). This rise in market value was the result of a number of factors including increased population, rapid urbanisation, increased healthcare awareness, product innovation, and increasing demand from emerging

markets (IMARC, 2017; Grand View Research, 2018). Aside from market factors, the Royal Thai government has also driven competitiveness within the country's cosmetics industry (Jinachai, Anantachoti and Winit-Watjana, 2016).

3.5 Sericin Properties in Cosmetics

As shown in Table 3.2, fibroin and sericin consist of 18 amino acids with different proportions of each acid (Tanaka et al., 1999). While sericin is identified by high proportions of amino acids serine (32%-34%) and aspartic acid (14%-16%) (Javali *et al.,* 2015), fibroin contains high levels of glycine and alanine amino acids (Lee, 1999).

Wong et al. (2014) review the properties and use of various types of silk for cosmeceutical and pharmaceutical applications. Similarly, Mondal *et al.* (2007) review the applications of fibroin and sericin proteins as biomaterials for medical purposes.

Table 3.2 The amino acid compositions of fibroin and sericin (values are given as grams of amino acid per 100 g of protein) (Tanaka *et al.*, 1999)**.**

Amino acids	Fibroin	Sericin
Glycine	42.8	8.8
Alanine	32.4	4.0
Leucine	0.7	0.9
Isoleucine	0.9	0.6
Valine	3.0	3.1
Arginine	0.9	4.2
Histidine	0.3	1.4
Lysine	0.5	5.5
Aspartic acid	1.9	16.8
Glutamic acid	1.7	10.1
Serine	14.7	30.1
Threonine	1.2	8.5
Phenylalanine	1.2	0.6
Tyrosine	11.8	4.9
Proline	0.6	0.5
Methionine	0.2	0.1
Tryptophan	0.5	0.5
Cystine	0.1	0.3

Fibroin and sericin's amino acid properties allow them to both be used in cosmetics, but differences in their molecular structure and properties mean they can also be used in a variety of other applications (Nadiger and Bhat, 1985; Daithankar *et al.*, 2005; Huzhou, 2013; Aramwit, 2014; Javali *et al.*,

2015). Both proteins are biocompatible with human skin and it is unlikely they cause allergies in humans (Daithankar *et al.*, 2005; Aramwit, Siritientong and Srichana, 2012).

Padamwar and Pawar (2004) reviewed a range of sericin cosmetic applications. Like fibroin, sericin contains high levels of serine and glycine and these provide its moisturizing management properties (Kato *et al.*, 1998; Padamwar *et al.*, 2005). Sericin is also biocompatible (Aramwit et al., 2012) and displays anti-oxidant behaviours (Zhaorigetu *et al.*, 2003a; R. Dash *et al.*, 2008). Furthermore, it can block UV rays which are one of the causes of skin blemishes and wrinkles (Zhaorigetu *et al.*, 2003b; Rupesh Dash *et al.*, 2008). Additionally, sericin's anti-tyrosinase property inhibits melanin production (Kato *et al.*, 1998; Zhaorigetu *et al.*, 2001, 2003b; Tamada *et al.*, 2004; Dandin and Kumar, 2007; Kumaresan, Sinha and Urs, 2007; Aramwit *et al.*, 2010). Sericin also stimulates collagen in human skin and suppresses nitrite regulation which may induce oxidative stress and cause skin to age (Kitisin, Maneekan and Luplertlop, 2013). However, sericin from different silk strains may have different amino acid compositions and contents and might therefore exhibit different properties (Sarovart *et al.*, 2003).

Sericin soap produced by Thai sericulture community enterprises only use yellow Thai silks as their sources of sericin. With high flavonoids and carotenoids contents, sericin extracted from a variety of Thai silks exhibit anti-oxidant, anti-tyrosinase, anti-allergy and anti-inflammatory properties (Sarovart *et al.*, 2003; Park *et al.*, 2008; Yokohira *et al.*, 2008; Butkhup *et al.*, 2012).

3.6 The Royal Thai Government's Political Support for the Soap Value Chain

Thailand has adopted both Small and Micro Community Enterprise (SMCE) and One Tambon One Product (OTOP) promotion schemes to stimulate the rural economy, fight rural poverty, and alleviate socioeconomic inequality between rural and urban areas through employment opportunities and income generation (Harvie, 2003; Santitaweeroek, 2008; Natsuda *et al.*, 2012; Valeepitakdej and Wongsurawat, 2015). A 'tambon' is a sub-district under a district within a province. Both OTOP and SMCE schemes employ participatory grassroots development strategies and a people-centred

development approach to achieve these objectives (Looney, 2004; Kelly *et al.*, 2012; Chambers, 2013).



Figure 3.23 OTOP logo. Source: (ThaiTambon, 2017)

OTOP is an entrepreneurial stimulus programme managed by the Royal Thai government that functions at a micro level and promotes local Thai products in both domestic and international markets (Kemavuthanon, 2014; Valeepitakdej and Wongsurawat, 2015). This functions as a support programme for SMCE policy. SMCEs need to register their products under the OTOP scheme to get additional government support in terms of product development, business consultancy services, marketing advice, and to allow them to trade with government agencies (MOAC, 2005; Valeepitakdej and Wongsurawat, 2015). OTOP products are identified by the OTOP logo (Fig. 3.23) on their packaging. This logo signifies that a product is indeed a genuine Thai product produced by communities in Thailand (Valeepitakdej and Wongsurawat, 2015). However, despite encouraging locals to utilise natural resources and indigenous skills to expand their community businesses, SMCE and OTOP policies omit environmental conservation from their list of objectives. Very little research has focused on the impact of rural business expansion or how these schemes influence change in local environments. Most research tends to only focus on how these enterprises achieve their socioeconomic objectives (Prasad and Tata, 2010; Ruengdet and Wonsurawat, 2010; SAB Miller, Business Fights Poverty and Harvard Kennedy School, 2016).

OTOP offers financial support to start ups and producers expanding their businesses (Routray, 2007). The core principle of the OTOP scheme is to reduce social and economic inequality and develop self-reliance particularly in Thailand's rural communities. Whether OTOP enterprises would remain sustainable without government support is open to debate (Denpaiboon and AmataAphiwandee, 2012; Natsuda *et al.*, 2012). If not, OTOP might not be helping Thailand achieve its long-term sustainable development goals.

In order to encourage competition and product improvement among OTOP producers, the Thai government has established a 'five star' system of

classification to grade products. Producers of products that receive a higher star rating benefit from additional support in areas like marketing, international trade and financial aid (Kurokawa, Tembo and Velde, 2010; Natsuda *et al.*, 2012). Despite such incentives, the OTOP scheme has resulted in enterprises saturating the market with similar products (Natsuda et al., 2012).

There is a paucity of knowledge about the degree of success of the OTOP scheme. While some objective data exists, the definition of success is essentially subjective and dependent on a variety of factors. Nevertheless, this scheme is known to have helped people with different socioeconomic backgrounds at a variety of ages. It is also proven to have helped provide jobs to those with handicaps and physical conditions. It has also encouraged endogenous growth based on local social capital (Natsuda *et al.*, 2012).

While the poverty rate is known to have decreased nationally alongside the growth of OTOP, SMCEs and other schemes (Prasad and Tata, 2010; Valeepitakdej and Wongsurawat, 2015; The World Bank, 2017), little has been done to examine the extent to which they have impacted inequality in the country. Likewise, the characteristics and impacts of commodity chains produced by these schemes have yet to be considered. Less is understood about the identities, socio-economic backgrounds and characteristics of chain actors, or their relationships. This limits understanding of who benefits and gets exploited within the commodity chain, or why and how this happens.

3.7 Roles of Royal Thai Government Agencies in the Soap Commodity Chain

Four government agencies – the Queen Sirikit Department of Sericulture (QSDS), the Thailand Institute of Nuclear Technology (TINT), the Biodiversity-based Economy Development Organisation (BEDO), and Clinic Technology offices (CT)– are involved in supporting different points of the soap commodity chains in Thailand (Ministry of Science and Technology (MOST), no date b; Haggblade and Ritchie, 1992; Siewsamdangdet, Vemuri and Bretherton, 2010; International Sericultural Commission (INSERCO), 2013; Patichol, Wongsurawat and Johri, 2014b; BEDO, 2016a, 2016b). They operate under three different Ministries – QSDS, under the Ministry of Agriculture and Cooperatives; TINT and CT, both under the Ministry of

Science and Technology; and BEDO under the Ministry of Natural Resources and Environment (BEDO, 2016a; Laoharojanaphand *et al.*, 2016; MOST, 2017, no date). However, less research has examined their roles and impacts in relation to the soap commodity chain. Because of this, the relationships and interdependence between soap chain actors and these agencies are still unknown. Moreover, the complex relationships between these four government agencies and their impact on the soap commodity system is not fully understood. The implications of how the similarities and differences in the support these government agencies provide might impact the development of communities are also unknown. Consequently, there is debate regarding whether any intervention in the soap commodity chain by these agencies would have a positive or negative impact on communities and the environment.

QSDS has a unique position in the upstream soap value chain, as it is the only organisation able to distribute the various kinds of silkworm eggs and mulberries suitable for the local environment. The department has 21 QSSCs that offer low-cost products to members of the public (Fig. 3.24) and prevent private companies from distributing silkworm eggs at market rates (Haggblade and Ritchie, 1992; Siewsamdangdet, Vemuri and Bretherton, 2010; INSERCO, 2013; Patichol, Wongsurawat and Johri, 2014b). This allows farmers to minimise their silk production costs.

QSDS is also the sole distributor of Thai-hybrid silkworm eggs in Thailand, but also sells native Thai silkworm eggs (EU-Thailand Small Projects Facility, 2007). The organisation educates sericulturists by sharing their mulberry and silk production technology and silkworm rearing techniques while developing networking among farmers and private sectors (INSERCO, 2013; Patichol, Wongsurawat and Johri, 2014b). This helps farmers to produce more mulberry leaves and enhance the quality of their silk (Haggblade and Ritchie, 1992; EU-Thailand Small Projects Facility, 2007; INSERCO, 2013; Patichol, Wongsurawat and Johri, 2014b). Additionally, QSDS is the primary organisation supporting the Thai silk industry in terms of innovation of silk-related products, enhancing the value of silk through diversification, and supporting sericulturists and silk markets (QSDS, 2015).

The roles, functions, and contributions of QSDS are normally examined in the context of the sericulture industry, but not extended to diversified silk

value chains (Haggblade and Ritchie, 1992; EU-Thailand Small Projects Facility, 2007; INSERCO, 2013). To add value to the industry, in 2013, QSDS launched a policy to encourage the use of sericin in cosmetics (TINT, 2010; QSDS, 2013). However, no research to date has investigated the department's role in the soap commodity chain, or its impact.



Figure 3.24 A map showing 21 QSSCs located in Thailand, adapted from (U.S. Central Intelligence Agency, no date).

In 2010, TINT used its nuclear research capability to assist QSDS, introducing irradiation methods that produce sericin and fibroin nanopowder for use in Thailand's cosmetics, food, agriculture, and healthcare sectors (TINT, 2010). It also developed a formula to use sericin powder in soapmaking which QSDS sold to the public under the Foundation of the Promotion of Supplementary Occupations and Related Techniques of Her Majesty Queen Sirikit of Thailand (QSDS, 2013). TINT is probably one of the first governmental agencies to share sericin soapmaking methods with local communities (TINT, 2010; Bangkok Focus, 2017). However, the communities TINT supports are geographically diverse, and no research has been conducted to establish the extent to which they have benefitted from this technology transfer. Neither has there been any investigation into the relationships and interdependence between TINT and other Thai government agencies. It is therefore unclear how these agencies, which share the same information and transfer the same soapmaking technology, influence and impact each other (TINT, 2010; Clinic Technology, 2014; Neal, 2014).

Both TINT and BEDO are public organisations, but operate under different ministries (BEDO, 2016a; Laoharojanaphand *et al.*, 2016). They have different responsibilities and perform different tasks (ibid). TINT is responsible for delivering socioeconomic and environmental benefits through nuclear research. It is also responsible for educating the public about nuclear utilisation and otherwise offering its services for the nation's benefit (Laoharojanaphand *et al.*, 2016; MOST, 2017). Whereas BEDO focuses more on empowering local communities to create more value added from natural resources and assisting them in bringing the fruits of the endeavours to market (BEDO, 2014b; PRD, 2016).

TINT and CT are both under the Ministry of Science and Technology (MOST). Despite the similarity in the knowledge they share with soapmakers in rural communities, little research been done to establish any links between these two organisations.

In contrast to QSDS, BEDO, CT and TINT deal with a number of community enterprises that produce and commercialise a range of products (MOST, no date; Chongkum, 2003; BEDO, 2016a; Bangkok Focus, 2017; MOST, 2017, no date). But these three organisations (CT, TINT and BEDO) do not directly focus on sericulture communities like QSDS. However, both BEDO and CT

are among the principal organisations that deliver knowledge and transfer soap production technology to sericulture community enterprises (TINT, 2010; Clinic Technology, 2014; Neal, 2014). Meanwhile, TINT does not seem to have any responsibility in the trading or marketing of community enterprises as it is not part of their tasks (Chongkum, 2003; Laoharojanaphand *et al.*, 2016; MOST, 2017). In spite of government agency engagement with communities in the soap commodity system, less research has examined their relationship and interdependency with these enterprises. Hence, it is unclear whether their relationship is symbiotic.

In 2013, the Clinic Technology programme associated with CT offices was created by the Office of Technology Transfer and Promotion under the Ministry of Science and Technology of Thailand (MOST, no date). The goals of this programme are to create scientific-thinking communities within society that enhance quality of life by improving economic development, reducing expenses, creating jobs, and encouraging higher incomes (MOST, n.d.). As such, they are responsible for delivering knowledge and technology transfer to communities, SMCEs, OTOP producers, Small and Medium-sized enterprises (SMEs) and the industrial sector (ibid).

The Clinic Technology programme collaborates with affiliated agencies and more than 17 educational networks in Thailand, with CT offices set up in a number of educational institutions (MOST, n.d.). The communities it supports are given the title 'Science and Technology Village' and receive training and support for three years to boost their economic activities (MOST, n.d.). After this period, communities can receive an additional two years' support if they pass CT's success criteria. In this case they are promoted to a 'Head of Science and Technology Village' and used as a model for other communities which will learn from their operations and practices. During this additional two-year period, representatives from each village share insights with three other villages that are selected by CT (MOST, n.d.). In 2013, there were 251 Science and Technology villages in 206 districts in 64 of Thailand's 77 provinces (MOST, n.d.).



Figure 3.25 A map of sericulture villages in Thailand which are supervised by CT, adapted from U.S. Central Intelligence Agency (no date). The blue crosses are Heads of Science and Technology sericulture villages and the red crosses are Science and Technology sericulture villages (Interview: Chawalit).

As shown in Fig. 3.25, CT has assisted 16 sericulture community enterprises by providing training and technology based on their specific needs (MOST,

2017). A wide range of trainings has been delivered to these villages which are producing sericin-based cosmetics, using natural dyed colours from plants in silk fabrics, improving techniques in silk weaving and degumming process, using nano-silk fabric technology, and improving product design and packaging. This research focuses on two Heads of Science and Technology villages which produce soap. They are Huaysai Sericulture Community Enterprise in Nakhon Ratchasima province and Nayaw-NaUdom Sericulture Community Enterprise in Buriram province (MOST, 2017). They are supported by two different CT offices at Nakhon Ratchasima and Buriram Rajabhat Universities in Nakhon Ratchasima and Buriram provinces respectively.

Similar to the objectives of CT, BEDO, established in 2007, is a public organisation with the goals of creating employment, enhancing income and providing opportunities for local communities (BEDO, 2016). As it aims to be the principal organisation to propel sustainable biodiversity-based economic development in Thailand, it promotes the use of natural resources for economic purposes, sustainable conservation of biodiversity, and utilisation of local wisdom (BEDO, 2016). This is achieved by supporting community enterprises in creating more value added from their local natural resources and helping them to develop their products and services to meet industry standards and certification (ibid).

BEDO acts as a facilitator, sharing the knowledge and technology that underpin the production of sericin-based cosmetics. It also acts as a soap quality guarantor (BEDO, 2014a; PRD, 2016). Nonetheless, it is still uncertain about the length of the support period which BEDO will supervise community enterprises unlike CT which has a clear framework of their supervision periods (MOST, n.d.). Chumtabong community enterprise in Nakhon Sawan province is the only enterprise BEDO supports that produces sericin-based cosmetics (BEDO, 2014a; PRD, 2016). However, the reason why this is the only enterprise chosen by this agency is unclear. Therefore, it is selected as one of the case studies in this research in order to provide better understanding of the soap commodity system.

To investigates the amount of sericin it contains and guarantee the quality of the soap produced in Chumtabong, BEDO works with researchers from

Charles University in Czechoslovakia (PRD, 2016). However, it does not examine how this affects consumer purchase behaviour.



Figure 3.26 Bio-Economy logo issued by BEDO. Source: (BEDO 2014b)

As indicated by its logo (Fig. 3.25), BEDO has awarded this soap 'Bio-Economy' certification (Fig 3.12) which guarantees that these products pass three criteria: (i) they use local natural resources in their production line and/or local wisdom in their production procedures; (ii) their products must be manufactured in an environmentally-friendly fashion; and (iii) part of the enterprise's revenue is redirected towards conservation and restoring biodiversity in the environment (BEDO, 2014a).

To be regarded as environmentally-friendly manufacturing procedures must i) reduce their use of raw materials, ii) reuse resources, and iii) recycle waste (BEDO, 2014). Enterprises that receive 'Bio-Economy' certification receive additional assistance in a number of areas including promotion, marketing, and sales. They can also leverage BEDO's online distribution channel and its Bangkok store, Fahsai Gallery (BEDO, 2014). In contrast, this kind of environmental certification is not provided by CT, TINT or QSDS.

3.8 Investigating Impacts of Soap Value Chains in Thailand

3.8.1 Socio-Economic Impacts of the Soap Value Chains

The socioeconomic impact of silk production has been analysed far more than other aspects of the soap value chain. As previously mentioned, silk is part of Thailand's identity and linked with its history, culture, and traditions (Singha, 1989; Yoshida, 1999; Earth *et al.*, 2008; Santitaweeroek, 2008; Dewangan, 2013; Dewangan *et al.*, 2013; Marella, 2013; Patichol, Wongsurawat and Johri, 2014b). Silk production helps to enhance Thailand's traditions, identity, and heritage (Brown, 1980; Conway, 1992; Jory, 1999; Earth *et al.*, 2008; Sawasdee, Yodmalee and Phaengsoi, 2015). It also underpins the cultural and spiritual values of silk producers and consumers (Conway, 1992; Wuttakul and Panyura, 1994; Jory, 1999; Earth *et al.*, 2008).

Sericulture helps to empower women and contributes to their role (Singha, 1989; Yoshida, 1999; Earth *et al.*, 2008; Santitaweeroek, 2008; Dewangan, 2013; Eswarappa, 2013). Agrifood Consulting International (2005) shows that in Thailand traditional silk production is normally carried out at the household level by women and the elderly at times when their labour is not needed for other work.

Sericulture and silk weaving are recognised as women's activities (Haggblade and Ritchie, 1992; Earth *et al.*, 2008; Siewsamdangdet, Vemuri and Bretherton, 2010), particularly activities that rural, mature and elderly women engage in (Charsombut and Islam, 1992; Ohno and Jirapatpimol, 1998; Agrifood Consulting International, 2005; Earth *et al.*, 2008). The men in sericulture families tend to be involved in mulberry cultivation, picking mulberry leaves, making tools for rearing silkworms and weaving silk, and feeding silkworms (Siewsamdangdet, Vemuri and Bretherton, 2010).

Haggblade & Ritchie (1992) argue that silk production is beneficial for women who are unable to travel independently and have limited employment options. Silk production gives women the opportunity to generate incomes and also helps them meet their families' needs for ceremonial clothing that is traditionally made of silk.

Dewangan (2013) also suggests that sericulture is suitable for women because many female farmers have been found to rear silkworms alongside doing housework and other duties. It is also considered important for those in rural communities who do not own much land and are poor as a consequence (Dewangan *et al.*, 2013; Stanley and Preetha, 2016). This is particularly relevant to low-income households in the Isan region who face limited economic choices and poor agricultural outputs (Haggblade and Ritchie, 1992).

Earth *et al.* (2008) point out that while cultivating crops like rice and sugarcane offers farmers a yearly income, sericulture allows them to generate a regular income. This helps to alleviate their financial burdens and mitigate the risks inherent in farming. Besides this, sericulture has a positive effect on issues like seasonal outmigration (Earth *et al.*, 2008; Dewangan, 2013).

As stated previously, the sericulture industry provides employment and income generation opportunities, especially in rural communities in the North and Northeast regions of Thailand (Naenna, 1984; Singha, 1989; Haggblade and Ritchie, 1992; Datta, 1996; UNCTAD/WTO, 1997, 2002; Yoshida, 1999; EU-Thailand Small Projects Facility, 2007; Santitaweeroek, 2008; Earth *et al.*, 2008; Kasi, 2009; Dewangan, Sahu and Achari, 2011; Dewangan, 2013; Dewangan *et al.*, 2013; INSERCO, 2013; Stanley and Preetha, 2016). Similarly, soapmaking also provides jobs and incomes, and also reduces the expenses of soapmakers who can sell handmade soaps (Clinic Technology, 2012a, 2013b, 2013a, 2014; Neal, 2014; BEDO, 2016b). However, little is known about the extent to which income from soapmaking addresses farmers' financial needs, or how profits are distributed along the soap value chain. With soap value chain processes mostly hidden, and the identities and the relationships of chain actors unknown, this research argues that there is still limited understanding of the socioeconomic impacts of the soap value chain.

3.8.2 Environmental Impacts of the Soap Value Chains

To date there have been no studies conducted to evaluate the environmental impacts of the sericin soap commodity chain. While the environmental impacts of silk production have been explored in some detail, other parts of the soap value chain have been neglected. Taylor (1980) suggests that both organic and inorganic materials used in soap and detergent manufacturing processes impact aquatic ecosystems and can cause issues like eutrophication, algal bloom, and stagnation.

Francke and Castro (2013) apply carbon and water footprint analysis to soap bars sold by Natural Cosmetics in Brazil. Their assessments cover each stage of the production process, going up to, and including soap consumption. They present the potential impacts of soap consumption with reference to water discharge and water use during consumption. Van Lieshout *et al.* (2015) use a life cycle (cradle to grave) assessment of three kinds of soap: all-purpose cleaners, hand wash and dish soap. They suggest that product formulation, packaging and product disposal, transportation, and water consumption during use are the main sources of environmental impact. They argue that each kind of soap has different impacts on the environment. Similarly, Saouter & van Hoof (2002) also adopt a life cycle assessment to present energy consumption in the production and use of laundry

detergents. They note, however, that consumers' consumption behaviours influence the environmental impacts of such detergents (Saouter and van Hoof, 2002; Van Lieshout *et al.*, 2015).

Mustafa and Ahmed (2014) demonstrate the impacts of industrial soap effluents on people's health in communities in Sudan. However, the study only focuses on soaps produced using a saponification process. They suggest the greywater released during soap consumption is alkaline in nature and can threaten the environment through soil and groundwater contamination and the degradation of vegetative cover. However, the degree to which greywater impacts the environment depends on the amount of water discharged, chemical composition of the greywater dumped, and how it is treated before disposal (Wiel-Shafran *et al.*, 2006; Gross *et al.*, 2008; Eriksson *et al.*, 2009; Misra, Patel and Baxi, 2010; Mohamed *et al.*, 2013). As can be seen, each soap value chain has distinct environmental impacts specific to its use and the processes used in its production and consumption.

In the silk industry, the chemicals used in production processes and improper waste management are potential sources of environmental contamination and pollution (Akter, Rahman and Chowdhury, 1998; Nilvarangkul *et al.*, 2006; Santitaweeroek, 2008; Wani and Jaiswal, 2011; Kumari, Priyadarshani and Varma, 2013; Sittitoon *et al.*, 2015; Subramani and Somasundaram, 2015; Sujatha and Sathish, 2017). While their level of impact depends on a producer's operations and practices, chemicals and waste can negatively impact the health of silk industry workers, their family members, and indeed entire communities (Akter, Rahman and Chowdhury, 1998; Nilvarangkul *et al.*, 2006; Santitaweeroek, 2008).

Vollrath *et al.* (2013) and Astudillo *et al.* (2015) show that high cumulative energy demands make silk a highly resource intensive product that requires more energy to produce than other fibres. Hence, silk has more environmental impact than other fibres. However, this also depends on what kind of silk is produced and how it is produced. Using different production methods, the cumulative energy demands inherent in silk production may differ.

3.9 Summary

This chapter has highlighted how social, economic, political, cultural and environmental factors drive the soap value chain. It has also demonstrated that little is understood about the characteristics of the soap value chain based on its production, trading, and consumption processes. Most studies focus on silk production and little is known about the identities, social status, and lifestyles of sericin soap chain actors, nor have socioenvironmental impacts of the chain been fully considered.

Silk is important to the Thai economy, and to Thai traditions and culture, especially in the North and Northeast regions of the country. The high levels of silk production in Thailand suggest that large amounts of sericin are discarded which can be reused to benefit the country's cosmetic, agricultural and biomedical sectors.

The cosmetic properties of sericin indicate a range of potential applications that silk producers are yet to fully exploit. The Royal Thai government has adopted SMCE and OTOP policies that encourage enterprises to expand their businesses. In the soap commodity system, these policies are promoted by four agencies, the Queen Sirikit Department of Sericulture (QSDS), the Thailand Institute of Nuclear Technology (TINT), the Biodiversity-Based Economy and Development Organisation (BEDO) and Clinic Technology offices (CT). Together these agencies support sericulture community enterprises in such areas as production, marketing, and trade. However, the overall impact of these agencies in the soap commodity chain is unknown. Little is understood about their roles, their connection to each other, or the relationships and interdependencies between these agencies and the various chain actors. There have been no studies to evaluate how the similarities and differences in these agencies might impact rural communities or their growth.

With the assistance of the public sector, soap production has led to job creation and income generation. But it is still uncertain who actually benefits from this initiative and who may be exploited. With the identities of soapmakers and other chain actors hidden, the socioeconomic impacts of the soap value chain are unclear. In addition, the gap in the literature indicates a lack of research as far as the environmental impacts of the sericin soap commodity chain are concerned. Only the environmental impacts of silk

production and other kinds of soap have been properly examined. This research has therefore adopted a ‘Follow the Thing’ approach to addressing these gaps in the literature.

CHAPTER 4-RESEARCH METHODOLOGY

This chapter explains the research methodology adopted to address the aim and objectives of the study. It begins by presenting the philosophical underpinning of the study and goes on to explain the approach to the research. Areas covered include 1) collective case study research methodology, 2) data management, 3) data analysis, 4) assessment of the reliability and validity of the study, 5) research constraints and difficulties, and 6) ethical considerations and 7) risk management.

4.1 Philosophical Approach to the Study: A Pragmatic Worldview

The research employs a pragmatic approach, using research methods and techniques based on what works, in practice, in the field. Creswell (2014) argues that the pragmatic worldview is a philosophy which underpins mixed method studies. In pragmatism, the core concept centres around practical implications. Robson (2011) advocates the selection of philosophies and methodologies that work best for solving research problems and describes the key features of the pragmatic approach—it emphasises the importance of both the natural and social world and shows that it is common for the personal value systems of *pragmatic researchers* to influence what they research, and how they conduct research. Rossman and Wilson (1985) add that researchers must choose analysis methods that are most suited to seeking solutions to their research questions/objectives.

This research chose to employ a collective (or multiple) case study methodology using mixed methods. The researcher determined the methods to be used through consideration of the nature of the research problems, the objectives of the study, the availability of existing data, and the practical limitations she would face in conducting fieldwork.

4.2 Collective Case Study Methodology

Hyett et al. (2014, p.1) suggest that depending on issues like 'research paradigm, study design and selection of methods', the case study can be considered as either a method, or a methodology. When applied as a method, it results in a report that presents a case but omits details on methodology. By contrast, when using it as a methodology, the case study is designed to suit the research question and provide flexibility that other

methodologies might not allow. Depending on a study's research questions or objectives, case study methodology may include single or multiple cases (Stake, 1995; Hyett, Kenny and Dickson-Swift, 2014).

This research benefits from a collective (or multiple) case study methodology, an approach that allows extensive examination of contemporary phenomena in their natural settings (Punch, 2005; Yin, 2009, 2014). Hyett et al. (2014, p.2) state that a collective case refers to 'an instrumental case which is studied as multiple, nested cases, observed in unison, parallel, or sequential order'. Despite this, each case must be studied holistically in its own scope (Stake, 1995).

Case study research involves one or more methods of in-depth data collection (Stake, 1995; Thomas, 2011). A number of studies have suggested that multiple data collection and analysis methods help us to better understand cases that are shaped by context and emerging data (Stake, 1995). This research used a consistent mix of methods to allow comparison across each of the cases included in the research (see Section 4.2.1).

Miles et al. (2014, p. 28) define a case as 'a phenomenon of some sort occurring in a bounded context'. This research defines a sericulture community enterprise as the unit of analysis and focuses on four case studies in small and/or micro sericulture community enterprises in Thailand. The study used the phrases *community enterprise* and *small and micro community enterprise* interchangeably throughout the research.

While there is no explicit formula to determine how many cases should be studied for viable research, it is generally true that the more cases studied, the greater the confidence there is in any findings. Herriott and Firestone (1983) and Yin (2003) concur, explaining that inclusion of a greater number of case studies makes research more robust and produces results that are more compelling. Although a multiple case study has its benefits, a thorough investigation of this sort can be costly and time consuming (Yin, 2003). Such restrictions limit the number of cases an individual can investigate.

Yin (2009) asserts that one major advantage of the collective case study methodology is that it covers contextual conditions that might be relevant

to the research. Yin (2014) goes on to argue that the boundaries between phenomenon and context may not be obvious but notes that one limitation of case study analysis is that case studies 'are not the best method for assessing the prevalence of phenomena' (p.59).

One key benefit of employing a methodology based on analysis of multiple case studies is that the approach assists researchers in terms of identifying and understanding real-life contexts of the phenomena in question and the multiple issues that affect stakeholders' decision-making (Yin, 2012).

Unlike other types of statistical research, case studies are not conducted to produce outcomes that can be generalised across all populations (Thomas, 2011). However, the multiple case study design assists researchers in establishing whether research findings are particular to a single case or replicated in several cases (Stake, 1995; Yin, 2009). This allows them to determine the valuable of findings, and can lead to a more convincing theory based on a range of empirical evidence (Eisenhardt, 1989). Several studies have indicated that case study methodology should be used to recognise the inherent value of findings or provide further discussions from naturalistic generalisations, concepts and theories (Stake, 1995; Ayres, Kavanaugh and Knafl, 2003; Merriam, 2009).

When this research started, there was limited data regarding the location of sericulture community enterprises in Thailand, particularly those that received support for sericin soapmaking from Thai government agencies. As a result, the selection of the case studies included in this research was conducted through literature review and interviews. To determine the locations of communities that might be included in the research, this researcher interviewed officials at four government agencies (QSDS, BEDO, TINT and CT). The lack of a database made it difficult for the officials to provide comprehensive data related to these communities, or suggest the level of support each specific community received. As such, although the list of communities provided by the officials was limited, it could be used for the preliminary selection of case studies.

Four criteria were used to determine which community enterprises should be included in the research: i) they must be part of the sericin soap commodity chain; ii) they must carry out sericulture activities; iii) to ensure their

stability, they must have been operating for at least five years; and iv) they must have registered their business as a *Small and Micro Community Enterprise (SMCE)* under the relevant Thai legislation (DOAE, 2005; MOAC, 2005). The communities that satisfied these four criteria were investigated further to identify potential research gaps. For the community to be selected the researcher first had to obtain the community enterprise head's permission.

The researcher contacted the head of each sericulture community enterprise to gain a deeper understanding of local contexts. The head was considered a 'gatekeeper' who would grant access to enterprise members and other 'locals' in each community. His/her availability during the research period was established, as was his/her willingness to share information. Fieldwork dates and other details were confirmed with the heads once the researcher had checked the safety of each enterprise with the local authorities.

Figure 4.1 presents the locations of the selected case study locations: Huaysai (HS) in Nakhon Ratchasima province (Northeast Thailand); Poethong Charoen (PTC) organic agriculture group in Chiang Mai province (North Thailand); Chumtabong (CTB) community in Nakhon Sawan province (Central Thailand); and Nayaw-NaUdom (NN) communities in Buriram province (Northeast Thailand). Table 4.1 shows the research fieldwork schedule. Figure 4.2 presents the multiple case study procedure adopted by the researcher.

Table 4.1 Schedule of author's fieldwork in Thailand.

Sericulture Community Enterprise	Fieldwork Period
Huaysai	12-26 November, 2015
Poethong Charoen	7-20 December, 2015
Chumtabong	6-16 January, 2016
Nayaw-NaUdom	10-23 February, 2016



Figure 4.1 Map of Thailand's Administrative Divisions (U.S. Central Intelligence Agency, no date). Blue dots have been added to indicate the locations of sericulture community enterprises that produce sericin soap (Note: this data is not exhaustive). Fieldwork was conducted at four sericulture communities in Thailand, and red stars have been added to indicate the locations of the enterprises selected for the research.

The adoption of a mixed methods approach enhances the validity, reliability and credibility of this study. Kirk & Miller (1986) note that conducting fieldwork enables the researcher to gain an in-depth understanding of the target population. Likewise, Long & Johnson (2000) point out that spending time in the participants' environments allows concepts and implications to emerge that help researchers to better understand what participants mean.

The persistent observation and prolonged engagement involved in a case study allow the researcher to build the trust and rapport required to make participants comfortable enough to share information (Lincoln and Guba, 1985; Creswell and Miller, 2000). It also helps the researcher identify gatekeepers and gain access to people and sites. Moreover, the approach allows the researcher to solidify evidence and conclusions by comparing data from observation with that from interviews and literature reviews. With greater insight into the cultures at the study sites, the context of the research problem is also more fully appreciated and better understood.

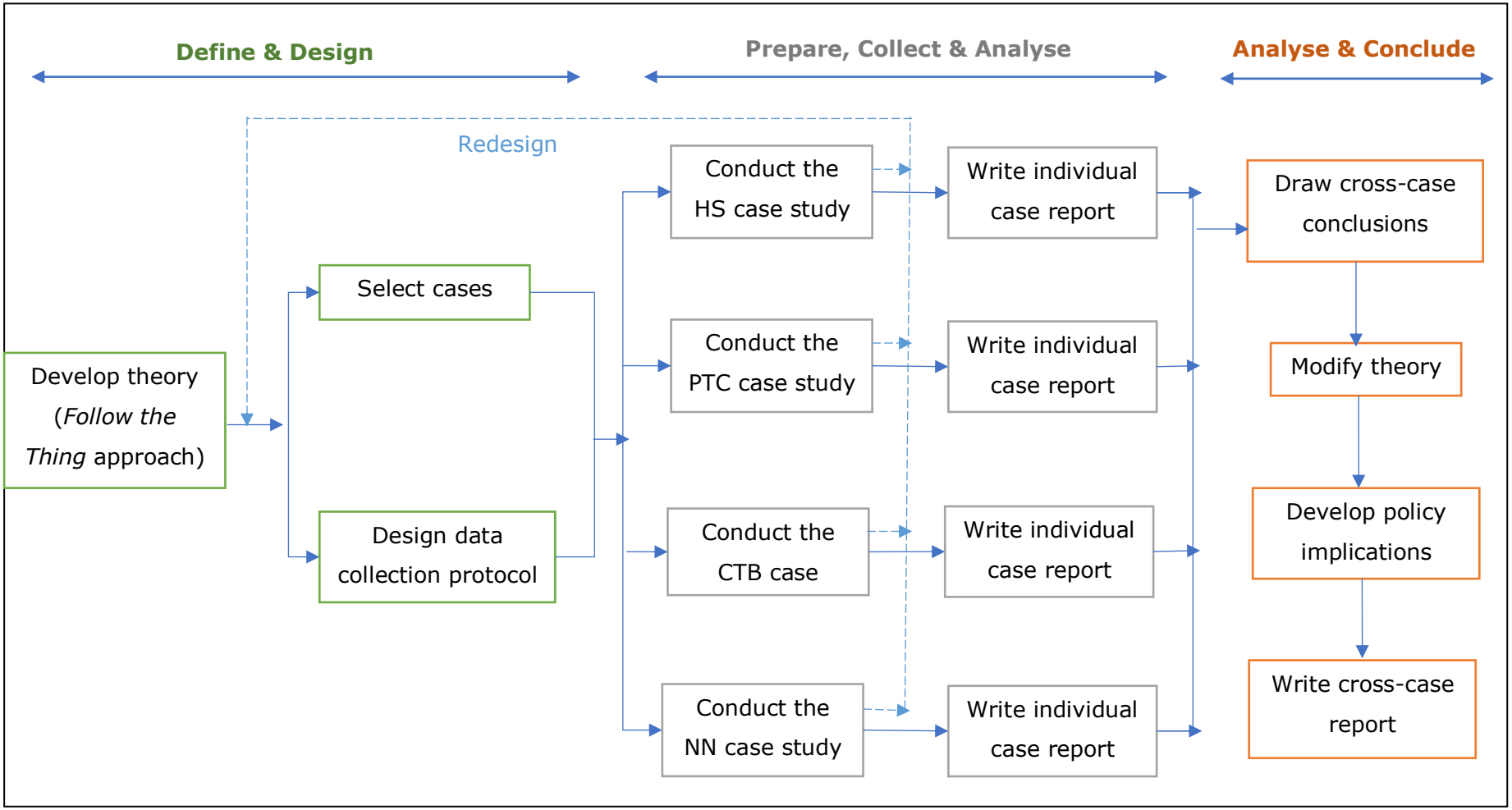


Figure 4.2 The multiple case study procedure used in this study; adapted from Yin (2014, p. 60).

4.2.1 Mixed Methods

This study adopted a mixed methods approach to addressing the research objectives. This approach is a research procedure where both qualitative (open-ended) and quantitative (closed-ended) data is collected. The strengths of both types of data combine to develop a better understanding of the research question than is possible utilising either type on its own (Creswell, 2014).

Applying mixed methods compensates for the weaknesses of each individual method by drawing on the strengths of the others (Johnson and Turner, 2003; Punch, 2005; Creswell, 2014). Knafl & Breitmayer (1991) point out that using mixed methods helps to ensure consistent and reliable results that are explored from multiple perspectives. Morse (2003, p.195) expresses that the major strength of mixed methods is that 'they allow for research to develop as comprehensively and completely as possible'. A mixed methods approach also permits triangulation and the additional corroboration of findings (Greene, Caracelli and Graham, 1989). The ability of the researcher to move from one method to another may uncover contradictions that lead to new perspectives and further clarify results (ibid). Despite such advantages, Creswell (2014) argues that mixed methods are time consuming and require the researcher to be fully familiar with both qualitative and quantitative data collection and analysis.

This study adopted a design of convergent parallel mixed methods for each case study. The researcher collected both quantitative and qualitative data, analysing these separately, and then comparing or relating the results. The research did though predominantly utilise qualitative research methods for each of the cases. This follows Creswell (2014) who notes that a mixed methods study can either emphasise one method over another or equally utilise both qualitative and quantitative approaches.

The qualitative methods used in this research were semi-structured interviews and focus groups prompted using open-ended questions, and both participant and non-participant observations.

Apart from providing information for further investigation, interviews and observations gave the researcher an insider's perspective, providing insights into why individuals thought or behaved the way they did and explaining

their reactions to the matters being discussed. This in turn allowed the researcher to appreciate local culture better.

To complement the interviews and observation, the researcher adopted a participatory rural appraisal method, and used a semi-structured questionnaire to collect socioeconomic data from interviewees (which included details on age, income, marital status, education, and working periods for both primary and secondary occupations (see Appendix 1)). Methods were held constant across all case studies, so data from different cases could be properly and consistently compared.

4.2.1.1 Pilot Tests

Pilot tests of the questionnaires and interview guides used in the research were conducted to establish the clarity of the questions used and assess any practical problems. Fink & Kosecoff (1998) show that pilot tests help to produce a usable survey that assists researchers in getting the information they need, including determining the approximate time it should take to complete the survey. Pilot testing also ensures the comprehension of the questions asked in a survey and thus enhances response rates. To ensure the clarity and focus of this study, pilot testing was conducted before fieldwork commenced.

The questionnaire and interview contents were checked and reviewed by two academic supervisors before fieldwork began. A pilot test was then undertaken with a QSDS official and the leader of Huaysai sericulture community enterprise. They were chosen because of their sericulture expertise and experience of soapmaking as a business.

During each session the interview guide and questionnaire were tested. The participants were also observed to determine how they responded to the questions and how much time was needed to complete an interview. After each session, the officials were asked to reflect on the interview and questionnaire formats. Any difficult or confusing questions were isolated, and the materials were refined to ensure clarity and understanding. Additional questions were also added as required. As presented in Appendix 1 and 2, this process helped focus interview and questionnaire protocols on the target groups. While unnecessary questions were eliminated, others were modified to make them easier for the interviewees to understand.

The focus group interview questions were checked by the heads of the sericulture community enterprises before they were tested with their members. With enterprise members together it became more apparent which topics they may not be familiar with and therefore which questions might not be appropriate for the group. The focus-group interview protocol was subsequently adjusted to suit each target group as presented in Appendix 2.15.

As the QSDS official and leaders of sericulture community enterprises were not independent of the study, it was possible their opinions could influence the direction of the research towards particular issues, areas, and/or individuals. To minimise any potential bias from the pilot test, extensive interviews were conducted with various groups of stakeholders. This helped establish a holistic view of the study and isolate hidden issues that may have previously been overlooked.

4.2.1.2 Participatory Rural Appraisal

Chambers (1994b, p.1437) notes that a Participatory Rural Appraisal (PRA) enables 'local people to share, enhance and analyse their knowledge of life and conditions, to plan and to act'. This allows the researcher to learn directly from locals themselves and promote diversity in the research. It also helps to offset any potential bias. As part of the PRA approach, the research employed 'transect walk' and 'participatory mapping' methods in conjunction with interviews and observation.

A transect walk is typically conducted to gather data while walking along predetermined routes with local people in a community or project area (Van Staden *et al.*, 2006). This approach may result in only certain areas and certain people being included in the data gathering process (Lorenzo and Motau, 2014).

Participatory mapping requires community members to use paper and pens/markers to produce maps that can be used for analysis and discussion. This visual approach allows locals to offer relevant input and can widen participation through the inclusion of people who may be illiterate. PRA is useful in that it successfully complements other research methods (Abbot and Guijt, 1997; Turton *et al.*, 1997). Despite such advantages, participatory mapping may appear unsuitable when it is carried out in or near sensitive,

disputed or protected areas (Henman & Chambers, 2001). PRA also has its critics—Pottier (1992) warns that it can be misleading if interviews are done in a hurry.

PRA was chosen by the researcher who planned to work in close collaboration with each rural community and include some community members in the planning and execution of the research. This 'local' approach improved the data collected in the research and enabled the researcher to understand findings through the locals' perspectives (Henman & Chambers, 2001).

The researcher adopted the transect walk method, walking around the sericulture communities with community leaders and members of the sericulture community enterprises. To gain a deeper understanding of their lifestyles, socioeconomic backgrounds and concerns, the researcher asked a range of open-ended questions during the walk. Questions were asked about their communities, and the sericulture and soapmaking activities carried out in the locals' villages. This helped the researcher to become more familiar with the local communities/people and enabled her to locate and map households and other areas undertaking sericulture and soapmaking activities.

After the walks, the researcher either acquired existing community maps from local district offices or local people, or simply drew maps with the locals. After obtaining and/or drawing maps, selected members of the sericulture community enterprises helped to check their accuracy and highlighted households and areas that carried out silkworm rearing, silk reeling, silk weaving and other sericulture activities, and those where soap production and farming took place.

Data from both transect walks and participatory mapping served as the preliminary step before completing observations and interviews. This helped the researcher to focus on issues relevant to certain groups and observe areas where activities of interest to the research were carried out. This saved both time and budget when the fieldwork began (Henman & Chambers, 2001).

To enhance credibility and ensure there was enough time to obtain and crosscheck the data produced by the research, the researcher stayed with

locals in three villages (Huaysai, Chumtabong and Nayaw-NaUdom) for at least a week. As none of the local families at Poethong Charoen were able to host her during the period of the research, the researcher stayed outside this village and commuted there daily.

4.2.1.3 Interviews

Johnson & Turner (2003) express the idea that the execution of an interview protocol produces in-depth information. Punch (2005) notes that as it offers researchers flexibility and can be used in a wide variety of situations, an interview is one of the most powerful means of understanding others. Interviews represent one of the key methods used in *Follow the Thing* studies that are designed to elicit information and thoughts from chain actors and stakeholders (Cook, 2004; Cook and Harrison, 2007).

As previously mentioned, questionnaires and interviews were conducted simultaneously in this study. As presented in Appendix 2, an interview guide was designed for each group of stakeholders. These included sericulturists, soapmakers, enterprise members who do not produce soap, traders, consumers and non-consumers of sericin soap, locals, leaders of communities and sericulture community enterprises, and government officials.

The individuals and focus groups included in the study received semi-structured interviews with open-ended questions. This encouraged two-way communication and allowed interviewees to express their views openly. It also offered the researcher insights into specific issues of interest to the study. Using questions that had been set beforehand also produced comparable qualitative data (Booker *et al.*, 2014). As presented in Table 4.2, 'convenience', 'purposive' and 'snowball sampling' techniques were utilised depending on the situation and type of participant.

While the researcher carried out in-depth individual interviews both by telephone and face to face, face-to-face interviews were preferred. Face-to-face interviews offered the advantage of allowing the researcher to observe reactions to questions. Observing social cues that involve voice, intonation and body language helped the researcher gain additional insights into the interviewees' characteristics, behaviours and identities (Opdenakker, 2006). This was especially useful when respondents were illiterate, blind or

becoming old (Bernard, 2006). Despite any advantages, Henn et al. (2006) warn that face-to-face interviews may lead to biased responses with respondents giving answers they believe the interviewer would like to hear. Additionally, the travel involved in reaching respondents makes the approach time consuming and costly (Bernard, 2006). These issues were taken into consideration when conducting the interviews.

Where necessary, some of the 'follow-up' interviews included in the research were conducted by telephone. Telephone interviews allow researchers 'to draw sample with greater accuracy' and get quick responses due to technological advances (Henn, Weinstein and Foard, 2006, p. 128). As they allow the interviewer to reach respondents in a wider geographical area, telephone interviews also reduce travel requirements and cost. They also improve interviewer safety as there is no need to be in the same physical location as those being interviewed (Aday and Cornelius, 2006; Bernard, 2006).

While the absence of the visual cues and contextual and nonverbal data available in face-to-face interviews may lead to data loss or distortion (Groves, 1990), telephone interviews do generally allow respondents to disclose sensitive information (Opdenakker, 2006). However, there are some potential drawbacks. As they may lead to low response rates, telephone interviews may not be suitable where researchers or participants have limited access to telephones (Aday and Cornelius, 2006; Bernard, 2006). Additionally, people interviewed by telephone tend to be more suspicious of the interview process. The medium might therefore drive more socially appropriate responses than face-to-face interviews would (Holbrook, Green and Krosnick, 2003). Nevertheless, this approach did though help the researcher build trust with respondents and gain more access to data at a range of sites. This in turn allowed her to gain deeper understanding of the complex issues being investigated. Ultimately, data from both telephone and face-to-face interviews can be used productively in qualitative research (Sturges and Hanrahan, 2004; Stephens, 2007).

Table 4.2: Interview sampling techniques used for each type of participants

Type of participants	Interview technique(s) used
48 enterprise workers who produce or do not produce soap	• Purposive sampling • Snowball sampling

23 local residents	• Convenience sampling • Snowball sampling
14 government officials	• Purposive sampling
15 sericin soap traders	• Purposive sampling • Snowball sampling
11 consumers of sericin soap	• Convenience sampling • Purposive sampling • Snowball sampling
8 non-consumers of sericin soap	• Convenience sampling • Purposive sampling
8 Leaders of local communities and sericulture community enterprises	• Purposive sampling
5 focus groups with sericulturists and soapmakers	• Purposive sampling • Snowball sampling

All interviews lasted from 40 minutes to 1.5 hours, depending on the topics discussed and how well interviewees could answer the interview questions. The interviews were also recorded when interviewees gave their consent (audio only). In cases where consent was not given, the researcher made a note of the key points of each interview and produced detailed notes upon completion. In this study, the number of interviewees at each community enterprise varied and often depended on whether information redundancy and/or theoretical saturation had been achieved. Data collection ceased when it became repetitive (information redundancy) and/or offered no new insights or themes (theoretical saturation) (Glaser and Strauss, 1967; and Charmaz, 2014).

Tables 4.3, 4.4, and 4.5 summarise the number of interviews at Thai government organisations, sericulture communities, and consumption sites. A total of 103 interviews were conducted. As the interviewees were selected randomly (or selectively) and the number of interviewees at each community varied, results were strongly indicative, but by no means exhaustive.

Table 4.3 Summary of numbers of interviews at Thai government organisations

Organisation	Number of interviews
QSDS	5
BEDO	2
Ministry of Science and Technology	3
Local authorities	4
Total	14

Table 4.4 Summary of numbers of interviews at sericulture communities

Community	Number of interviews
Huaysai	28
Poethong Charoen	8
Chumtabong	19
Nayaw-NaUdom	15
Total	70

Table 4.5 Summary of numbers of interviews of sericin soap consumers

Consumer type	Number of interviews
Sericin soap Consumers in Thailand	11
Non sericin soap consumers in the UK	8
Total	19

The limited number of participants in the study meant the research typically adopted convenience sampling techniques when purposive and snowball sampling techniques could not be applied. Henn et al. (2006) and Onwuegbuzie & Collins (2007) define the convenience sampling technique as choosing samples that are conveniently available and participants who are willing to participate in research. Difficulties estimating how representative a sample might be (Henn, Weinstein and Foard, 2006) and issues related to determining the bias of a sample (Anderson, 2010) sometimes mean this approach is not as robust as others. Nonetheless, it proved helpful to this research.

Convenience sampling techniques allowed the researcher to investigate issues in a more holistic fashion, and this led to additional insights and further investigation using other research techniques and methods. It also helped the researcher to better understand the perspectives and characteristics of people from various backgrounds in the areas of interest (Anderson, 2010). Besides this, the technique eased the data collection process by helping the researcher establish connections with people in a variety of areas. It furthermore assisted in highlighting data saturation, which proved valuable to the qualitative aspect of the study (Etikan, 2016).

The research also included snowball sampling. This approach allowed the researcher to develop a network of respondents from an initial group of informants in the same population. Henn et al. (2006) argue that this technique is suitable when it is difficult to establish samples from groups that are difficult to approach. As the researcher decides who to interview, snowball sampling is also a very purposive sampling technique (ibid). In this

research the technique offered insights through interviews with groups that were unknown to the researcher. The technique also gave stakeholders the opportunity to express their viewpoints on matters which might or might not affect them. As a result, more inclusive and relevant data was produced.

This research also utilised the purposive sampling technique when key informants were able to provide information on a topic of interest (Miles and Huberman, 1994). This method is useful for generating ideas and providing in-depth information without carrying out full-scale anthropological investigations (Khan *et al.*, 1991). It is 'inexpensive, data-rich, flexible, stimulating, recall-aiding, cumulative and elaborative' (Punch, 2005, p. 171). Collins (p. 360) states that data obtained from purposive sampling can be generalised to the sample by 'analytic, case-to-case transfer, and naturalistic generalisations'. However, problems related to group culture and dynamics, including balancing the group interaction, can emerge from this method (Fontana and Frey, 1994), and sample selection may introduce bias and subjectivity, which would problematise generalisation to larger populations (Khan *et al.*, 1991).

The analytic generalisations proposed by this study were developed by leveraging the evidential quality of the data collected and drawing analytic conclusions. Focus groups were carried out as a rapid assessment of the issues important to the study and the purposive sampling technique helped to identify key informants. Each focus group was selected by purposive and snowball sampling techniques and consisted of about 3-10 individuals, each a member of the sericulture community enterprises that produced silk or soap. The focus group interviews were carried out in person and typically lasted for about 1-1.5 hours. As discussed in Section 4.5.1, to reduce bias and address any potential pitfalls inherent in the approach, the study used a variety of methods and techniques to apply data triangulation.

4.2.1.4 Observations

The researcher employed both participant and non-participant observations to collect data about the interactions between the people in the areas of interest within their cultures. The observations also established the arrangement and organisation of their priorities in relation to a wide variety of activities.

DeWalt & DeWalt (2011) assert that observations assist in developing a holistic understanding of the case study and improve the validity of the research. Creswell (2014) suggests that observations allow researchers to gain first-hand experience with participants and to notice unusual areas that contrast with other evidence. Likewise, Johnson & Turner (2003) point out that observers can objectively assess behaviour and contextual factors in their natural settings.

Observations are commonly used in *Follow the Thing* studies to better understand chain actors' behaviours and practices (Cook, 2004; Cook and Harrison, 2007). However, Creswell (2014) argues that researchers may be perceived as intrusive which limits the extent to which data can be obtained. Likewise, some private information observed cannot be reported due to the considerations of ethical and safety issues. In addition, observers bring interests and preferences to an observation, and as such their presence might influence results. Likewise, dwelling on specific areas of interest and overdependence on particular informants might produce biased results (Munck and Sobo, 1998; Johnson and Turner, 2003). To reduce bias and gain a better understanding of chain dynamics, this research observed a range of activities at different points in the soap value chain. Likewise, a variety of stakeholders were observed in a variety of locations.

Participant observations took place during silk and soap production. In addition, commercial activity that took place where producers lived and at government fairs was also observed. The researcher also produced and sold soap alongside members of sericulture community enterprises.

Non-participant observations occurred when the researcher observed the daily routines of local residents, soapmakers, community enterprise traders, and sericulturists. Their routines included sericulture and farming activities alongside soap production and commerce. Data recorded from observations took the form of photographs and field notes.

4.2.1.5 Questionnaires

Inexpensive and offering a quick turnaround time, the use of questionnaires can help provide explanations for some complex social phenomena (Johnson and Turner, 2003). While it is true that questionnaires can at times miss

certain data, well-constructed and well-tested questionnaires can produce extremely valid results (Johnson and Turner, 2003).

The questionnaires used in this research featured both closed-ended and open-ended questions and were designed to determine the specific attributes of those interviewed (Henn et al., 2006). They were also used to gain an understanding of the informants' more general characteristics and understand any other relevant contextual information (Johnson and Turner, 2003). Depending on the interviewees' literacy levels, the researcher would either ask participants to complete questionnaires themselves, or provide assistance as required.

The research questionnaires helped the researcher to better understand the backgrounds of those involved in the study. The researcher was also able to consider any patterns in the results of participants with various socioeconomic backgrounds. Likewise, she was able to choose more relevant questions during interviews. Typically, questionnaires and interviews were conducted simultaneously.

4.3 Data Management

This section discusses transcription and translation of collected data.

4.3.1 Transcription

This study required audio recordings of interviews be transcribed to produce verbatim written texts (c.f. Poland, 1995). Halcomb *et al.* (2006) note that verbatim transcripts benefit third party audit trails by supporting data analysis and helping researchers get closer to their data. Lopez et al. (2008) suggest that verbatim transcription is critical to qualitative analysis as it helps to capture the richness of participants' stories.

This study did not include nor interpret non-verbal communication or the emotional context of what the interviewees said. Interviews were conducted in either Thai or English; this depended on the spoken language of interviewees. An hour-long interview normally required about 3 to 4 hours of transcription. The researcher transcribed each of the English interviews and some of the Thai interviews. To speed up the transcribing process three native Thai research assistants helped transcribe the other Thai language interviews.

To ensure the accuracy and consistency of transcriptions, the researcher carefully selected and personally trained the other transcribers. Emphasis was placed on ensuring that they understood the need for an exact reflection of what had been said during the interviews. Likewise, they were monitored to ensure their work remained consistent throughout. To highlight the level of accuracy required and give transcribers the opportunity to ask questions about procedure and other issues, each was given an example of a transcript that a researcher had produced based on a sample audio recording (which they also received).

To ensure rigour in qualitative research, the trustworthiness of transcriptions must be properly established (Poland, 1995), and this means eradicating error. There can be several reasons for errors in transcriptions. Misinterpretation of content can be based on simple issues like language inaccuracies, or more complex concerns like differences in class or culture (Easton, McComish and Greenberg, 2000; MacLean, Meyer and Estable, 2004). To eliminate errors, the interviews transcribed by the research assistants were reviewed by the researcher. To determine accuracy, every 15 minutes of a recording, one minute of interview content was compared to the relevant part of the transcription.

To make the transcripts more readable, they were also edited to remove repetition and 'filler' words like 'umm' (Bailey, 2008). In addition, to make the transcripts more broadly understandable, any vocabulary or phrases related to a specific dialect were changed into standard Thai.

4.3.2 Translation

Filep (2009, p.69) expresses that 'translation is the translation of text from a source language into a target language'. He argues that in translation it is more important to interpret cultural meaning or national concepts that a certain language carries than to produce a strict literal rendering. Al-Amer et al. (2015) concurs that semantic and content equivalence should be given priority over word-for-word translation. This is because semantic equivalence provides the overall meaning and is useful when there is no equivalent meaning for words (Temple, Edwards and Alexander, 2006; Larkin, Dierckx de Casterlé and Schotsmans, 2007).

To ensure the overall rigor and auditability of the research and guarantee the integrity and reliability of the findings in this research, a transparent and systematic approach to the translation process was adopted (Al-Amer *et al.*, 2015). To maintain semantic and content equivalence, a 'semantic translation' technique was applied to all Thai transcripts translated into English.

As a native speaker of Thai and fluent in English, the researcher was responsible for translating each of the Thai transcripts into English. Temple & Young (2004) show that cross language data analysis is suited to researchers who translate themselves, and this approach was adopted as part of the translation procedure. This helped to maximise the reliability of the data and maintain the consistency of translation (Twinn, 1997).

The researcher spent much of her life in Thailand and has spent an extended period in the United Kingdom. As such, she is familiar with Thai and British cultures and has a solid grasp of the nuance involved in translating Thai to English. Al-Amer *et al.* (2015) suggest that translators who are acquainted with the cultures and values of a group can assist in contextualising narrations related to that group. Moreover, as it facilitates generation of comparable versions of both languages, they show that it is desirable for a translator to be both bilingual and acquainted with the study area. Likewise, Filep (2009) demonstrates that knowledge of history, culture, and social aspects of the language they translate prevents communication problems and ensures the reliability of any translated information.

4.4 Data Analysis

This research followed a protocol designed by Creswell (2014) for data analysis in qualitative research as presented in Fig 4.3. Analysis of the qualitative data was carried out by 'coding' interviews and observation data (Wolcott, 1944; Creswell, 2014; Creswell and Poth, 2017). 'Themes' for analysis were drawn from patterns in the codes. Any thematic connections were then presented under the same 'category' and analysed within each case study and across case studies.

Codes and themes were derived from both predetermined sources (literature reviews) and emergent information (fieldwork). The predetermined codes and themes for each group of interviewees are presented in Appendix 2.

Appendix 3 details derivation of themes and codes emerging from an interview and shows how these themes and codes emerged from fieldwork.

Questionnaires conducted by each group of chain actors were analysed separately and used as supplementary data for qualitative analysis. Analyses of individual case studies were subsequently compared across the cases. The results were then compared to the literature (to draw conclusions that relate to the literature) and extended to address previously identified research gaps.

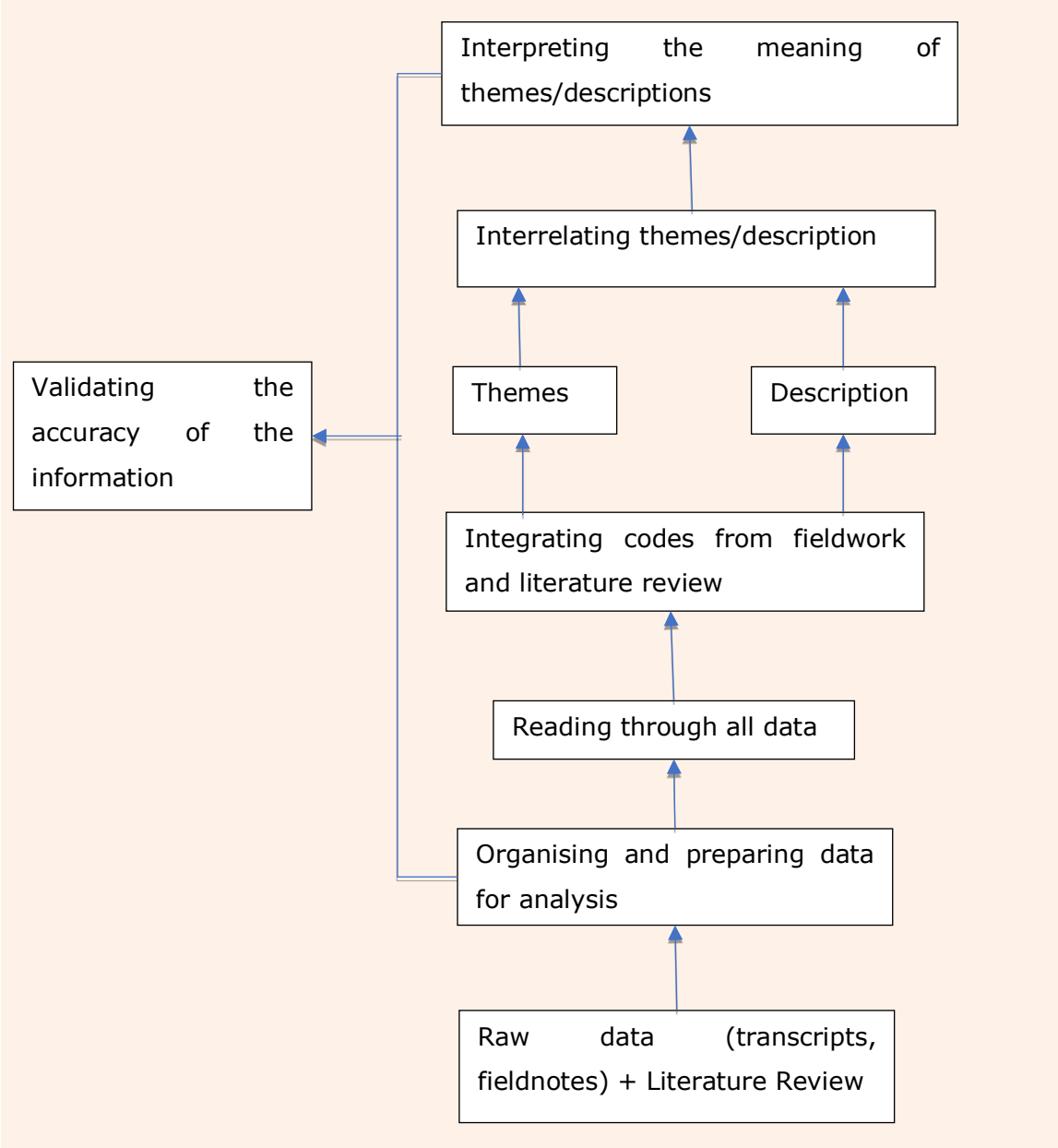


Figure 4.3 Data Analysis in Qualitative Research adapted from Creswell (2014, p. 197).

This research employed both 'etic' and 'emic' approaches to understanding data collected at various groups which may have distinct cultures. The emic (or 'insider') perspective was designed to understand culture from 'the native's point of view'. This was done by asking interviewees open-ended questions that would allow them to elaborate on the issues and reflect their 'self-understanding' (Goodenough, 1970; Morris *et al.*, 1999). Likewise, participant and non-participant observations were also carried out to gain a better understanding of their behaviours (Goodenough, 1970). This helped the researcher to appreciate what people thought and why they acted in the way they did.

The etic (or 'outsider') perspective was utilised to link cultural practices to external, antecedent factors such as economic or ecological conditions that may not be important to cultural insiders (Harris, 2001). This was done to compare stakeholders' perspectives and included doing observations and conducting interviews at several cultural groups in various locations (Morris et al., 1999). As such, it helped to illustrate the influence of cultural setting on other variables (Morris et al., 1999).

This research substantiates Morris et al's 1999 publication integrating the use of both etic and emic approaches. Both etic and emic insights helped to gain holistic views of the characteristics and behaviours of stakeholders in the soap commodity system. Using this integrated approach also helped to avoid the downfalls of the individual approaches to conceptualising culture and cognition during data analysis (Morris *et al.*, 1999).

4.5 Reliability and Validity of the Study

As it applied mixed methods, the reliability and validity of both the quantitative and qualitative approaches must be addressed to ensure the rigour of this research.

Reliability is described as the consistency or the stability of data collection measures (Hammersley, 1992; Long and Johnson, 2000). Long & Johnson note that reliability indicates confidence in data collection. Reliability in qualitative literature is described as the trustworthiness (Glaser and Strauss, 1967), consistency (Hammersley, 1992) and dependability (Lincoln and

Guba, 1985) of the evidence. Reliability thus emphasises the soundness of a study (Ritchie and Lewis, 2003).

The validity of research is constructed when 'it represents accurately those features of the phenomena that it is intended to describe, explain or theorise' (Hammersley, 1992, p. 69). This thus requires examination of the quality of the evidence that supports the claims. In qualitative research, validity is also described as credibility (Guba and Lincoln, 1989) and adequacy (Hall and Stevens, 1991).

The only quantitative data in this study was provided by the questionnaire. The validity of a questionnaire is determined by assessing whether it measures what it is intended to measure (Tsang, Royse and Terkawi, 2017). This research used 'face validity' to ensure the credibility of the data the questionnaire produced. This was achieved by asking two Ph.D. students to review the questionnaire and assess its acceptability at face value. Mosier (1947) notes that a test protocol is valid when it seems to serve the objective of the test. As such, statistical evidence of validity is not required. Greco et al. (1987) conclude that face validity is vital for both the pre-test and the final product as professional-looking questionnaires have tendency to draw more serious responses.

The reliability strategy used for the research questionnaire was pilot testing (Chanakit, 2016). Studies show that the selection of experts who can assess the clarity, comprehensiveness, readability and appropriateness of a questionnaire is crucial (Tsang, Royse and Terkawi, 2017). To ensure that its content was appropriate and able to meet the objectives of the study, the questionnaire in this study was reviewed by two academic supervisors who were familiar with its construct and related research contexts.

The questionnaire was also reviewed by a QSDS official and the leader of Huaysai sericulture community enterprise. Both were familiar with the study and determined its suitability for the level of interviewees it was intended for. They were also asked to determine the suitability of the questions and asked to ensure only 'required' questions were included. One drawback to this process was the subjectivity of the two 'experts' (Bolarinwa, 2015; Tsang, Royse and Terkawi, 2017). To ensure the reliability and validity of

the questionnaire, their input was received alongside face validity procedures.

As mentioned in Section 4.2.1, qualitative research made up the bulk of this study. Creswell & Poth (2017) state that at least two validation strategies should be applied to qualitative research to ensure the validity of its results. This research employed a number of strategies to check the accuracy, trustworthiness and credibility of its findings (Noble and Smith, 2015). These strategies included data triangulation (Section 4.5.1), participant feedback (Section 4.5.2), and a consideration of the researcher's positionality and reflexivity (Section 4.5.3).

4.5.1 Data Triangulation

This research incorporated the views of underrepresented actors in the soap commodity chain and this approach provided one of the study's main sources of data. Although the participants' thoughts, actions and feelings may create inconsistency, this does not invalidate their perceptions (Hall and Stevens, 1991). Rather, their reflections could help the researcher to appreciate the diversity of opinions in a study which may be influenced by participants' genders, cultures and environments. Hall & Stevens (1991, p. 21) state that a study establishes credibility when 'it presents such faithful interpretations of participants' experiences that they are able to recognise them as their own'. In this case, participants provided their own standards of validation (ibid).

To ensure research credibility and objectivity, gain confidence in research findings and establish its validity, the interview data was crosschecked with observations, questionnaires and literature reviews (Jick, 1979; Lincoln and Guba, 1985; Knafl and Breitmayer, 1991). Jick (p.603) points out that triangulation of this nature helps to provide a 'more complete, holistic, and contextual portrayal' of the study.

Data triangulation allowed the researcher to treat the data as a whole rather than fragmenting it, and this in turn enabled the researcher to identify emerging themes (Anderson, 2010). Likewise, the constant comparison of data served to reduce researcher bias (ibid).

Data triangulation was carried out because some of the interviewees' opinions were incomprehensive and did not actually represent the reality of certain situations. To get holistic perspectives of the issues and identify issues which had not been examined in the literature (and therefore represented gaps in the literature), interviews and observations were conducted with various groups of stakeholders and the results triangulated with data from other methods to establish consistent results (Jick, 1979; Creswell and Miller, 2000; Creswell, 2014).

Although it helps to reduce the disadvantages of each individual method, time and cost constraints may prevent effective use of data triangulation. In addition, research that applies triangulation is recognised as being difficult to replicate (Jick, 1979; Long and Johnson, 2000).

4.5.2 Participant Feedback

Follow-up telephone interviews were carried out to check feedback on research findings and to correct errors of fact with key participants. Checking participant feedback is the most important technique to establish credibility as it allows respondents to declare the validity of what has been found (Lincoln and Guba, 1985; Long and Johnson, 2000).

4.5.3 Positionality and Reflexivity of the Researcher

Palaganas et al. (2017) point out that when conducting research, it is impossible to remain detached from one's study. The concept of reflexivity acknowledges that a researchers' orientations, roles, and identities—shaped by their socio-historical locations including values, assumptions, interests, origin, and gender—affect their research practice (Hammersley and Atkinson, 2007; Castagno, 2012; Creswell, 2014; Palaganas *et al.*, 2017).

Creswell & Miller (2000) present that the researchers' reflexivity allows readers to understand their positions. Finlay (2002, p.211) points out that this helps to 'enhance the trustworthiness, transparency and accountability' of the research. Likewise, Ritchie & Lewis (2003) suggest that reflexivity is necessary in achieving objectivity and neutrality when conducting qualitative research.

I, the researcher, am a native Thai woman from the North of Thailand. I am accustomed to both eastern and western cultures because I have lived both

in Thailand and in the United Kingdom. As a result, I may be perceived as both an insider (who understands Thai culture and traditions) and an outsider (who is not resident at any of the study sites nor a member of any participant group).

Ergun & Erdemir (2010) present that researchers who are both insiders and outsiders are in a fluid state, which leads neither to inclusion nor to exclusion. Likewise, Dwyer & Buckle (2009, p.61) note that researchers can only occupy the space between the insider and outsider positions as 'they cannot fully occupy one or the other of those positions'. They highlight that using a dialectical approach allows one to appreciate the complexity of human experience. In addition, this helps researchers to negotiate their identities at multiple levels in reference to commonalities and differences. Ergun & Erdemir (2010) point out that this helps researchers to fulfil the expectations of natives, address concerns related to maintaining neutrality, and deal with diverse political preferences.

It is important to recognise that my experience of British and Thai cultures and my position as a Thai female researcher might have influenced my values and judgement. This in turn might have influenced my leanings toward a specific issue or area. As such, it is possible that I focused on a particular area more than another researcher in a different situation, and with a different background, might have done. Likewise, my presence might have influenced research participants to behave differently to their true natures and could potentially have impacted the amount and quality of participant feedback the study received. Such influence could potentially have affected the direction of the research and impacted the results and conclusions it presented.

As I was female, Thai, and researching a topic that involved mainly female Thai sericulturists, soapmakers and community enterprise traders, the research participants were comfortable in my presence, and this made them more willing to share information. As a native Thai, sharing the same culture, the participants were able to perceive me as being part of their particular group, and ultimately regarded me as an 'insider'. Kanuha (2000) points out that being a researcher who is regarded as an insider offers a level of understanding of a population that may not be available to an 'outsider'. However, although regarded as an insider, my role was also that of an

outsider. As such, I was not immersed in the local culture and context and could easily recognise and remark on the locals' lifestyles and patterns of living. Being an outsider enabled me to elicit information about why the locals behaved the way they did, and why things were done in a certain way. Fay (1996) shows that being an outsider of the group allows one to see through complexity and appreciate perspectives more than one who is part of the experience.

As I was Thai and conducting research in areas related to aspects of Thai government activity, several government organisations were willing to give me access to the information the study required. As the study focused on an activity that received government support, stakeholders were also willing to participate in the research. I found that when I conducted interviews with government officials I tended to be perceived as someone who was trying to understand the business better, not as an expert in the trade. As such I was perceived as either an insider or outsider. Being an insider would mean me being regarded as a Thai researcher who has some background knowledge in case studies and who was attempting to understand an issue more deeply, whereas being an outsider would mean me being considered someone who was not a part of the Thai government. How beneficial this was depended on the type of information being collected. The willingness of those involved to provide information also depended on issues like their personalities and other factors outside of my control.

Despite the distinct position between an insider and outsider, Merriam et al. (2001, p.415) state that 'what an insider sees and understands will be different from, but as valid as what an outsider understands'. Similarly, Lewis (1973) also presents that perspectives of both insiders and outsiders must be accepted as legitimate because the study of people should be perceived through multiple perspectives, which are necessarily influenced by interests and needs. Thus, playing both roles did not inhibit my understanding of the subject matter but rather allowed me to appreciate the complexity of issues from various angles.

To minimise the effects of positionality, the objectives of the study were presented to all participants beforehand. In addition, I also tried to gain the participants' confidence and trust by being as transparent as possible about the research procedure and my own background. In addition, to minimise

the effect of being an insider, my research explicitly reflected and addressed the relationship between myself and the participants in this study. Likewise, I also provided the reflexivity of the study, and collected data from different respondents and locations to minimise bias (Bonner and Tolhurst, 2002). Furthermore, I attempted to minimise the effect of being an outsider by trying to blend in with the locals, participating in their activities, and always being sure to respect their opinions and practices (ibid). I also chose multiple case studies to get more holistic perspectives of stakeholders in the soap commodity system and better understand the effects of cultural affluence on chain actors' behaviours.

4.6 Research Constraints and Difficulties

Data collection for this research was constrained by communication difficulties. The locals in the Northeast region of Thailand use a dialect that is quite different from the Thai spoken in the central part of the country. As the researcher was not familiar with the area, or the local dialects, communication proved difficult at first. After interacting with the locals for around a week, the researcher began to understand and communicate using the local dialects. This helped the interviewees feel at ease when offering their input.

As it took place during the harvest period, this study was also constrained by the limited number of participants available during the fieldwork. Male farmers were busy on their farms and most were not at home during the daytime. Those who were at home included middle-aged to elderly women who were involved in tasks like weaving silk, producing handicrafts, and taking care of their children and/or grandchildren. For safety reasons the researcher only scheduled interviews and observations during daylight hours, and this limited the study to the opinions of those available. As a result, the input received might not have been representative of all populations.

4.7 Ethical Considerations and Risk Management

The research addressed a number of ethical issues that emerged while planning, executing fieldwork, analysing data, and reporting data. Israel & Hay (2006) note that researchers have an obligation to protect those involved in their research. To promote research integrity, they must gain the

trust of the participants and prevent any possible misconduct against them and/or their organisations.

This study met the requirements of the University of Nottingham's 'Code of Research Conduct' and the researcher followed the university's ethical guidelines, risk assessment and practices throughout. The researcher also sought the approval of the heads of the sericulture community enterprises and community leaders before approaching the local communities to collect data. Likewise, the researcher went through appropriate channels before being granted permission to conduct research at the five Thai government organisations involved in the research.

The researcher made every effort to be respectful and adhere to proper standards of behaviour during interviews and observations. This included carefully explaining her position and explicitly stating the purpose of the research. Most importantly, it included securing consent before data was collected. All participants were asked to sign written consent forms that allowed the information they provided to be used for academic purposes. Should they have wished to, they had the right to omit their names and any information they did not wish to disclose. In such cases personal information would be masked. To protect their privacy their faces would be blurred on photographs and they were given alternative names by which they were referred to. The participants' data was never shared with any third party and it was stored securely at all phases of the research. Issues of confidentiality were also addressed. Any information that may be harmful to individuals was omitted from public disclosure. The informants' personal information was not shared with the research assistants involved in the transcribing process. In addition, these assistants were forbidden from sharing or using any of the transcribed information without permission. Importantly, data and personal information were used with caution. Once this thesis is published, copies will be given to participants and stakeholders.

To ensure that the researcher was aware of potential risks and understood how to minimise them, a risk assessment form was approved by the University of Nottingham before fieldwork was initiated. The researcher's father accompanied her to the research sites and stayed with her while she was onsite. This ensured her safety and her ability to reach areas which might not have been possible without an escort. Data collection only took

place during the day and interviews and observations were conducted only at places that were considered safe.

Before making fieldwork visits, officials at local municipal district offices gave the researcher a general background to the safety of each study site. On some occasions, the officials visited the villages with the researcher and introduced her to the residents. This served to gain their trust and to establish an official/semi-official framework for the research.

4.8 Summary

This chapter provides details of the methodological approach used in this study. Using a pragmatic worldview, the study meets research objectives by adopting a collective 'mixed methods' case study methodology. The rigour of the research—in terms of data collection, data management, and data analysis—was established by conducting validity and reliability checks that utilised data triangulation, participant feedback, and positionality and reflexivity of the researcher. Furthermore, it covers any constraints and difficulties experienced during the study and addresses ethical considerations and risk management.

CHAPTER 5-CASE STUDIES

This chapter provides an overview of Thailand, in terms of its geography, economy, environment, ethnicity and climate, and covers the history of the sericulture community enterprises included in the research case studies and the backgrounds of community members.

To identify specific regions within Thailand, this research adopted the 'six-region classification system'. This system is standard for geographical and scientific purposes and recognises six specific regions within the country: North, Northeast (known as 'Isan'), Central, East, West, and South. It differs from the 'four-region system' which is predominantly used in administrative contexts and only identifies the North, Northeast, Central, and South (Verlagsgesellschaft, 1981; Central Intelligence Agency, 2015). In the six-region classification system Nakhon Sawan is considered part of the Central region, whereas in the four-region system it is considered part of the North region.

5.1 Overview of the Geography, Climate, Ethnicity, and Local Economies in Thailand

Thailand is situated in the centre of the Southeast Asian peninsula, and its capital is Bangkok. The total area of the country is around 513,116 km^2 and its population is 67.7 million (World Bank, 2016). The country consists of 77 provinces and is divided into the six geographical regions (mentioned above) based on natural features, population, and land use. (Verlagsgesellschaft, 1981; Central Intelligence Agency, 2015).

Based on ethnicity, about 75% of Thailand's population is ethnic Thai, and 14% of Chinese descent (Australian Educational International, 2013). Apart from using standard Thai (the dialect of the Central region) as its official language, each region and ethnicity has its own dialect (Australian Educational International, 2013). 96.4% of the Thai ethnic group are Buddhist (Australian Educational International, 2013)

Each region of Thailand has distinct topographic features. As illustrated in Fig. 5.1, most areas in the North region are hilly, mountainous, and feature valleys (TMD, 2010). In contrast, while the northern part of the Central

region is mountainous, it is predominantly characterised by a large low level plain where several major rivers merge (World Bank, 2004; TMD, 2010). The Eastern region borders the Gulf of Thailand and generally features plains and valleys (TMD, 2010). The Southern region is a peninsula which has a long chain of mountains in its northern and western parts (TMD, 2010).

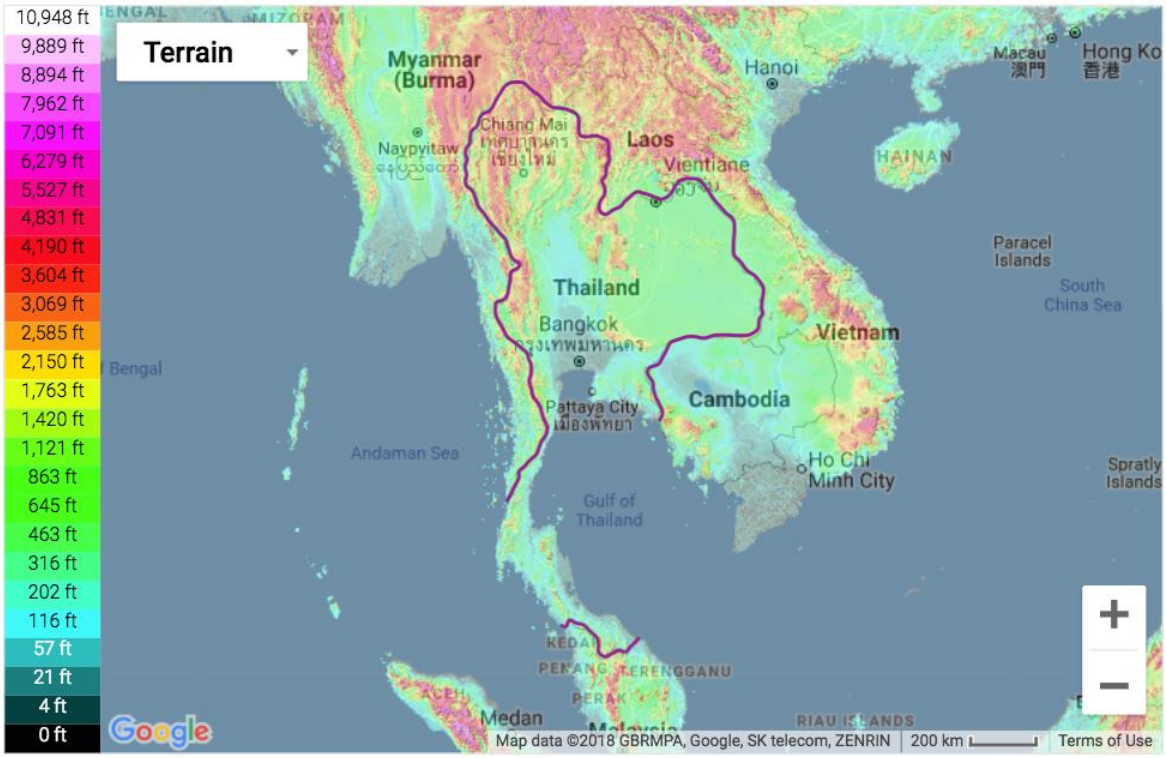


Figure 5.1 Topography of Thailand. Source: (Topographic-map, 2018).

The climate in Thailand is divided into three seasons: rainy (or southwest monsoon season), winter (or northeast monsoon season), and summer (or pre-monsoon season) (TMD, 2010). Generally, it rains across the country from mid-May to mid-October, but the wettest period is from August to September (TMD, 2010; World Bank, 2004). Only the east coast of the southern part of Thailand has rainfall until the end of the year, and it is always hot and humid in this part of the country. The winter stretches from mid-October to mid-February (TMD, 2010). Summer takes place from mid-February to mid-May and it becomes considerably warmer, particularly in the northern part of the country (TMD, 2010).

As presented in Fig. 5.2., the World Bank (2016) suggests that in both 2002 and 2013 the regions in Thailand with the highest to lowest Gross Domestic Product (GDP) per capita were Bangkok, the Central region, the South, the

North, and the Northeast region, respectively. This is the same order as far as regional labour productivity is concerned. The poorest region in the country is the 'Deep South' (the southernmost region in the country), and this is followed by the Northeast and the North (The World Bank, 2016). Elderly citizens (aged above 65) in these three regions have higher poverty rates compared to the national average. Compared to other income demographics in Thailand, the poor tend to be less educated and rely more on income from farming and labour. The difference in the poverty rates for each region thus reflects Thailand's relatively high socio-economic disparity.

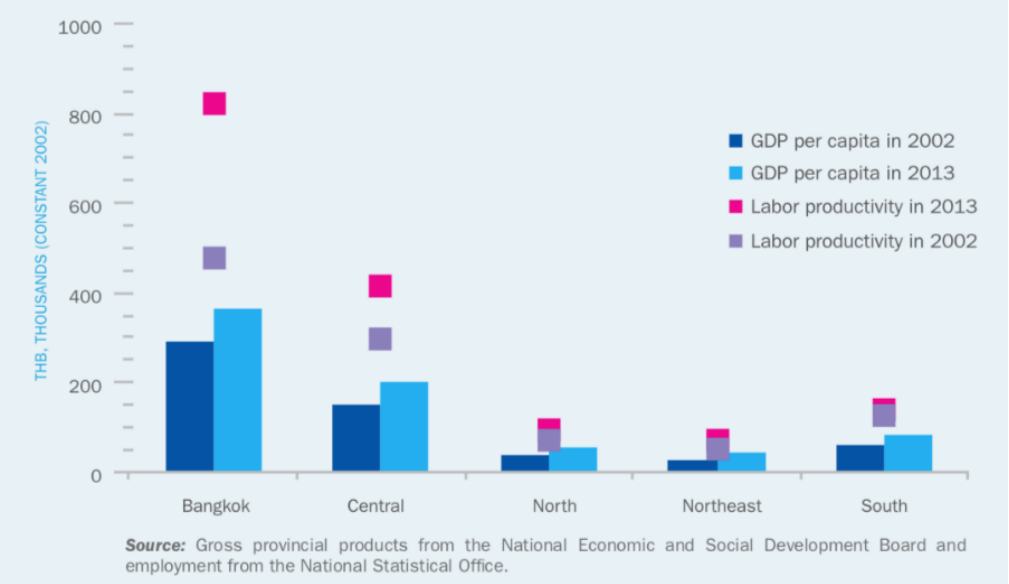


Figure 5.2 Regional GDP per capita and labour productivity in 2002 and 2013. Source: The World Bank (2016, p.58).

In general, Thais living in rural areas generate income by providing labour for agricultural and non-agricultural activities. Others are involved in private transfer (e.g. remittances from migration) or receive public welfare (World Bank, 2016). Croplands make up about 38% of the total area of the country (Nahm and Sutmmakid, 2003) and Thailand's main agricultural outputs are rice, rubber, cassava, sugar, and livestock. Despite a high reliance on farming across the country, the availability of irrigation systems differs in each region (Fan, Jitsuchon and Methakunnavut, 2004). Since the facilities available to support farming differ from region to region, this influences crop productivity and income potential. This in turn impacts people's choice of career/employment in each area.

Transport options in each region of Thailand vary as presented Fig. 5.3. The transport options available depend on issues like the concentration of population, economic activities and traffic congestion (Jaensirisak *et al.*, 2017). Jaensirisak et al. (2017) suggest that road transport is the main transport option for passengers and freight in Thailand, and this is followed by rail and air. Differences in transport facilities and options lead to different impacts on people's livelihoods and different poverty levels between urban and rural areas (Donnges, 2001; Tacoli, 2002, 2003; Porter, 2014). Likewise, limited transport options impact the interpersonal relationships of chain actors within a commodity system and may lead to overdependence on middlemen. This in turn might contribute to exploitation and dependency (Tacoli, 2002, 2003), including the environment impacts based on transport modes (O'Mahony *et al.*, 2002; Eyring *et al.*, 2010; Lee *et al.*, 2010; Uherek *et al.*, 2010).

Although the country does have a national master plan in place to improve its infrastructure in terms of roads, railways, and water transport in urban and rural areas, in reality the Thai government prioritises intercity transport networks and the mass transit systems of Bangkok and other major industrial cities (The World Bank, 1997; Jaensirisak *et al.*, 2017). As Thailand's capital, Bangkok has a much higher density of population than other parts of the country. As such, the public transport options it offers are designed to ease the traffic issues that are inherent to such a major metropolitan area (Jaensirisak et al., 2017; Nahm & Sutummakid, 2003).

The Royal Thai Government plans to invest US$43 billion in the Eastern Economic Corridor (EEC) development plan over the next five years (Dunseith, 2018; EECO, 2018). The plan aims to improve social and physical infrastructure by expanding sea, land, and air trade routes in three main Eastern provinces. Part of the Thailand 4.0 initiative, the plan is to make this region the leading economic zone in the 'Association of Southeast Asian Nations' (ASEAN) and move Thailand away from a predominantly agriculture and manufacturing base to a more innovation-driven economy (Dunseith, 2018; EECO, 2018). However, the extent to which this initiative will impact the economy and address socioeconomic inequality in urban and rural areas is difficult to determine.



Figure 5.3 Transportation map of Thailand. Source: (Nations Online, 2018).

The next section describes regional backgrounds of Thailand.

5.2 Exploring Regional Backgrounds of Thailand

Thailand has rich biodiversity and while many regions share similarities, differences in human activity, climate and soil conditions lead to differences in biological resources (University of Texas Libraries, no date; World Bank, 2004; Ministry of Natural Resources and Environment, 2005). As shown in Fig. 5.4, regional eco-industrial clusters reflect natural resources across the nation (Anbumozhi, 2007). The main economic value of biodiversity is concentrated in the agricultural, fishing and forestry sectors (World Bank, 2004).

Cluster	Northern	Central	Southern	Northeastern
Orange	✔			
Ceramics	✔			
Pineapple Processing	✔	✔	✔	✔
Longan	✔			
Silk	✔			✔
Handicrafts	✔			
Tourism	✔		✔	
Fruit Processing	✔	✔		
Pottery Products	✔			✔
Mulberry paper products	✔			
Pamelo	✔	✔		
Rice Processing	✔	✔		✔
Mango Product		✔		
Sugar Plants		✔		✔
Durian Processing		✔	✔	
Orchid		✔		
Food Processing		✔		
Rambutan Processing		✔	✔	
Chang Island		✔		
Mangosteen		✔	✔	
Organic Asparagus		✔		
Oil Palm			✔	
Parawood			✔	
Seafood			✔	
Coconut			✔	
Fish scale accessories			✔	
Artificial Flowers producers				✔
Paper Pulp				✔
Cotton				✔

Northern Region consists of Chiang Mai, Chiang Rai, Kamphaeng Phet, Lampang, Lamphun, Mae Hong Son, Nakhon Sawan, Nan, Phayao, Phetchabun, Phichit, Phitsanulok, Phrae, Sukhothai, Tak, Uthai Thani and Uttaradit Provinces

Central Region consists of Bangkok, Nakhon Pathom, Nonthaburi, Pathum Thani, Samut Prakan, Samut Sakhon, Ang Thong, Ayutthaya, Chainat, Lopburi, Saraburi, Singburi, Kanchanaburi, Phetchaburi, Prachuap Khiri Khan, Ratchaburi, Samut Songkhram, Suphanburi, Chachoengsao, Chanthaburi, Chonburi, Nakhon Nayok, Rayong, Prachinburi, Sa Kaeo and Trat Provinces

Southern regions consists of Chumphon, Krabi, Nakhon Si Thammarat, Narathiwat, Pattani, Phang Nga, Phatthalung, Phuket, Ranong, Satun, Songkhla, Surat Thani, Trang, Yala

Northeastern region consists of Amnat Charoen, Buriram, Chaiyaphum,Kalasin, Khon Kaen,Loei, Maha Sarakham, Mukdahan,Nakhon Phanom, Nakhon Ratchasima, Nongbua Lamphu, Nong Khai, Roi Et, Sakon Nakhon, Sisaket, Surin, Ubon Ratchathani, Udon Thani and Yasothon Provinces

Figure 5.4 shows eco-industrial clusters in each region of Thailand. As it relates to administrative issues, this information is only available based on the 4-region system. Source: (Anbumozhi, 2007, p. 22).

The environment in Thailand has deteriorated due to industrial growth and the failure of environmental management (World Bank, 2004). Since 1973 there has been a steady decrease in the density of forest around the county.

As of 2017 only 31.6% of Thailand's landmass featured forests (The Royal Forest Department, 2017). However, this figure might change over time, depending on how humans manage these areas. The Thai government is currently attempting to restore and protect biodiversity through research and by leveraging its institutions to raise awareness and implement policy and law (World Bank, 2004; Office of the U.S. Trade Representative, 2005; PRD, 2016).

While a suitable environment is key, the culture and tradition in each region play a significant role in determining where silk production and silk weaving take place. Even though soil and climate conditions in the North of Thailand are more suitable for sericulture, there is less silk production here than in the Northeast of the country (Isan) (ibid). Silk plays an important part in ceremonies in Isan, and silk production is key to the region's culture and traditions. As a result, despite environmental issues making the Northeast less able to expand its sericulture activity, silk yarn is produced all year round, and 97.5% of all silk yarn produced in Thailand comes from this region (EU-Thailand Small Project Facility, 2007).

Most of the South is tropical, with high rainfall and very high humidity (World Bank, 2004; EU-Thailand Small Projects Facility, 2007). Southern hill slopes are covered with rainforests (World Bank, 2004). Likewise, the South also has many mangrove forests, sea grass beds, and mudflats (World Bank, 2004). This restricts the expansion of sericulture in the region (EU-Thailand Small Project Facility, 2007) and makes year-round silk production problematic. Similarly, while the region also has its own agriculture, the climate in the East is also characterised by high humidity (EU-Thailand Small Project Facility, 2007). In contrast, the West is a developing 'industrial zone' which provides jobs for the surrounding areas and is not suited to sericulture (EU-Thailand Small Project Facility, 2007).

Several studies have suggested that sericulture is traditionally regarded as being more suited to women than agriculture. As a result, women are empowered by the fact that they take more important roles in sericulture activity (Haggblade and Ritchie, 1992; Setboonsarng, 2002; Earth *et al.*, 2008; Siewsamdangdet, Vemuri and Bretherton, 2010). As there are higher levels of silk production in the North and Northeast, logically female empowerment is more likely to occur in these regions (Naenna, 1984;

Haggblade and Ritchie, 1992; Payanun, 1995; EU-Thailand Small Projects Facility, 2007). However, a lack of research into the role of gender in silk-related industries means there is uncertainty regarding the degree of empowerment women in these regions experience.

This research investigated sericin soap value chains originating at communities in four geographical locations around Thailand: Huaysai (HS) community in Nakhon Ratchasima province (Northeast); Poethong Charoen (PTC) organic agriculture group in Chiang Mai province (North); Chumtabong (CTB) community in Nakhon Sawan province (Central); and Nayaw-NaUdom (NN) communities in Buriram province (Northeast). These communities were chosen to shed light on real-life contexts of the soap value chain in various parts of the country. The research included broad geographical coverage with the aim of limiting the influence of local factors and adequately representing the commodity chain of soap produced by sericulture community enterprises in Thailand.

Huaysai and Nayaw-NaUdom community enterprises were selected to represent soap value chains that were supported by Clinic Technology offices. Both enterprises were promoted as the 'Heads of Science & Technology Villages' from the Clinic Technology programmes. The intent of the research was to examine the similarities and differences in the operation of Clinic Technology offices in various locations and highlight their impacts on locals, communities and the environment. Comparing their practices would allow the researcher to investigate to what extent local and cultural factors influence the operation of this agency's community development projects.

Chumtabong community enterprise was chosen because it was the only enterprise supported by the Biodiversity-based Economy and Development Organisation. It was selected to determine how the support of different agencies might impact community enterprises. While Neal (2014) claims that this enterprise applies 'a sustainable and environmentally responsible practice' to its cosmetics production, there is no indication of the methods and approaches he used to make such an assertion. His research therefore lacks credibility and for this reason this research attempted to justify Neal's statement and fill a gap in the research by investigating the socioenvironmental impacts of soap production at Chumtabong enterprise.

Poethong Charoen community enterprise was selected because it was the only enterprise that had stopped producing soap. The aim was to compare this enterprise with others that were successfully involved in soap production and highlight the challenges and obstacles a community enterprise needs to overcome to succeed in the soap market.

The following sections describe the regional backgrounds of each case study. Then, it goes on to present histories and backgrounds of community enterprises studied.

5.2.1 Background of Northeast Region of Thailand

The Northeast is Thailand's largest region and makes up approximately a third of the country's total land area (Ekasingh *et al.*, 2008). As depicted in Fig. 5.5, it is comprised of 20 provinces and is the country's most populous region. It is predominantly inhabited by families that migrated to Thailand from Laos (Ekasingh et al. 2008). The differences between Lao and Thai ethnicities are not immediately obvious, and while considering race per se makes measuring differences difficult, comparing culture and language proves more beneficial (ibid).

Isan's largely hilly terrain and poor soil conditions mean it is not well-suited to agriculture (Parnwell, 1988; Jitsuchon, 1989; Morton, 1989; Ekasingh *et al.*, 2008). Overutilisation and under replenishment mean the soil is sandy, nutrient-depleted (Ekasingh *et al.*, 2008), and often has high levels of salinity or acidity. Likewise, as a natural basin, Isan is flood-prone (Parnwell, 1988; Jitsuchon, 1989). Despite such obstacles, the majority of Thailand's farmers are found in this region (EU-Thailand Small Projects Facility, 2007; NSO, 2013).

Parnwell (1988) and Ekasingh et al. (2008) conclude that as the environment is key to the livelihood of farmers, poor environmental conditions in Isan contribute to widespread rural poverty and limited employment opportunities. This, coupled with increasing population numbers and scarcity of cultivatable land, has led to a decline in both agricultural productivity and environmental conditions (Parnwell, 1988). Political division is another factor that serves to increase poverty within the region (Ekasingh et al., 2008). Likewise, the region is peripheral to Bangkok, and lack of business opportunity makes economic growth difficult (Parnwell, 1988). As a result,

growing numbers of Isan people migrate to industrial cities to seek employment (Parnwell, 1986).

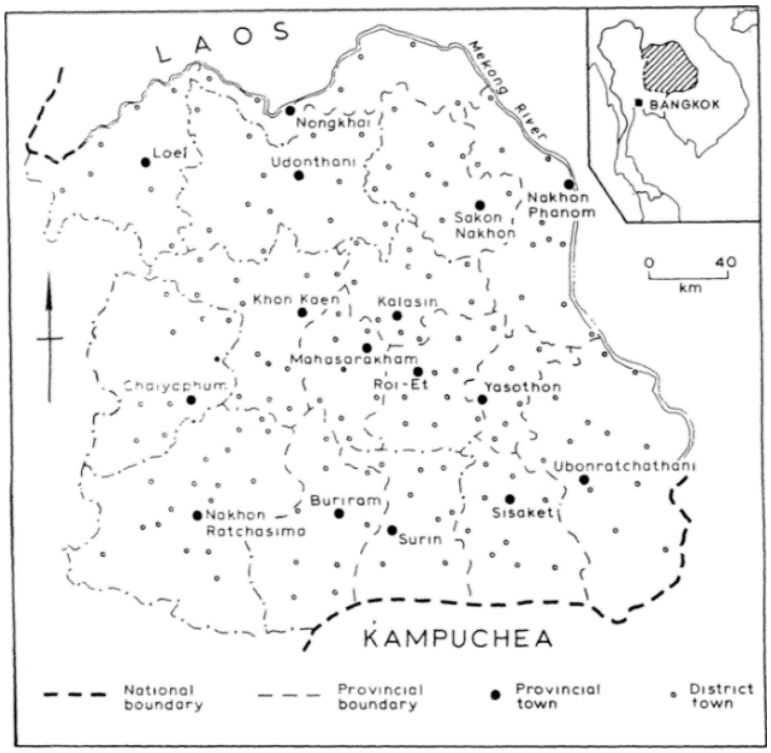


Figure 5.5 Map of Northeast Thailand, showing its 20 provinces. Source: (Parnwell, 1988).

Apart from the agricultural sector, other labour-intensive and resource-intensive sectors have become increasingly prominent in Isan since the mid-1990s. These include textile and furniture production, food processing, and electronic parts manufacturing (Ekasingh et al. 2008). These industries diversify the Isan economy, enabling locals to reduce dependency on cash crops and allowing the economy to grow more effectively (Ekasingh et al. 2008).

Fig. 5.6 presents the topography of the Isan region. Isan has a dry, low plateau known as the *Khorat Plateau*. The Isan climate is distinct to that of other regions. Mountains block south-westerly monsoons from reaching the area, and this causes a long dry season. (Ekasingh *et al.*, 2008). Consequently, more than 80% of yearly rainfall occurs from May to September or October (Parnwell 1988; Ekasingh et al. 2008). Rainfall in Isan is not sparse, but it is erratic and unreliable, and this makes the area prone

to drought and flooding (Ekasingh et al. 2008). Isan experiences a cold season from October to February.

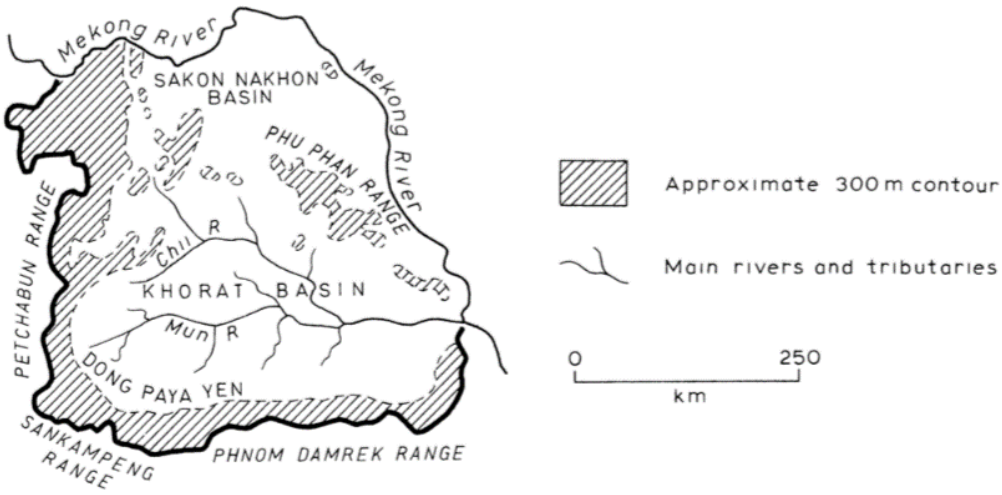


Figure 5.6 Topography of Northeast Thailand. Source: (Parnwell, 1988).

The northeast region is relatively low and flat with only 15% of the area containing mountains (Choenkwan, Fox and Rambo, 2014). Natural forests in the Isan mountains are susceptible to fire and have mostly been destroyed to accommodate agriculture (World Bank, 2004). Farmers from both lowland and highland areas grow rice, maize, cassava, and sugarcane (Fig. 5.7) (Ekasingh *et al.*, 2008; NSO, 2013; Choenkwan, Fox and Rambo, 2014). Similarly, rubber and fruit crops are increasingly cultivated in the region (Choenkwan et al., 2014; NSO, 2013).

Glutinous rice is important in northern Isan while non-glutinous rice is grown in southern Isan (Ekasingh *et al.*, 2008). Unlike cash crops, which are farmed solely for sale, rice is farmed both for subsistence and for commerce. More than 60% of all farms in Isan of around 10 million hectares in size were involved in rice cultivation from 1978 to 2003 (Ekasingh et al., 2008).

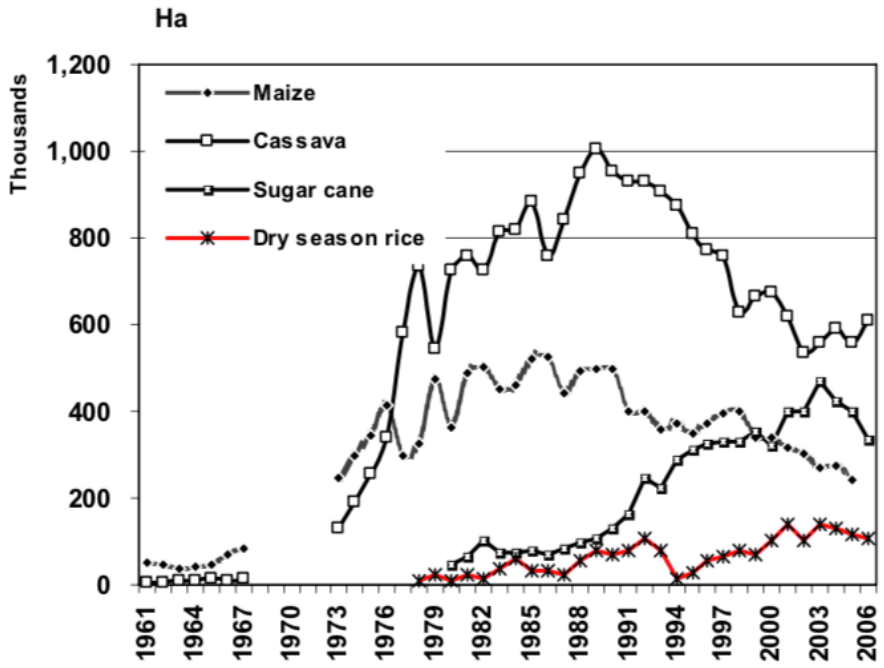


Figure 5.7 Major cash crops grown in Northeast Thailand from 1961 to 2006. Source: (Ekasingh et al., 2008).

The following sections present backgrounds of Huaysai and Nayaw-NaUdom sericulture community enterprises which situate in the northeast Thailand.

5.2.1.1 Huaysai (HS) Sericulture Community Enterprise, Northeast Thailand



Figure 5.8 The entrance of Huaysai community. Source: author, 2015.

Huaysai sericulture community enterprise is in Huaysai community, Nhongmanaw sub-district, Khong district, Nakhon Ratchasima province (see

Figs. 5.10, 5.11, and 5.12). Figures 5.8 and 5.9 depict the area local to the community. The enterprise was founded by a group of sericulturists who lived in Huaysai village in 2005. In total, the enterprise has 126 members and, like in other parts of the district, they are predominantly involved in farming (Khong District Office, no date b; MOST 2014).



Figure 5.9 An example of a local house in Huaysai community. Source: author, 2015.

In general, Huaysai locals mainly cultivate rice, sugarcane, cassava, and corn (Fig. 5.13) while simultaneously raising livestock including chickens, cows, ducks, buffaloes, and pigs (Fig. 5.14) (Khong District Office, no date b). In total, Huaysai village has 899 residents (Nhong Manaw Sub-district Administrative Organisation, 2013). Unfortunately, the gender division of labour in this community is still barely understood.

The Clinic Technology program of the Ministry of Science and Technology (MOST) has supported the Huaysai sericulture community enterprise since 2011. Typically its assistance has included silk-related knowledge and technology transfer in areas like silk dyeing, silk weaving, and silk-based cosmetics (MOST 2014). Prior to receiving Clinic Technology assistance, the enterprise had only traded mulberry leaves, silk cocoons, silk yarns, and produced silk handicrafts. Village sericulturists are supervised by the Clinic Technology office at Nakhon Ratchasima Rajabhat University (NRRU) in Nakhon Ratchasima province (MOST 2014).

The Huaysai community enterprise embraces nonchemical sericulture practices and is recognised as being a *green sericulture community* (MOST 2015b). As a result, MOST promoted the community, making it a *Head of Science and Technology Village* (MOST, 2016). Despite the title, there has been no research into the environmental impact of its silk production.

In addition to assistance from NRRU, the community has also benefitted from input into production methods for sericin-based cosmetics provided by the Thailand Institute of Nuclear Technology (MOST, 2016).

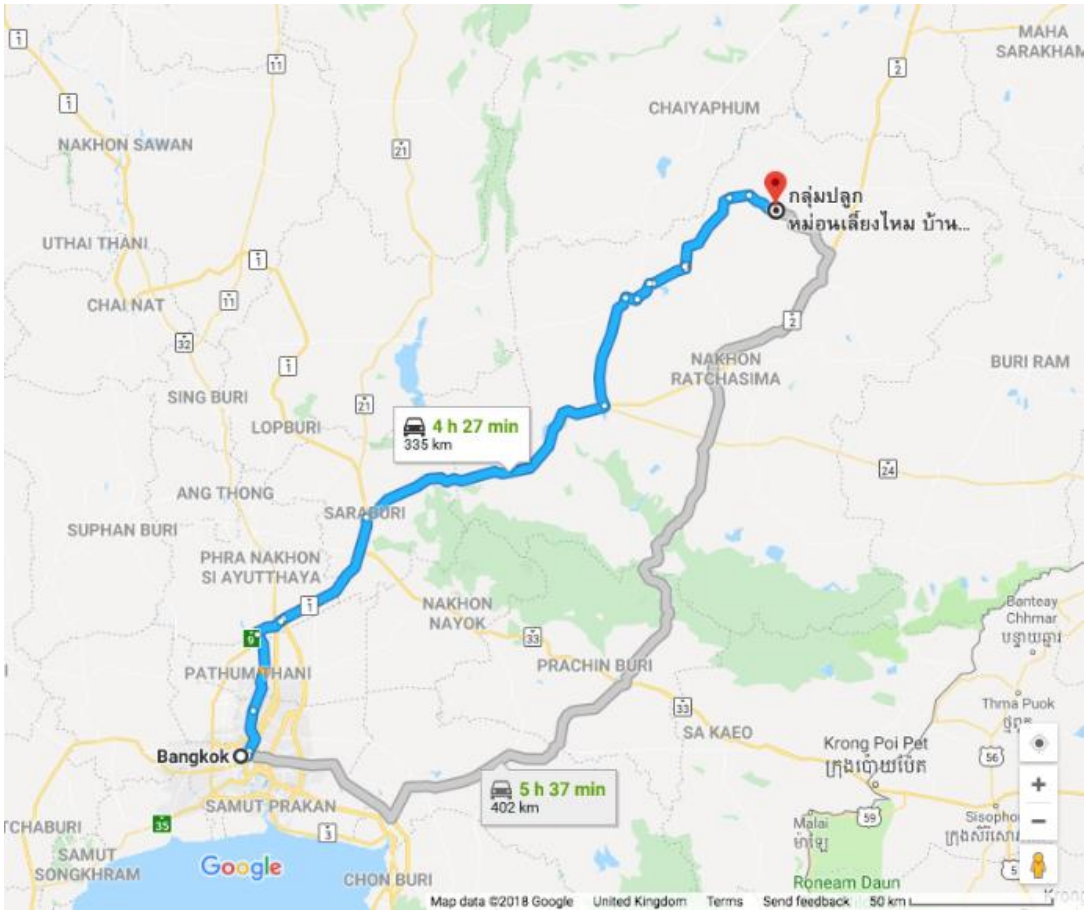


Figure 5.10 Depending on the route taken, Huaysai village is about 335-402 km away from Bangkok. Source: Google Maps.



Figure 5.11 Map of all 16 villages in Nhongmanaw subdistrict. Huaysai village is on the West side of this subdistrict. Source: (Nhong Manaw Sub-district Administrative Organisation, 2013).

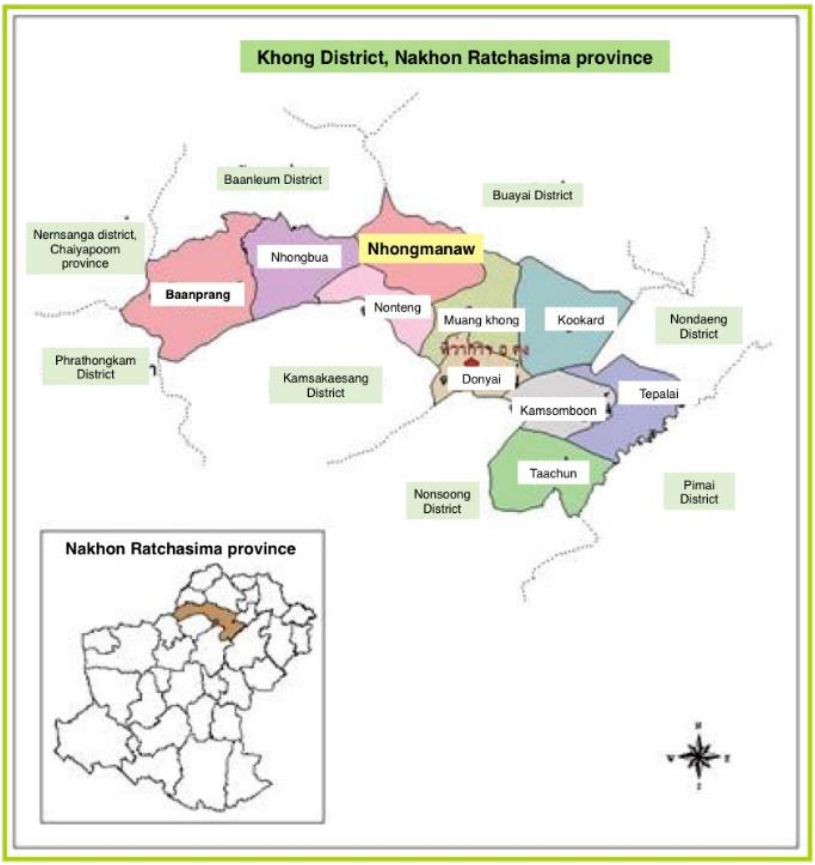


Figure 5.12 Map of Khong district which comprises ten sub-districts. Nhongmanaw subdistrict is in the North of this district (Khong District Office, no date a).

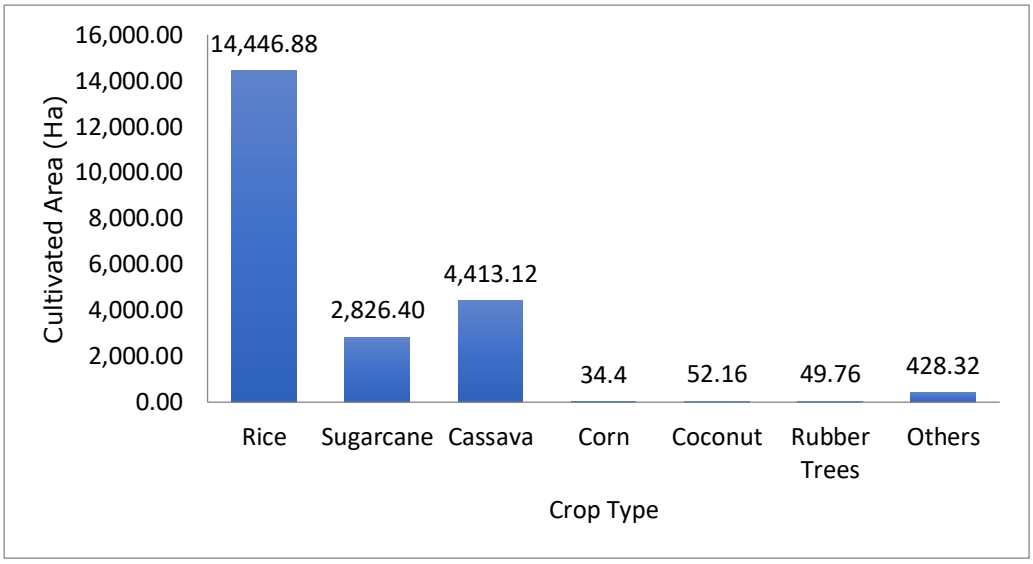


Figure 5.13 Agricultural land use in Khong district. Source: (Khong District Office, no date a)

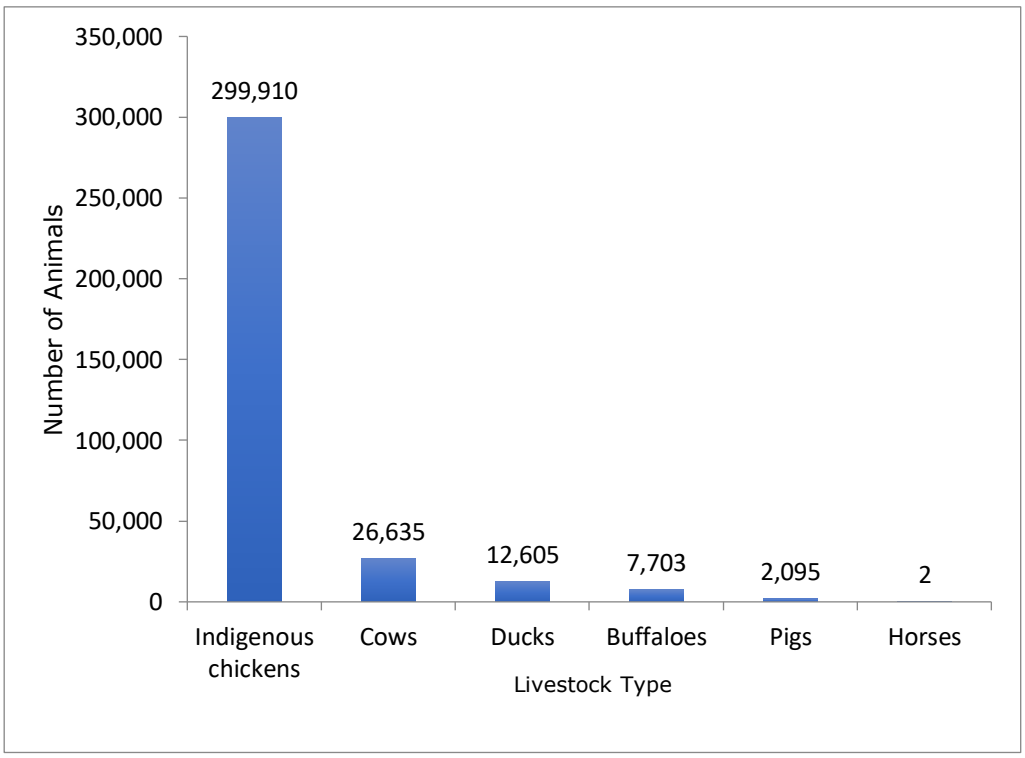


Figure 5.14 Livestock raised by villagers in Khong district. Source: (Khong District Office, no date a)

5.2.1.1.1 Geography of Huaysai Community

Huaysai village is located on high ground (about 180-190 m above sea level) in Nhong Manaw subdistrict. The land sits on slopes from the northwest of the village (highland) to the south-eastern part of the village (lowland)

(Nhong Manaw Sub-district Administrative Organisation, 2013). Whereas the east of the village has a reservoir where rainwater is collected, this high ground area is used for farming and raising animals (Nhong Manaw Sub-district Administrative Organisation, 2013).

Huaysai village covers 15.44 km^2 (about 23% of the subdistrict) and comprises a residential area (0.24 km^2), a rice farming area (4.8 km^2), an agricultural area (9.6 km^2), and livestock raising and communal areas (0.8 km^2) (Nhong Manaw Sub-district Administrative Organisation, 2013).

5.2.1.1.2 Socio-Economic Background of Huaysai Villagers

The majority of villagers are above 26 years old and the village has more women than men (Fig. 5.15) (Nhong Manaw Sub-district Administrative Organisation, 2015). As shown in Fig. 5.16, 49.8% of locals are farmers and 10.7% are involved in casual labour. In terms of education, 50.5% and 14% of locals received grade 4-6 and junior high school education, respectively (Fig. 5.17) (ibid).

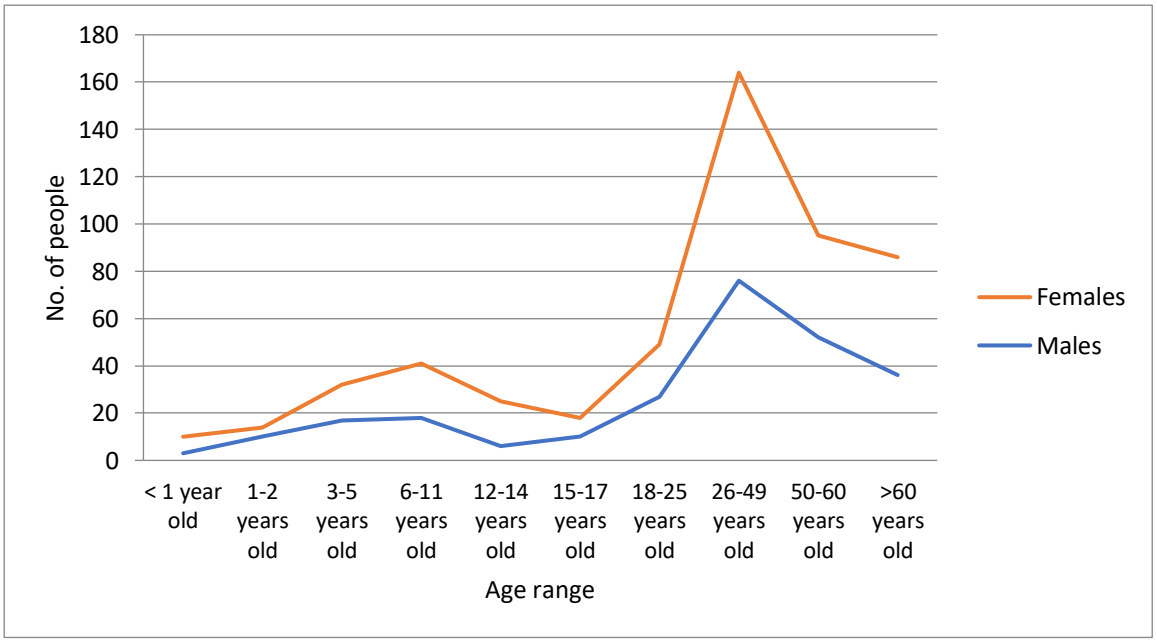


Figure 5.15 Age of Huaysai locals. Source: (Nhong Manaw Sub-district Administrative Organisation, 2015).

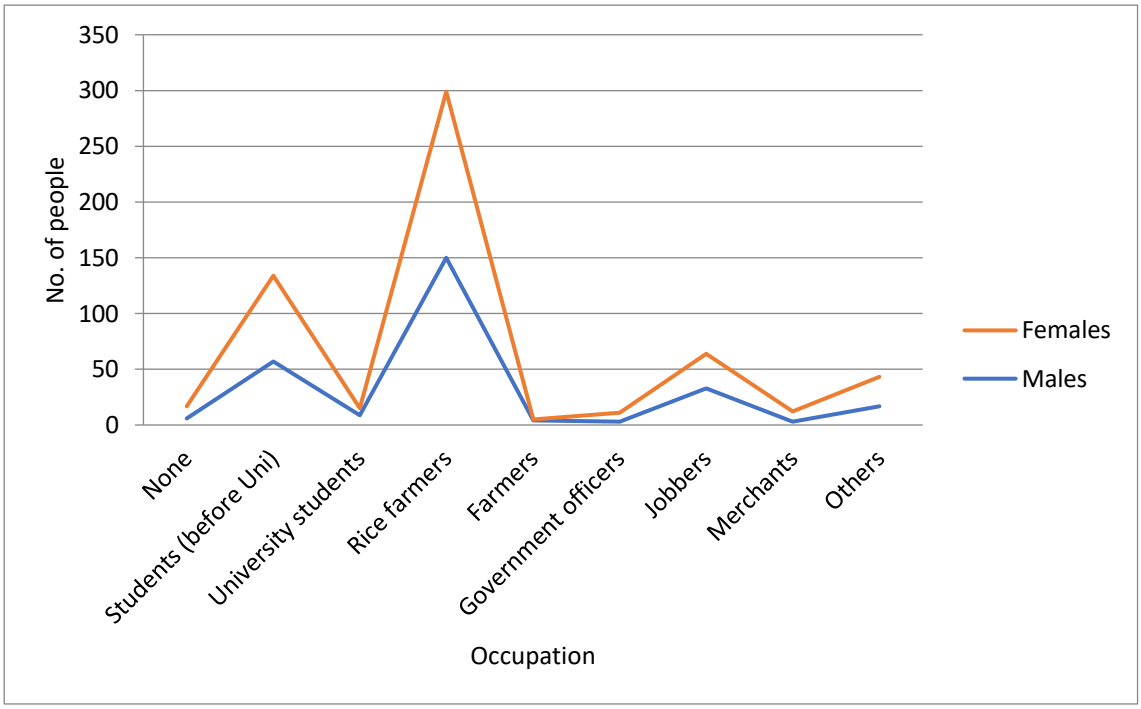


Figure 5.16 Job classification of Huaysai locals. Source: (Nhong Manaw Sub-district Administrative Organisation, 2015).

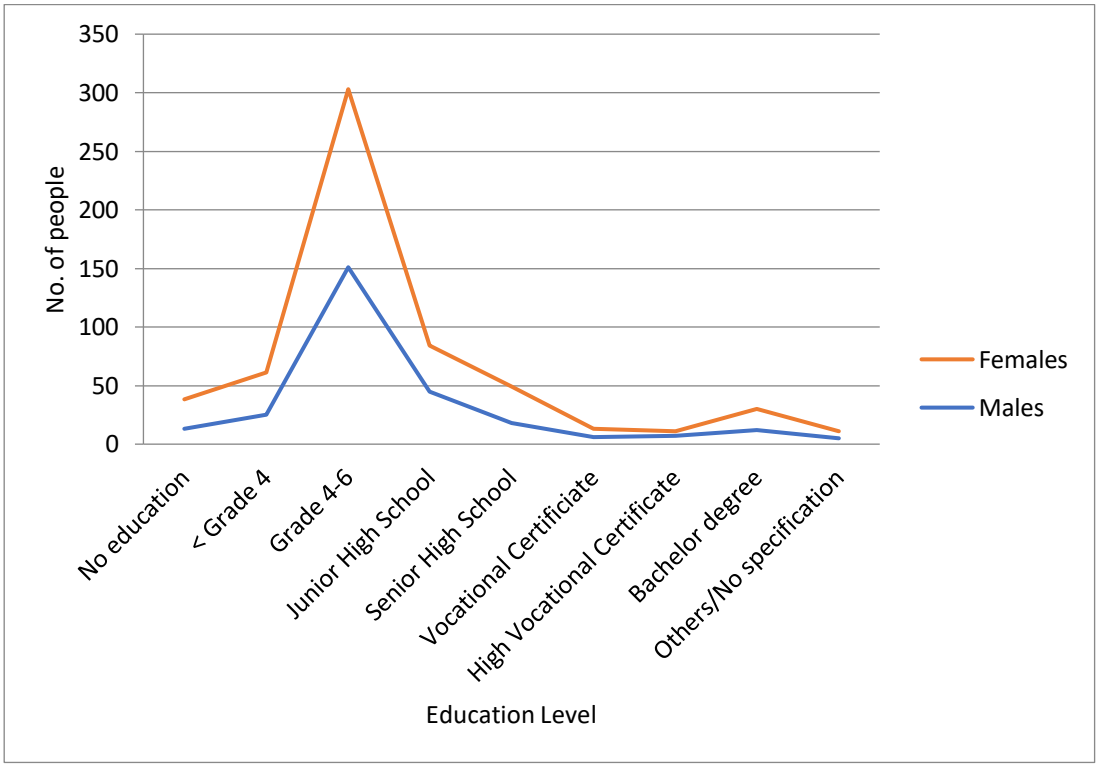


Figure 5.17 Education level of Huaysai locals. Source: (Nhong Manaw Sub-district Administrative Organisation, 2015).

5.2.1.2 Nayaw-NaUdom (NN) Sericulture Community Enterprise, Northeast Thailand



Figure 5.18 Local area of Nayaw community. Source: author, 2016.

The Nayaw-NaUdom (NN) sericulture community enterprise was founded in 1998 (MOAC, n.d.). The enterprise includes members from two adjacent villages (Nayaw and NaUdom) in Saodeaw subdistrict, Nhonghong District, Buriram province (Figs. 5.21 and 5.22) (Clinic Technology, 2012b). Currently, the group comprises 31 members, with the majority of members female (Clinic Technology, 2012b). As with other communities, there has been limited examination of gender division of labour at Nayaw-NaUdom community enterprise, and there is therefore little understanding of how it was shaped by the socio-economic characteristics of its members. Figures 5.18, 5.19 and 5.20 depict the local area of Nayaw community, the entrance to Nayaw-NaUdom sericulture community enterprise, and a communal work area for sericulturists.

Since 2012, Nayaw-NaUdom enterprise has been supported by the Clinic Technology office under Buriram Rajabhat University in Buriram province (Clinic Technology, 2012b). Acknowledging members' expertise in dyeing silk yarns using natural colours derived from plants, weaving silk, and performing traditional sericulture, the enterprise has been designated a *Head of Science & Technology Village* (MOAC, n.d.). At present, Nayaw-NaUdom

enterprise commercialises handmade silk handicrafts, soap, and lotions (MOAC, n.d.).



Figure 5.19 Entrance to Nayaw-NaUdom sericulture community enterprise. Source: author, 2016.



Figure 5.20 Communal areas where sericulturists can use silk weaving machines. Source: author, 2016.

5.2.1.2.1 Geography of Nayaw and NaUdom Communities

Encompassing both Nayaw and NaUdom communities, the Saodeaw subdistrict has a total area of 45.3 km^2 (Nhonghong Agriculture Organisation, 2005). Its topography consists of high ground and low ground which is sloped from west (high ground) to east (low ground). While a considerable amount of rice farming takes place in the flat area on the east side of the subdistrict (Nhonghong Agriculture Organisation, 2005), the hilly area in the west is used for cultivating sugarcane and cassava (Nhonghong Agriculture Organisation, 2005).

NaUdom community encompasses 1.61 km^2 (3.6% of total area of the subdistrict). The area is used for residences (0.08 km^2), agriculture (1.02 km^2) and communal areas (0.51 km^2) (Polmart, 2016). However, there is currently no data available relating the Nayaw community area.

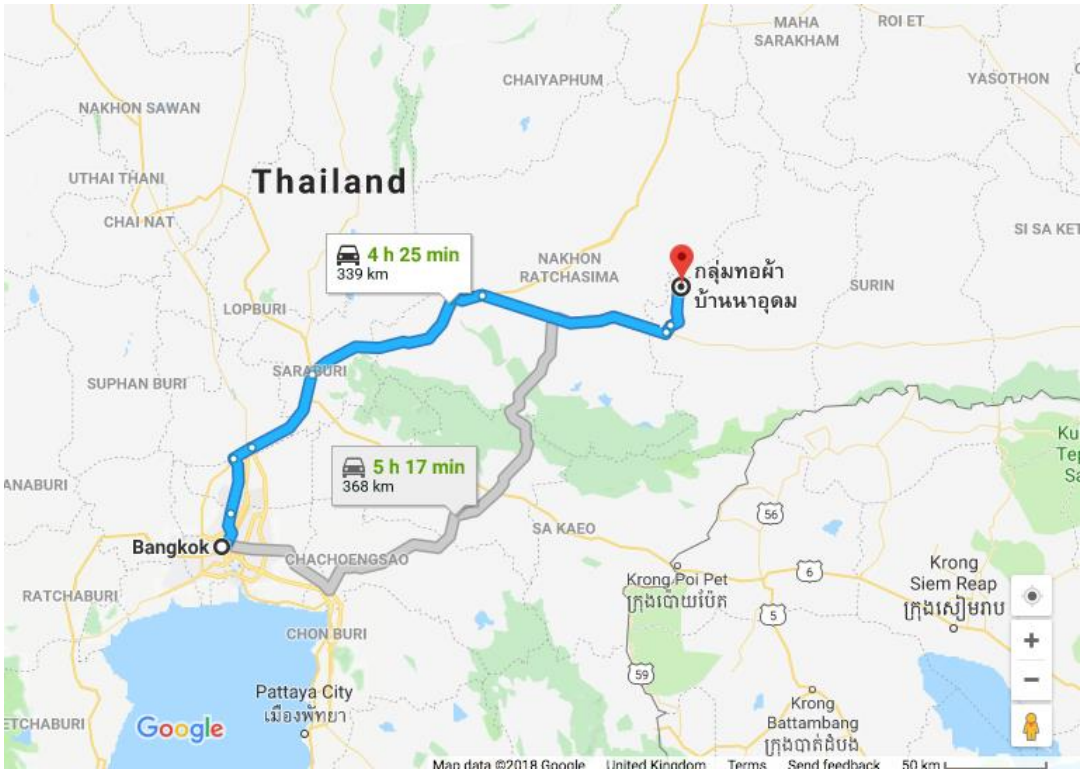


Figure 5.21 Depending on the route taken, Nayaw-NaUdom enterprise is about 339-368 km away from Bangkok. Source: Google Maps.

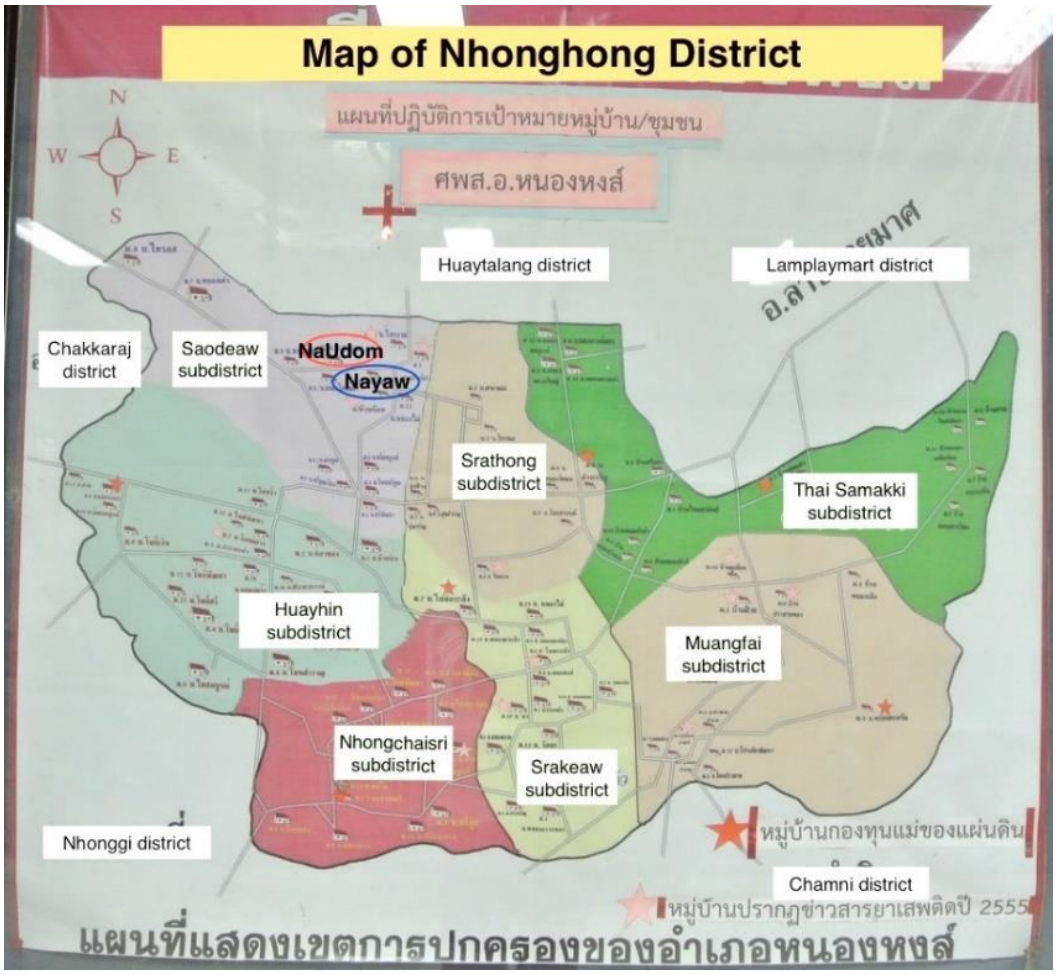


Figure 5.22 Map of Nhonghong district with all component subdistricts and villages. Source: author, 2016.

5.2.1.2.2 Socio-Economic Background of Nayaw and NaUdom Villagers

6,623 people live in Saodeaw subdistrict and only 5.24% of this population (347 people) live in Nayaw and NaUdom communities (SAO, 2016). There is currently no data available relating to gender division in these communities or the subdistrict.

Nhonghong Agriculture Organisation (2005) suggests that 80% of Saodeaw locals are agriculturists, 10% are personal contractors, 5% are merchants and government officials, and 5% undertake other occupations.

Like other Isaan farmers, locals in Saodeaw generally cultivate rice, sugarcane, and cassava (Choenkwan et al., 2014; Ekasingh et al., 2008). Likewise, they generate supplementary incomes by doing sericulture, growing vegetables, and raising livestock including cows, pigs, and fish

(Nhonghong Agriculture Organisation, 2005). The average yearly income of Saodeaw locals is 25,150 baht per household and their average yearly expenses are 23,050 baht per household (Nhonghong Agriculture Organisation, 2005).

Next is background of the North region of Thailand.

5.2.2 Background of North Region of Thailand

As shown in Fig. 5.23, the North region is made up of 9 provinces, with Chiang Mai province its administrative centre and trade hub (Glassman and Sneddon, 2003; Vanwambeke, Somboon and Lambin, 2007). About 80% of the land in the North of Thailand is hilly, mountainous, and intersected by flat-bottomed valleys that are several kilometres wide (Vanwambeke, Somboon and Lambin, 2007; Choenkwan, Fox and Rambo, 2014). Located at a higher altitude than other regions, the temperature here is generally 3-5℃ lower than the temperatures in the rest of the country.

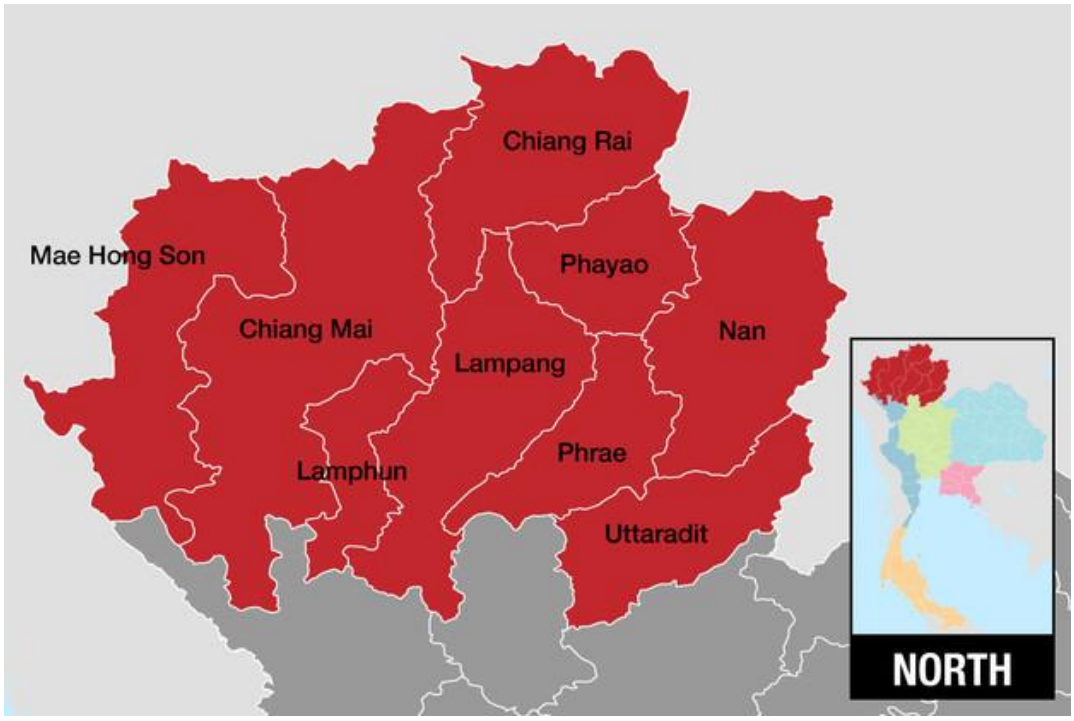


Figure 5.23 Map of Northern Thailand, showing its 9 provinces. Source: (Blog, 2015)

About 70% of the North region consists of highlands with elevations between 500 and 2,500 meters. Highland slopes are generally steep and soil

conditions vary between poor to fertile (Dearden, 1991). The North region has a favourable climate condition for small-scale farmers (EU-Thailand Small Project Facility, 2007). Its main rivers move towards the Chao Phraya River (Thailand's most important river) which flows through the lowland plains in central Thailand (World Bank, 2004). There are deciduous forests at lower altitudes, whereas higher elevations tend to be dominated by evergreen broad-leafed forests, often with native pine trees (World Bank, 2004).

Glassman & Sneddon (2003) argue that industrial development in Chiang Mai province has caused socioeconomic inequality and environmental pollution. While environmental conditions in the North are favourable for farming, Chiang Mai has moved from farm to predominantly off-farm employment. Higher education levels coupled with industrial growth have fuelled this transition, as has the limited availability of land and water. Likewise, population growth and improved infrastructure and transport have helped blur the boundary between rural and urban areas (Srimongkol and Marten, 1986; Rief and Cochrane, 1990; Singhanetra-Renard, 1999).

In many cases, agriculture is seen as supplementary to other activities in the North (Singhanetra-Renard, 1999). Agriculture is though still the primary activity in some parts of the region, with both lowland and upland farmers raising cash crops (Vanwambeke, Somboon and Lambin, 2007).

Similar to the northeast region, glutinous rice is the main subsistence crop in the North region of Thailand and normally grown during the rainy season (Srimongkol and Marten, 1986). Other vegetables, such as chili peppers, garlic, tomatoes, and soybeans, are grown during the cool season after the rice is harvested (Srimongkol & Marten 1986). Srimongkol & Marten (1986) argue that crop selection in the North region depends on market conditions and the availability of water.

Local people's lifestyles depend on environmental conditions and impact how they interact with the land. This is especially true in the North of Thailand. 76% of all hill tribes in the country live in the North region. There are 23 ethnic groups living in this geography (Bhruksasri, 1989). They are involved in swidden agriculture and cultivate crops such as upland rice, maize, cabbage, pumpkin, sesame and beans (Bhruksasri, 1989; Dearden, 1991;

Vanwambeke, Somboon and Lambin, 2007; Choenkwan, Fox and Rambo, 2014). The tribes have different socio-economic needs and the types of land available to them differs because of environmental conditions. As a result, the tribes adopt different farming practices and grow different crops (Walker, 1975, 1980).

Choenkwan et al. (2014) argue that mountain agriculture in North and Northeast Thailand is different because of different environmental conditions. Likewise, people in the North and Northeast represent different ethnic groups. Despite the differences, farmers in both regions raise livestock such as poultry and cattle (Bhruksasri, 1989; Dearden, 1991; Vanwambeke, Somboon and Lambin, 2007; Choenkwan, Fox and Rambo, 2014).

The succeeding section is background of Poethong Charoen community enterprise which is in the North of Thailand.

5.2.2.1. Poethong Charoen (PTC) Organic Agriculture Group, Northern Thailand



Figure 5.24 A local street in Poethong Charoen community. Source: author, 2015.

Poethong Charoen organic agriculture group is a community enterprise at Poethong Charoen village in Cherngdoi subdistrict, Doi Saket district, Chiang

Mai province (Figs. 5.27 and 5.28). Figures 5.24 and 5.25 show the local area where it is situated. The group was founded in 2006 at Poethong Charoen (Chaimongkon, 2013). There are 26 members of the group. 4 members produce compost fertiliser, 5 are involved in sericulture, and another 15 are engaged in farming (ibid).

Unlike the other enterprises involved in the case studies, members of this community enterprise practice sericulture together, and only at the Poethong Charoen community job-learning centre (Fig. 5.26). This centre has facilities for rearing silkworms and individual houses are therefore not used to produce silk. As with other selected case studies, the role of gender in community enterprise activities has yet to be fully established.

Of the organisations involved in the research case studies, Poethong Charoen is the only community enterprise with a community that has no tradition or history of undertaking sericulture. Sericutural practices were taken up at the enterprise after training was provided by Chiang Mai QSSC in 2009. No reports are available to indicate whether this community enterprise engages in soap production or has received any soapmaking training from the government like the other enterprises in the case studies have done.

Poethong Charoen members practice farming as their main occupation, growing organic vegetables and rice, and producing organic fertiliser from farm and food wastes (Chaimongkon, 2013). Chaimongkon (2013) discussed the factors which influenced the group's decision to change from chemical to organic agriculture and a main factor was that the majority of farmers wanted to consume organic vegetables and to trade them at high prices at local supermarkets (Chaimongkon, 2013).

The soil around Poethong Charoen village is quite fertile and farmers can draw water from a nearby reservoir. The village has the advantage of good transport infrastructure and it is convenient for visiting traders to go to the village and purchase agricultural goods.



Figure 5.25 Rice farm at Poethong Charoen community, adjacent to the village temple. Source: author, 2015.



Figure 5.26 The sericulture learning centre at the organic agriculture learning centre in Poethong Charoen village. This building has separate rooms for rearing silkworms, raising cicadas, and making compost fertiliser. Source: author, 2015.

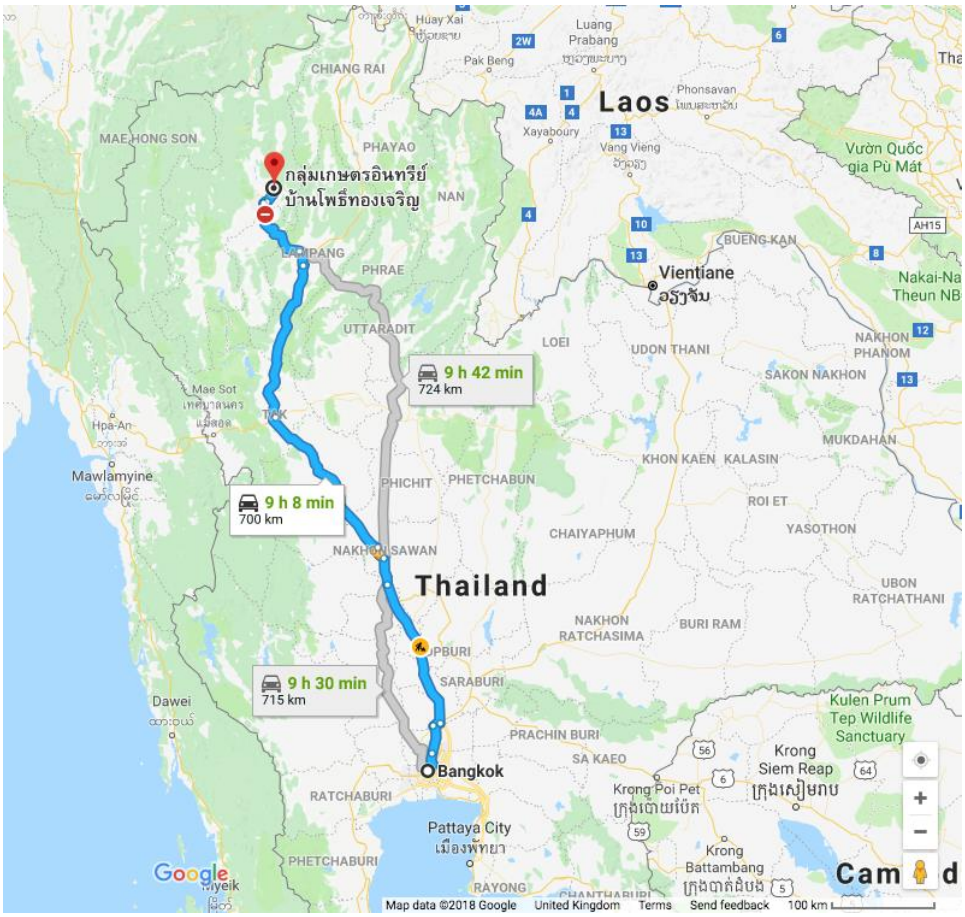


Figure 5.27 Depending on the route taken, Poethong Charoen community enterprise is about 700-724 km away from Bangkok. Source: Google Maps.

5.2.2.1.1 Geography of Poethong Charoen Community

Poethong Charoen village is 326 m above sea level and about 15 km away from Chiang Mai city centre (Chaimongkon, 2013; Mapcoordinates.net, 2016). The topography of the village includes forests, a flat area near the foot of the hill, lowland near canals, and natural basins (Cherndoi subdistrict Council, 2016). Although mostly flat, there is a hill at the northern end of the village (Chaimongkon, 2013).

5.2.2.1.2 Socio-Economic Background of Poethong Charoen Villagers

As illustrated in Fig. 5.28, the Cherngdoi sub-district covers 63 km^2 and comprises 13 villages with 7,396 residents (Cherndoi subdistrict Council, 2016). About 18% of the population resides in Poethong Charoen village (Cherndoi subdistrict Council, 2016). In terms of occupation, people from Cherngdoi subdistrict are mainly agriculturists (51%) with others contractors

(14%), government officials (12%), merchants (10%), and 13% involved in other fields (Cherndoi subdistrict Council, 2016).

Out of the 25 members of Poethong Charoen community enterprise, 60% were men aged between 39 and 80 years old (Chaimongkon, 2013). While 72% of members received a primary school education, 12% graduated from secondary schools, and 16% did not receive any education (Chaimongkon, 2013). Their average yearly incomes from agricultural and non-agricultural activities were 79,385 baht and 63,035 baht, respectively (Chaimongkon, 2013).

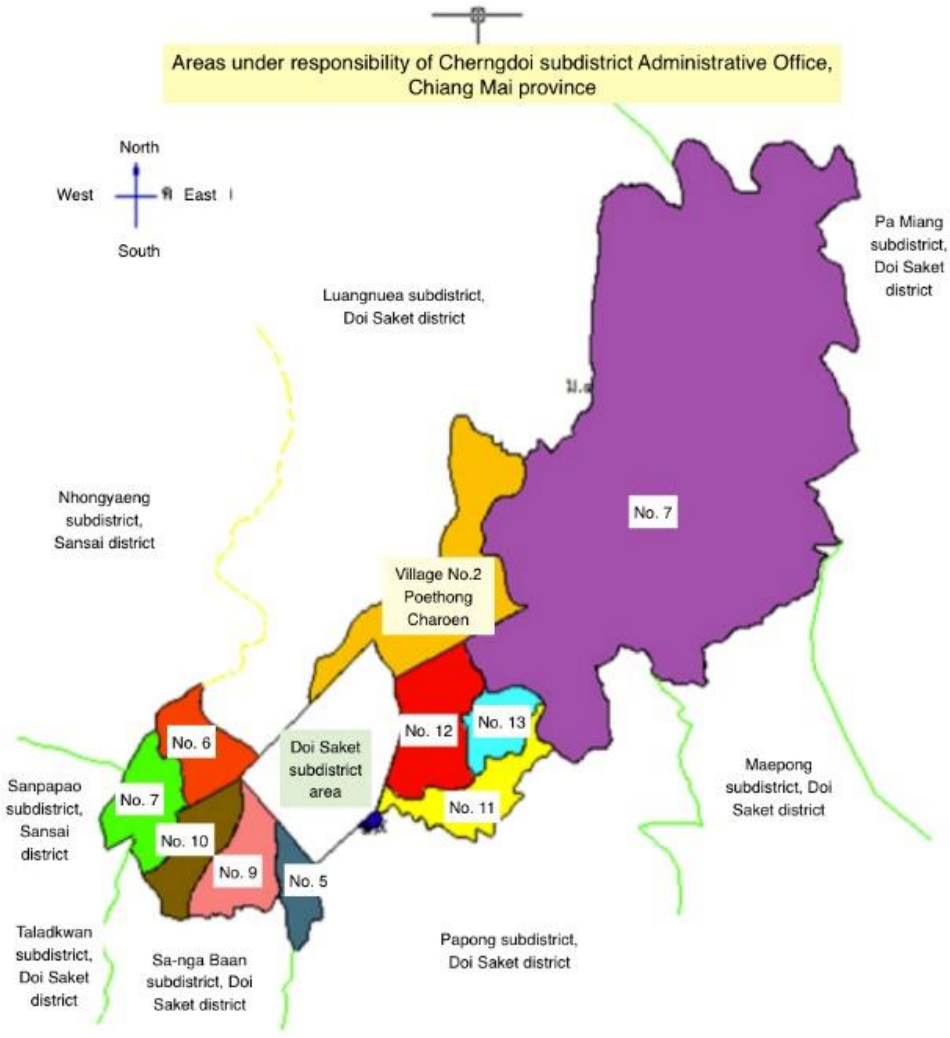
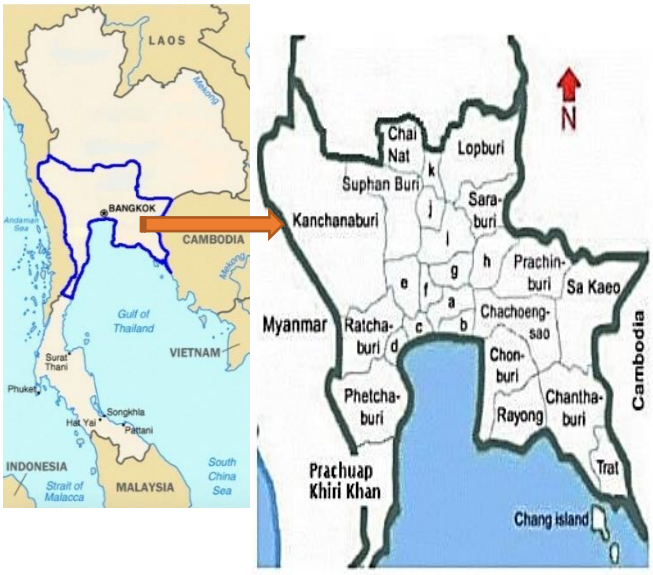


Figure 5.28 Map of Cherngdoi subdistrict including its constituent villages (Cherndoi subdistrict Council, 2016). Poethong Charoen village is at No. 2 on the map.

Next is background of central Thailand.

5.2.3 Background of Central Region of Thailand

The Central region is the alluvial basin of the Chao Phraya, Maeklong and Tachin rivers which provide fertile conditions for lowland crops (Nahm and Sutmmakid, 2003; World Bank, 2004, p. 2). Fig. 5.29 presents a map of the Central region. Areas which are near river basins have good soil fertility whereas areas closer to Myanmar that are near the mountains in the western area of the Central region have medium to low soil fertility (Nahm & Sutummakid, 2003). The Central region's industrial growth has led to deforestation (World Bank, 2004). Swamplands have become rice paddies and urban areas, and only a few forests are left on isolated limestone hills (World Bank, 2004).



The Central/Eastern Region of Thailand*

a = Bangkok
b = Samut Prakan
c = Samut Sakhon
d = Samut Songkhram
e = Nakhon Pathom
f = Nonthaburi
g = Pathum Thani
h = Nakhon Nayok
i = Ayutthaya
j = Ang Thong
k = Singburi (not included in the analysis)

* The national and regional maps have been borrowed from the US State Department's website (www.state.gov) and Trek Thailand's website (www.trekthailand.net) respectively.

Figure 5.29 Map of the central region, based on the four-region system. Source: (Nahm & Sutummakid, 2003).

In general, the economy of the Central region outperforms that of other regions (based on GDP per capita and labour productivity). Thailand's capital, Bangkok, is situated in the Central region, has the county's highest GDP per capita, and its best labour productivity (World Bank, 2016). Nahm & Sutummakid (2003) argue that the rivers in the Central region are used for transport and to support the country's agricultural and industrial sectors, and this helps make the region Thailand's economic and cultural hub. In addition, the region's long coastline along the Gulf of Thailand has facilitated the expansion of aquaculture for both domestic and global trade (Nahm and Sutmmakid, 2003; Belton and Little, 2008). As a result, locals from this region have good opportunities for employment due to their industrial expansion, providing options for people to work in off-farm sectors.

The succeeding section presents background of Chumtabong community enterprise in central Thailand.

5.2.3.1 Chumtabong (CTB) Sericulture Community Enterprise, Central Thailand



Figure 5.30 Local area of Chumtabong community. Source: author, 2016.

Chumtabong sericulture community enterprise is situated in Chumtabong community in Chumtabong sub-district, Chumtabong district, Nakhon Sawan province (see Figs. 5.32 and 5.33) (Kamtam, 2015, no date). Figures 5.30 and 5.31 show the local area and the sericulture learning centre at Chumtabong community. Most of those living in Chumtabong community

migrated to the area from the Northeast region with the aim of finding a better environment for agriculture (Kamtam, no date). The locals still preserve their north-eastern traditions, and these include being involved in producing and weaving silk in their households.

Chumtabong community enterprise was established in 2004 (Kamtam, no date) and officially registered as a SMCE in 2006. At the time of the study, the enterprise consisted of 24 members. Like the other enterprises involved in the case studies, gender divisions of labour have barely been researched in this community. Similarly, little is known about its soap business operation.

Neal (2014) presents that, with the support of the Biodiversity-Based Economy and Development Organisation (BEDO), the Chumtabong enterprise creates value-added by using silk waste sericin to produce cosmetics. The group had some previous experience in producing soap with the support of the Thailand Institute of Nuclear Technology. BEDO assisted them further in creating a wide range of sericin-based cosmetics (e.g. shampoos, soaps, conditioners, and body lotions) (Neal, 2014). BEDO provides the sericulture group with support in a number of areas including cosmetic production, marketing, and distribution. The group is permitted to sell their cosmetics at the Fahsai Gallery store in Bangkok, which is run by this agency.

There is a paucity of knowledge relating to the role of universities in supporting BEDO or the extent to which any support provided might impact communities. While Clinic Technology programmes share knowledge and technology with local communities through a network of local universities (MOST, n.d.), it is uncertain to what extent BEDO works with Thai universities for community outreach or extramural purposes within the communities. Whether the different strategies government agencies offer have an equitable or equal impact on communities is therefore open to debate.

BEDO’s known engagement with universities has included hiring a group of researchers from Rajamangala University of Technology Thanyaburi in Thailand to develop silk- and mulberry-based cosmetic formulas for Chumtabong community enterprise. BEDO also designed packaging and a

logo for the community (BEDO, 2019). The organisation has also collaborated with Charles University in Prague to quantify the amount of sericin in the soap produced by this group (ibid). There is though limited information regarding how other community development projects run by BEDO are supported by universities (BEDO, 2013, 2017). As a result, the impact of BEDO's support on each community might differ.



Figure 5.31 Sericulture learning centre at Chumtabong community. Source: author, 2016.

5.2.3.1.1 Geography of Chumtabong Community

Chumtabong community is one of the 12 villages in Chumtabong subdistrict (Fig. 5.33) (Chumtabong subdistrict Administrative Organisation, 2016). The community is located on high ground and surrounded by mountains, rivers, and canals. In addition, it is about 77 km away from the city centre of Nakhon Sawan province (Chumtabong subdistrict Administrative Organisation, 2016).

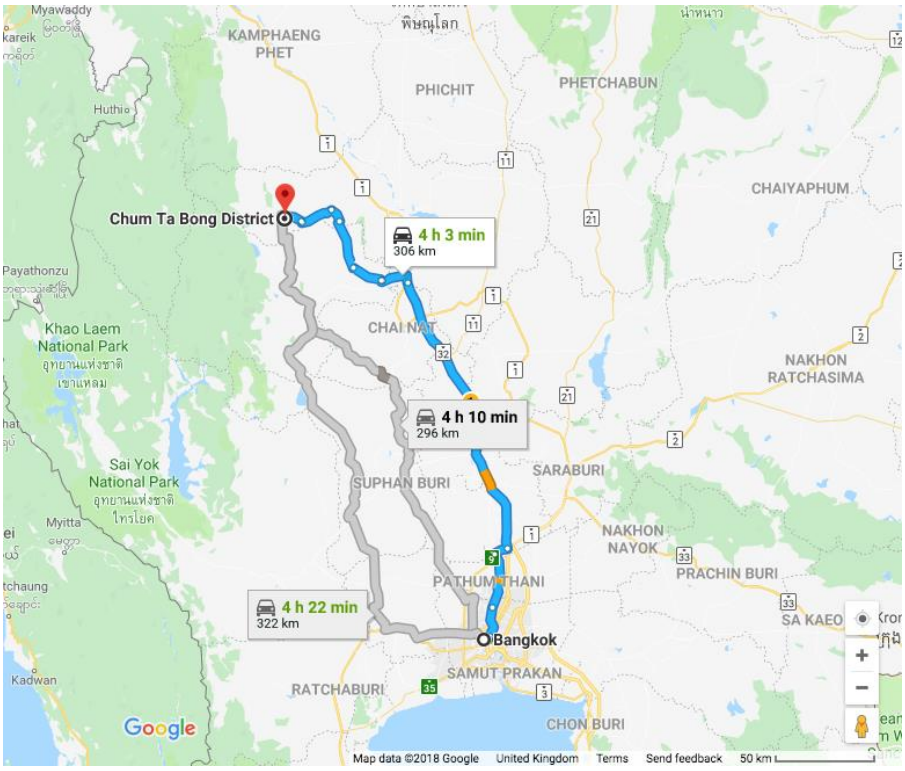


Figure 5.32 Depending on the route taken, Chumtabong enterprise is between 296-306 km away from Bangkok. Source: Google Maps.

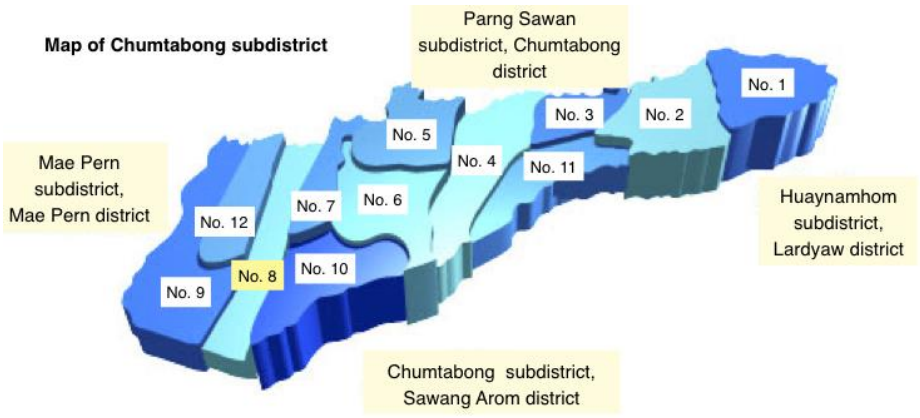


Figure 5.33 The composition of Chumtabong subdistrict which comprises 12 villages. The CTB village is at No. 8. Source: (Chumtabong subdistrict Administrative Organisation, 2016).

5.2.3.1.2 Socio-Economic Background of Chumtabong Villagers

In the Chumtabong sub-district, 80% of locals are agriculturists, 10% are contractors, 8% are merchants, and 2% are government officials (BEDO, 2013).

5.3 Summary

This chapter has provided an overview of the geography and climate of Thailand and its regions and introduced the locations included in the study. It has also provided contextual, geographical, and socioeconomic backgrounds to these communities.

CHAPTER 6-THE VALUE CHAIN 1: THE THAI GOVERNMENT AGENCIES

The upstream soap value chain is comprised of various Thai government agencies: the Queen Sirikit Department of Sericulture (QSDS), the Thailand Institute of Nuclear Technology (TINT), the Biodiversity-based Economy and Development Organisation (BEDO) and Clinic Technology offices (CT). Each agency was involved in providing the knowledge and support the enterprises needed to bring soap products to the market, while as suggested in Section 8.3, BEDO and CT also provided channels of distribution and were actively involved in trading on behalf of the enterprises.

This chapter presents the roles and impacts of two of these agencies: QSDS and TINT. The chapter also demonstrates the relationship and interdependence between the four organisations. While aspects of BEDO and CT are discussed briefly, as these bodies predominantly act as traders in the midstream soap value chain, a more detailed discussion of their roles and impacts is provided in Section 8.3.

6.1 Roles and Impacts of the Queen Sirikit Department of Sericulture in the Soap Commodity Chain

QSDS is the Thai government's primary agency responsible for promoting value-added products derived from silk production, including soap and cosmetics. QSDS provides a supportive environment that ensures soapmakers receive a continuous supply of silk, the source of the sericin extracts they use in the soap and cosmetics they produce. The agency also acts as an 'educator', offering farmers the input they need to improve silk production. Additionally, QSDS acts as a 'market facilitator', providing cost-free venues where soapmakers can sell their products.

This research substantiates existing literature by highlighting the roles of QSDS as a market facilitator and an educator. In addition, using the *Follow the Thing* approach, the research complements studies that have not emphasised or evaluated the roles and impacts of the agency in the soap commodity system (e.g. Agrifood Consulting International, 2005; EU-Thailand Small Projects Facility, 2007; Haggblade & Ritchie, 1992; Patichol,

Wongsurawat, & Johri, 2014; Siewsamdangdet, Vemuri, & Bretherton, 2010). To determine its findings, the research included observations of sericulture-related activities at QSSC in Thailand's Chiang Mai province. In addition, four in-depth interviews were conducted with QSDS officials.

Only native Thai and Thai-hybrid silks are used in soap production at a local level. QSDS is the main supplier of native Thai silkworm eggs and the sole supplier of Thai-hybrid silkworm eggs in Thailand (Haggblade and Ritchie, 1992; Siewsamdangdet, Vemuri and Bretherton, 2010; INSERCO, 2013; Patichol, Wongsurawat and Johri, 2014). As a result, the agency has the power to control the flow of silk production across Thailand and therefore plays a vital role in ensuring soapmakers have access to the raw materials they require for soap production.



Figure 6.1 A silkworm rearing room at QSSC in Chiang Mai province.

Fig. 6.1 shows a silkworm rearing room. QSDS developed varieties of silkworm that are resistant to native pests and pathogens (Haggblade and Ritchie, 1992; Agrifood Consulting International, 2005; Boonchoo, 2008; Earth *et al.*, 2008; Patichol, Wongsurawat and Johri, 2014b) and are well suited to local climates and environments.



Figure 6.2 4-month mulberry saplings at QSSC in Chiang Mai province, available for purchase at subsidised prices.

Fig. 6.2 depicts mulberry saplings prepared by QSSC in Chiang Mai. During the period of the research, QSDS sold ten mulberry cuttings (4-month mulberry saplings of 20-30 centimetres in length) for one baht without a container, and three baht with a container. QSDS also offered sheets containing around 20,000 silkworm eggs. These included a variety of breeds of eggs, including Thai native eggs, foreign eggs (Chinese or Japanese), and a cross-bred variety (Thai with Chinese and/or Japanese). These were available at the subsidised rates of 10 baht, 30 baht, and 120 baht per sheet respectively. As shown in Fig. 3.24, during the research farmers were able to order sericulture resources from 21 QSSCs around the country (Haggblade and Ritchie, 1992; Siewsamdangdet, Vemuri and Bretherton, 2010; INSERCO, 2013; Patichol, Wongsurawat and Johri, 2014).

Yayee, an agriculture academic at Chiang Mai QSSC, explained why farmers could not breed Thai-hybrid silkworms themselves:

"We don't let farmers breed Thai-hybrid silkworms themselves as it is a multi-step process which requires additional investment from farmers. If we do it at [QSDS silkworm egg banks], we only have to do it once and no one else has to do it. By doing it this way, farmers get to use good silkworm breeds. If farmers breed silkworms themselves, they may crossbreed varieties and weaken future generations."

She further added:

"Farmers don't have much capital, and if they have to breed silkworms themselves, it will increase their costs. Producing silkworm eggs at QSSC simplifies the process and cuts time and costs for the locals. … We sell farmers silkworm eggs which are just about to hatch so when they buy them, they can get silkworms almost immediately."

This research shows that QSDS' people-centred development approach assisted rural communities by offering regular assessment of their sericulture practices and providing free training. This helped farmers improve the quality of their mulberry leaves and their silk, and ultimately enhanced productivity. QSDS also provided free raw materials for the building of silkworm rearing houses and tools for rearing silkworms.

Yayee commented how QSDS provided sericulturists with the best quality silkworm eggs:

"QSDS has five silkworm egg banks which choose the best silkworm breeds to deliver to 21 QSSCs. There they are crossbred before being sent to farmers."

She further noted how QSDS subsidised the costs of silkworm eggs:

"*QSDS sells sheets containing about 20,000 native Thai and Thai-hybrid silkworm eggs for 10 baht and 30 baht respectively. Production costs are, however, actually about 300 baht."*

This research argues that QSDS directly impacts the economic well-being of soapmakers. Interviews show that to ensure the underprivileged receive access to silkworm eggs and mulberry saplings, the organisation provided subsidies that covered around 90-97% of the capital cost of these resources. These subsidies prevent the private sector from entering this market and allows the government to monopolise Thailand's silk supply industry (Haggblade & Ritchie, 1992). Likewise, QSDS offers free delivery of low-cost silk- and mulberry-related supplies from QSSCs to community enterprises. As a result, enterprise workers who face transportation issues save costs and increase their potential to earn a livelihood in the areas they are from,

something that is especially important in rural areas. As sericin is derived from silk, QSDS's intervention in the cost of silk production influences the capital costs and profit yields of sericin soaps. QSDS's involvement offers enterprise workers the potential to generate increased profits from soapmaking.

Reflecting the gendered nature of the soap commodity chain, this research substantiates existing literature by demonstrating the impact of QSDS on gendered livelihood and development in the soap industry. As an extension of silk production, the soap industry is an area where women often have control and autonomy – a situation that allows them to be empowered economically and socially, and which helps to improve their status within their households. As such, QSDS' initiatives are especially beneficial to mature and elderly women (cf. Sections 7.2.1 and 8.1).

With results that contrast with those of Earth *et al*. (2008), who suggest that men are the major public actors in traditional Isan culture, this research contributes to existing literature by demonstrating that women are the main public actors in the soap industry. Interviews, questionnaires and observations highlighted in Sections 7.1 and 8.1 show clearly that most women engage in soap production and commerce independently of male leadership. Women also collaborate directly with various government agencies they deal with. However, as producing and selling soap is not the sole livelihood strategy of most female enterprise workers, QSDS' impact on improving women's status in Thailand has been limited.

This research further asserts that QSDS plays an influential role in determining the dependency and relationship between sericulture community enterprise workers. Sericulture community enterprise leaders helped members to order mulberry saplings and silkworm eggs from their corresponding QSSCs each month. This was done to save time and reduce operational costs for both community enterprises and QSSCs. QSSCs would send their supplies to the villages on four-wheel trucks, with eggs kept at 25°C and mulberry plants at an ambient temperature. The goods were then dropped at the leaders' houses ready for members to collect at their convenience. Huaysai, Chumtabong and Nayaw-NaUdom sericulture community enterprises used silkworm eggs and mulberry saplings from QSSCs in Nakhon Ratchasima, Saraburi, and Buriram provinces respectively.

These three QSSCs are governed by the Nakhon Ratchasima Queen Sirikit of Sericulture Office in Nakhon Ratchasima province. However, Poethong Charoen enterprise ordered its eggs and saplings from QSSC in Chiang Mai province, which is governed by the Queen Sirikit of Sericulture Office in Phrae province.

This research argues that QSDS helps to stimulate both the supply of and demand for silk cocoons on the national market. Thai sericulture community enterprises took advantage of being able to both obtain silkworm eggs from QSDS and use them for any purpose they wished – a situation that contrasts with restrictions placed on rearing silkworms purchased from private factories (Siewsamdangdet et al., 2010). Silkworm rearers could even sell silk cocoons back to QSDS if they wished to. Besides this, QSDS officials would go to villages to purchase silk cocoons, quoting current prices based on cocoon weights.

The level of freedom experienced by farmers involved in producing silk from local silkworm breeds differs sharply to that experienced by farmers who reared foreign silkworms for silk textile factories. Typically, these farmers had to rear third stage larvae and sell all silk cocoons back to the factories within around 15 days. Companies enforced specific protocols to control silkworm rearing, and cocoons had to meet strict standards before companies were willing to purchase them. However, community enterprise farmers dealt with breeds that had shorter rearing cycles. As a result, they could earn money more quickly than farmers selling directly to QSDS.

The possibility of improved cashflows has led many farmers to believe rearing foreign silkworms is more lucrative than dealing with local breeds. However, their incomes are still constrained by the market price of foreign silk cocoons, which is set by the market. In addition, their ability to produce cocoons is still dependent on environmental conditions and rearing practices.

Because of a restricted budget and limited workforce involved in silkworm egg production, there is a limit to the organisation's ability to increase supplies to meet public demand (Haggblade & Ritchie, 1992). For this reason, many households have had to continue breeding native Thai silkworms by themselves. This study thus argues that even though they can profit from selling silk-related products, the constraints on QSDS's supply

mean farmers are unable to rely on this activity as their sole source of income. This corresponds to the fact that many soapmakers still choose to diversify risk by being involved in farming, raising livestock, and weaving silk. Nonetheless, this research agrees with the literature which shows that QSDS enables farmers to sustain their lifestyles in their own communities by allowing them to both farm and engage in sericulture. (NESDB and the World Bank, 2005; Morton, 1989; Earth et al., 2008). As such, QSDS plays an important role in enhancing the identity and value of Thai silk in the Thai society, sustaining the culture and traditions of silk production in rural communities.

As suggested earlier, while QSDS primarily intervenes in the silk supply in the upstream value chain of sericin soap, this research argues that the agency also takes the role of 'educator', transferring soapmaking knowledge to rural sericulture communities when they request assistance. This kind of public support was also provided by TINT, BEDO and CT. However, QSDS' efforts to share knowledge related to soapmaking were not as prominent as those of the other three organisations, which made extensive visits to sericulture communities to teach locals how to diversify sericin. This might partly be because other government agencies had already provided these communities with assistance. While this agency had a policy to support diversified silk markets, the silk textile industry has existed for a much longer period in Thailand, and as a result, sericin soapmaking was not yet a primary QSDS project (QSDS, 2015). As a result, to avoid 'saturation', QSDS focused on providing assistance in other silk-related activities.

Findings show that the main obstacles faced by QSDS when implementing development plans in local communities stem from differing attitudes, beliefs, and readiness to accept change. Whether related to education level, or individual preference, these issues can directly impact individuals' potential for economic advancement, and their impact on their environments.

Nanat commented about locals' attitudes when being trained by QSDS:

"Just asking them to change their silkworm rearing methods is difficult enough. This is about attitude, belief, and acceptance of change. For instance, if we talk to them about using fertilisers and insecticides on plants,

they often don't follow the instructions. This is because they don't really believe in them. Sometimes, their reluctance to apply fertilisers is simply because they do not want to spend a lot of money. They just think that their plants are fine, and they take it for granted. In addition, when we tell them that they have to use separate tanks and spray nozzles for herbicides and insecticides, they may not listen and might kill their plants."

This research argues that QSDS assumes a role of 'market facilitator' in the soap market by helping community enterprises get more recognition for their products in a variety of markets. This helps enterprises to increase their customer base and generate additional revenue.

Interviews show that QSDS offered sericulture community enterprises free booths at its national fairs. The free booths enabled sericulture community enterprises to promote and sell their handmade silk fabrics and other silk-related products at the same events. These related products included sericin soap. As such, QSDS was integral to facilitating the soap trading market.

"*QSDS arranges annual royal silk fairs which emphasise the sale of silk fabrics. We select groups of farmers to sell their products at the fairs. However, other products like sericin soap are also sold," said Nanat, a QSDS official.*

QSDS promotes Thai silk textiles more extensively than ancillary products, and, as this industry has been supported by the Royal Thai government since 1861 (EU-Thailand Small Projects Facility, 2007; Brown, 1980; QSDS, 2015), this is only to be expected. Silk is considered an essential part of Thailand's national identity and heritage (Brown, 1980; Conway, 1992; Jory, 1999; Earth *et al.*, 2008; Sawasdee, Yodmalee and Phaengsoi, 2015). The silk sector represents one of the country's most important import and export industries (INSERCO, 2013; Marella, 2013; Patichol, Wongsurawat and Johri, 2014).

As QSDS focuses on the promotion of Thai silk textiles, this detracts from their ability to promote Thailand's silk-based cosmetics sector, and even though it is part of the organisation's official strategy (QSDS, 2015), QSDS has found it difficult to encourage silk farmers to add to the value of silk in

other 'non-textile' sectors. As a result, only a few community enterprises have been successful in producing and trading silk-based cosmetics.

As QSDS plays an integral part in bringing silk-related products to market (including market facilitation from production and marketing), this research asserts that the organisation helps minimise socioeconomic inequality between urban and rural areas in Thailand, and therefore enhances the employment opportunities and incomes of rural community enterprise workers. This is particularly beneficial for residents of the North and Northeast regions of Thailand which have high concentrations of silk production and are amongst the poorest areas of the country (Agrifood Consulting International, 2005; Haggblade & Ritchie, 1992).

This study fills the gap in the literature by using the *Follow the Thing* approach as a political tool to examine the strengths and weaknesses of QSDS. Following the soap chain highlights the organisation's indispensable role in the upstream soap value chains at the village level. Likewise, it also demonstrates that QSDS helps to increase the capacity of sericulturists, sericulture community enterprises, and soapmakers and traders, thereby encouraging both individual and group independence, and stimulating the local economy. Arguably, its drawback is that farmers cannot become independent from government assistance because QSDS is their main supplier. This limits private enterprise and can be a source of insecurity or threat in the sericin soap business. Likewise, political and financial disruptions can affect how QSDS supports farmers, meaning that individuals and enterprises could be forced to adjust their business models if there is a change in government or government policy. As in other areas of business, when the business environment changes, adaptation is required to ensure survival.

6.2 Roles and Impacts of the Thailand Institute of Nuclear Technology in the Soap Commodity Chain

The roles and impacts of the Thailand Institute of Nuclear Technology (TINT) are examined because this agency initiated the current soapmaking approach where sericin is extracted using a HTHP degumming method. The organisation is also involved in sharing technology and providing training among rural sericulture communities in Thailand.

This study conducted three in-depth interviews with officials from the Ministry of Science and Technology (MOST) involved with both TINT and CT. Using the *Follow the Thing* approach, the study substantiates current literature by highlighting TINT's roles of 'educator and community developer' in the soap value chain. It also fills gaps in studies which neglect the roles and impact of this organisation in the soap value chain (TINT, 2010; QSDS, 2013; Clinic Technology, 2014; Neal, 2014).

Chawalit, a policy and project analyst of MOST who oversaw all CT projects, stated:

"Actually, an irradiation method was originally used as an approach to extracting sericin. This involves using the 'spray dry' method to convert sericin water into powder, and then irradiating the powder to produce sericin 'nanopowder'. However, the technology used in this approach is prohibitively expensive – it costs 2 to 3 million baht to buy the proper equipment. So, the TINT research team looked for a method which was easier and more cost effective. They discovered that a pressure pot could be used to extract sericin from silk. This is why this approach is used now."

Based on a request from QSDS to find ways of creating more value added from silk wastewater (TINT, 2010), TINT originally chose an 'irradiation method' to make sericin nanopowder for cosmetics, agriculture, and biomedical purposes. However, high operational costs and lack of equipment meant this approach was not appropriate for rural community enterprises, and this led to the organisation promoting the HTHP degumming method instead. Many rural sericulture communities adopted this soapmaking method because of its low-cost and ease of preparation.

Malee, a BEDO official, said:

"MOST shares information about sericin's cosmetic properties with the public and local communities. They were first to arrange workshops where locals could learn how to extract silk protein and produce soaps, shampoos and conditioners."

This research argues that TINT assumes a role of 'educator and community developer' by educating rural sericulture communities in the processes and

procedures related to soap making. Once TINT officials have taught locals how to produce soap, the agency moves on to help other communities that have shown an interest in the area or have requested assistance. This means most communities have an equal opportunity to learn soap-making techniques. As presented in Section 7.2.1, this ability to request assistance means people with differing socioeconomic backgrounds have equal soap-making skills. This in turn helps to diminish socioeconomic disparities and reduces socioeconomic inequality within communities. To do this, TINT adopts a people-centred development approach to helping rural communities. The agency taught locals directly, instructing them how to produce pure sericin for soapmaking using the environmentally friendly HTHP method of degumming silk yarn – a method that is inexpensive and minimises damage to the silk yarn used in weaving silk (Javali et al., 2015; Fabiani et al., 1996).

The research maintains that the organisation's ability to share soap-making technology and knowledge plays a valuable role in empowering rural women. As with the QSDS' initiatives, this research shows that most of those benefitting from TINT's soapmaking project were mature to elderly women (cf. Sections 7.2.1 and 8.1). However, the extent of this impact varies according to the individual and depends on their practices and their attitudes toward learning and accepting change. These limitations are impacted by education levels and cultural norms.

Interviews show that a research group from TINT taught soap production to members of Huaysai, Nayaw-NaUdom and Chumtabong community enterprises in their rural villages. The fact they had received this support spurred further assistance from BEDO and CT, which offered input in areas that had not initially been covered.

Yongyuth, a CT manager from NRRU who supervised Huaysai Enterprise, commented:

"We know that this [Huaysai] community normally degums silk using [sodium carbonate], but we know that sericin is beneficial, so we want to support this community in making sericin soap and lotions. We achieved this by collaborating with TINT of MOST. They shared their technology and cosmetic production methods with [Huaysai] community. We also taught the

community how to diversify their cosmetic formulas, and how to make their formulas more stable. With support from either CT or MOST, the community has progressed."

Similarly, Pisut, a BEDO official, noted:

"We noted that [Chumtabong enterprise] was involved in sericulture and silk weaving. Before we went to assist them, this group was using sericin water to make soap and shampoo. They did this using knowledge and methods common to community members. We were impressed by the fact that they used waste to add value to their community, so we decided to support their efforts."

The impact of the assistance BEDO and CT offices provided helped producers to stabilise and improve their soap formulas, broaden their cosmetic lines, improve their packaging and logos, and expand their trade routes. Additionally, they also engaged in marketing on behalf of the enterprises (TINT, 2010; Clinic Technology, 2014; Neal, 2014).

With a strategy that only allows it to intervene upstream in the soap value chain, TINT's organisational strategy does not enable it to engage in any type of trading or marketing on behalf of enterprises, only permitting its involvement in knowledge and technology transfer with local communities (Laoharojanaphand *et al.*, 2016; MOST, 2017). In contrast, BEDO and CT can engage in both upstream and midstream industries. Despite these restrictions, other agencies benefitted from TINT's soap-making knowledge and technology, and soapmaking became a model for agencies to adopt or extend the same technology in a wider area.

Despite initiating the production of sericin soap in Thailand, no comprehensive data currently exists delineating the locations of the communities TINT assisted or detailing how their assistance impacted these communities. Such data is more likely to be found when communities are supported by agencies with long-term community projects which track progress on a regular basis.

This research argues that TINT has helped rural communities reduce the environmental impacts of pollution caused by silk wastewater. It has done

this by persuading sericulturists to abandon the use of sodium carbonate when extracting sericin and promoting the use of HTHP pressure pots as an alternative. This was achieved by offering an economic incentive which resulted in a reduction in the impact of land and water contamination (Haggblade and Ritchie, 1992; Fabiani *et al.*, 1996; Aramwit, Siritientong and Srichana, 2012; Javali *et al.*, 2015). However, the research also asserts that the degree to which environmental pollution is minimised in the soap commodity system is dependent on individual practices and lifestyles that are influenced by several factors. These include environment, culture, socioeconomic background, and chain actors' interdependencies (see Chapters 7, 8 and 9). There is, therefore, a limit to the extent TINT's soapmaking technology and approaches can help to conserve the environment at sericulture communities.

6.3 Relationship and Interdependence between Government Agencies in the Soap Commodity Chain

SMCE and OTOP policies focus on job creation and the alleviation of poverty in rural communities. This research fills the gap in the literature by demonstrating the symbiotic relationship between the four government agencies involved in the soap commodity system (QSDS, TINT, BEDO and CT) as far as these objectives are concerned.

This research maintains that government agencies select community enterprises to support based on enterprise leaders' characteristics and capabilities, how well agencies' expertise meets the needs of an enterprise, and the likelihood their products will meet the demands of the market (market responses).

Interviews show that having strong community enterprise leaders influenced government agencies to support community enterprises in the sericin soap business. This is partly because the positions they held within their enterprises gave them the authority to lead the group to succeed in completing projects, to make decisions on behalf of their members when necessary, and to secure deals with government agencies and clients in favour of their groups. To make deals that stakeholders feel satisfactory, these leaders require negotiation and leadership skills alongside a genuine understanding of consumer markets, community enterprise operations and community enterprise capacity. Besides this, these leaders also assumed the

role of community enterprise traders who assisted in managing and controlling their members' soap production rates and often found soap markets for their groups.

Nanat commented on situations where QSDS would be more likely to assist sericulture communities in setting up a soap business:

"If a sericulture community is interested in setting up a soap business and has a strong community enterprise leader, they will manage to reach their target groups. If not, we will have issues with them competing in the market. If we see their potential, we will consider whether the community has the capability to progress. Some families in some communities are quite traditional and tend not to accept change. … There are only a limited number of farmers that have the motivation needed to succeed."

Chawalit, a MOST official who oversaw all CT projects, made similar comments:

"For any community enterprise to progress largely depends on community enterprise leaders. If leaders are interested in their enterprise's progress and development, they can motivate their members to improve. The main issue is that we have to evaluate community enterprise heads to determine whether they have the potential to develop or not. For instance, when Huaysai community enterprise received training from TINT (before the CT office assisted the group) they were monitored by officials who were university lecturers. These officials recognised the enterprise leaders' potential and saw that this group had the potential to do well in sericulture and diversifying silk."

Likewise, Pisut, a BEDO official who supervised Chumtabong enterprise, stated:

"When we try to develop community enterprises, we cannot only focus on issues like resources, tools and location. This would be counter to theories prevalent in developed countries. Instead we need to focus on human capital. With qualified human capital we can be confident there will be a positive outcome. Regardless of physical and natural assets, if we don't have the human resources necessary, the project won't work. Likewise, if we want

to deal with communities effectively, we need leaders who have the vision and determination to do what needs to be done to be successful."

This research argues that to be trusted by the Thai government as part of its community development projects, community enterprise leaders need to be 'organic intellectuals'. Organic intellectuals are developed by being insiders of a business environment that is both inside and outside their communities and addresses their standpoints, interests and experiences (Gramsci, 1971). Gramsci (1971, p.9) suggests that an organic intellectual is a performer with a social role within society who engages in 'active participation in practical life as constructor, organiser, permanent persuader and not just as simple orator'. With a good understanding of their business operation and community contexts, community enterprise leaders gained the trust of their members and helped lead them to achieving both commercial success and the goals of the community development project. Nevertheless, enterprise success and the ability to achieve collective goals are still dependent on collaborative effort and the ability of enterprise members to follow their leaders' directions (Davies, 2007). This contrasts with traditional intellectuals who have roles and positions in society (such as lawyers, priests and teachers) that are shaped by aristocracy and allow them to exert authority over knowledge (Gramsci, 1971).

Pisut, a BEDO official, clarified how his organisation's expertise led them to support enterprises that produced natural cosmetics:

"Historically, the BEDO working group has supported community enterprises that are involved in the beauty industry. As a result, we have established collaborations and networks with researchers involved in the cosmetics field. However, BEDO only supports organisations with products that include raw materials available in their communities. One group might produce cosmetics that contain honey, while another might produce cosmetics that include turmeric. BEDO only supports enterprises with products that contain unique materials and they must be materials they can get from their own communities. As a result, we only support one group that retails silk-based cosmetics. With our background it's natural for us to go on and support other organisations in the cosmetics sector and we have supported several groups selling natural cosmetics."

Then, Chawalit, a MOST official, commented on the influence of market responses in driving their projects:

"We attempt to use a market driven strategy to drive all projects. We are trying to let the market lead us. If locals produce products they cannot sell they won't be able to survive."

This study contributes to the broader literature by demonstrating how government agencies' community outreach assistance is shaped by the characteristics of enterprise workers, enterprise leaders and community enterprises.

This research further maintains that through their assistance in funding, education, production, trading and marketing, each of the four agencies has contributed to community and women's empowerment in Thailand's rural areas. This has particularly impacted mature/elderly women, who are now in a better position to support themselves, and also more able to support their families and communities. To the extent possible, government agencies bring positive socioeconomic impacts to the communities.

Although the agencies may on occasions share knowledge and technology, and on some occasions collaborate, this benefit has been achieved despite the fact that the four organisations generally work independently of each other when assisting rural sericulture communities. That said, the extent to which they operate independently is dependent on how they impact or influence each other in the soap value chain. As such, some agencies may benefit from this interdependency more than the others.

As has been seen, there can be some overlap as far as the four agencies supporting the same community enterprises is concerned. This overlap is caused by the specific nature of outreach activities, issues like geographic location, and specific areas of expertise amongst the agencies. When overlap has occurred, each organisation's approach to community development is based on its own policies and expertise. This research suggests, however, that regardless of approach, each of the four agencies had the same points of contact at community enterprises.

This research shows that the government agencies studied preferred to support cooperatives with knowledge, technology sharing and funding rather than supporting individuals. This is partly due to the '2005 SMCE Promotion Act' which forced agencies to specifically support community enterprises (MOAC 2005). However, another reason is the need for agencies with limited workforces and budgets to use resources efficiently.

Suwee, an agriculture specialist from the Saraburi QSSC, stated why QSDS preferred supporting cooperatives instead of individuals:

"If we support individuals, we have to pay a lot for equipment costs. However, if locals gather as a group, they can share resources and enjoy the benefits, which is a good thing. As a group, they can also concentrate on transferring their skills and knowledge to their communities."

This research argues that QSDS achieves its 2013 policy goals of supporting the sericin-based cosmetic sector in Thailand (QSDS, 2013). This achievement was the result of outreach activities provided by TINT, where soapmaking technology was shared amongst rural communities, and the activities of both BEDO and CT, which supported sericulture community enterprises in production, marketing and trading.

This research further argues that QSDS depends on the credibility of TINT's research in terms of methods of sericin extraction and the applications of sericin in cosmetics and other industries (Zhang, 2002; TINT, 2010; Javali *et al.*, 2015). This ability to leverage of TINT enables QSDS to encourage community enterprises to create more sericin-based cosmetics (TINT, 2010; QSDS, 2013).

Being the sole distributor of silkworm eggs and mulberry saplings, QSDS played a crucial role in sustaining silk production in all sericulture communities. They shared the same point of contact as other agencies when supporting enterprises at different stages of the value chain.

In the soap value chain, both CT and BEDO intervened in both upstream and midstream soap value chain (cf. Section 8.3). Alongside limited knowledge and a lack of market information, some of the producers had limited funding and transport options. As a result, these two agencies helped producers to

connect with the market. This research therefore fills a gap in the literature by illustrating that the soap value chain involves government agencies that have similar and differing roles as far as influencing various aspects of the chain is concerned.

This research maintains that the level of support community enterprise received from agencies may determine the extent to which they can develop and succeed in the market. As mentioned previously, this research suggests that when a community enterprise received the support of one government agency, other agencies were likely to fill any gaps by offering additional support.

Pisut commented about the BEDO role in assisting community enterprises:

"We are an organisation that helps communities move forward in less time. Nevertheless, there are existing organisations whose mission is to help communities. Because there so many communities, we have to help the most interesting ones first. When other government units see the fiscal balance and smooth progression of a particular community, they might also provide assistance. For instance, some provincial organisations provide budgets for communities to build factories. BEDO helps to draw the attention of related organisations, and they often choose to assist in such efforts."

As both CT and TINT are under MOST and share the same policies (Laoharojanaphand *et al.*, 2016; MOST, 2017, no date), this research asserts that the level of interdependence between CT and TINT is greater than that between BEDO and TINT.

"*CT offices assist in creating markets and developing marketing for community enterprises. For instance, [community enterprises] can sell their products at science festivals. We also have labs to test their product quality so they can meet industry standards. Likewise, we also have a packaging centre which designs and tests packaging," said Chawalit, a MOST official.*

CT originally received input and technology related to soap production from TINT. This is because they intended to assist rural communities in areas required by locals by utilising existing research, technology and resources under its ministry. In contrast, to enable Chumtabong to differentiate its

products from those of its competitors, BEDO independently hired a research group from Thailand's Rajamangala University of Technology to design specific sericin-based cosmetic formulas and packaging for Chumtabong community enterprise (BEDO, 2019).

This research argues that the intervention of various government agencies in the soap value chain is required because they have different aims, objectives and varying levels of ability to support rural community development. The similarities and differences in their approaches help to negate possible weaknesses and result in strengthened support for communities (Seixas and Berkes, 2010). This study further asserts that despite lack of coordination and collaboration, each government agency has its own unique role, and they complement each other in supporting the success of rural sericulture community enterprises.

This research maintains that without government intervention, sericulture community enterprises are likely to be exploited by intermediaries who might impact their competitive advantage and their ability to generate profit. Other possible issues might be the constraints on rural communities' abilities to scale up production and expand trade routes. These issues might lead to soap consumption being confined to specific geographical locations, which in turn might limit soap trading profits and negatively impact traders' and soapmakers' economic well-being.

This research asserts that while government agencies have similar goals as far as community development is concerned, conflicting operational management approaches make it difficult for them to share resources and knowledge in an effective manner. Alongside lack of trust amongst advocates for cooperative projects, this might be due to differing mandates, organisational cultures and visions (Genefke and McDonald, 2001; Lackey, Freshwater and Rupasingha, 2002; Hawkins, 2010; Ödlund, 2010). Additionally, lack of resources might make it difficult for one agency to cooperate with another (ibid).

Interview findings show that the four government agencies (QSDS, BEDO, TINT and CT) involved in the soap commodity system rarely shared information on best practices. Additionally, they often lacked coordination and were not generally involved in collaboration, especially when they were

under different government ministries. As a result, regardless of whether they are dealing with communities in the same geographical locations, each organisation has its own strategies and approaches to assisting rural communities. Arguably, this might cause some of the support villages receive to be redundant. Agencies operating in the same areas might waste budgets and resources that could be used to tackle issues in other communities.

Chawalit, a CT official, pointed out issues when collaborating with other agencies:

"Sometimes we had projects which covered the whole supply chain. Some of the local institutes weren't able to support the projects they needed to support. Some local authorities resist learning something new to help local people; they just use methods they are used to. Because of this, when we offer locals an alternative approach, they are worried about whether it will work or not. As a result, they can't put their full effort into developing their area."

While the original intention of soapmaking was to ensure that silk wastewater would not be released on land, other environmental impacts of the soap value chain are still largely neglected by government agencies. This research reveals that there was no clear or obvious environmental assessment of the soap value chain from any agency prior to its transfer to communities. It should be noted that BEDO and CT did put some effort into encouraging locals to minimise the environmental impacts in silk and soap production by using fewer chemicals and recycling waste (cf. Sections 7.2.2 and 7.2.3). This though does not mean the soap value chain is environmentally friendly, particularly when nothing is in place to monitor the practices of individual soapmakers, traders, or even the practices of consumers. This research therefore argues that lack of consideration of environmental conservation in the planning and implementation phases of the soapmaking projects supported by Royal Thai government agencies might mean they contribute to environmental degradation.

6.4 Summary

This research has considered the roles and impacts of two government agencies which intervene upstream in the soap value chain: QSDS and TINT.

Both agencies adopt a people-centred approach to their community development projects. Furthermore, the research has also considered their relationship and interdependence with the other two agencies: BEDO and CT which also intervene in both upstream and midstream soap value chain.

This research has shown that government agencies generally select community enterprises to support based on characteristics and capabilities of community enterprise leaders, the extent to which their expertise matches the enterprise needs and market responses.

This research has demonstrated that QSDS assumes the roles of 'educator and market facilitator' in the soap value chain. Its educational role allows farmers to improve their silk production whereas its facilitating role creates an enabling environment where soapmakers have continuous access to silk and sericin and provides free venues where soapmakers can sell their products.

This research has shown that TINT assumes the roles of 'community developer and educator'. It empowers rural people by giving them insights into low-cost soap making processes and procedures that aid job creation and income enhancement.

This research has also presented that all four agencies (QSDS, TINT, BEDO and CT) help to minimise socioeconomic inequality within and between rural communities. As they help to build local capacity, these agencies also empower rural people, especially to mature/elderly women who mainly benefit from their supports and increase their incomes.

Both CT and BEDO assist rural sericulture communities in the production, marketing and trading of soap. They also fill gaps that have been left in the support provided by QSDS and TINT. They connect soapmakers with the market and expand soap markets in areas where lack of knowledge, market information, funding and transport options have been obstacles for producers. The roles and impacts of CT and BEDO as traders in the soap value chain are further discussed in Section 8.3.

This research has pointed out levels of interdependency and symbiosis between four agencies: QSDS, TINT, BEDO and CT. These agencies

interrelate in the soap commodity system in a variety of spaces and places, and, as they all aim to develop rural communities, alleviate poverty, and serve national SMCE and OTOP policy goals, in general, their practices are complementary and benefit each other.

As both TINT and CT share the same policy focus under Thailand's MOST, this research has demonstrated that the levels of interdependence between these organisations is greater than that between TINT and BEDO. TINT does not assist in trading and marketing of soap for any of the community enterprises. Its soapmaking projects therefore require the involvement of other government agencies to ensure enterprises can be successful in the soap industry.

Likewise, QSDS relies on the outreach activities of other government agencies to share soapmaking techniques and support community enterprises in marketing and trading to achieve its 2013 policy objectives.

This research has also shown that there was no environmental impact assessment of the soap value chain by any agency prior to soapmaking technology transfer. Although TINT's introduction of the HTHP degumming process was designed to reduce the environmental impacts of traditional degumming approaches, other environmental impacts of the soap value chain are still neglected by government agencies. Despite this, the degree to which environmental pollution is minimised in the soap commodity system depends on individual practices and lifestyles which are influenced by environment, culture, socioeconomic backgrounds, and chain actors' interdependencies (see Chapters 7, 8 and 9).

This research has shown that in spite of attempting to achieve the same goals of rural community development and poverty alleviation, government agencies often lack coordination and collaboration. This might be due to different mandates, cultures, and visions across government agencies, or due to lack of trust amongst advocates of cooperative projects. Another factor could be that different resources are available to particular agencies. Each of these factors can hinder cooperation and coordination.

This research has revealed that without government intervention, sericulture community enterprises are likely to be exploited by intermediaries who will

reduce their competitive advantage and their ability to generate profit. Additionally, issues of scalability and constraints on rural community enterprises' ability to expand trade routes might mean that geographies of soap consumption could be confined to particular places. Consequently, this may affect the profit generated by traders and soapmakers.

This research concludes that intervention in the soap value chain by multiple government agencies is necessary and beneficial because these agencies have different aims, objectives, and capabilities in supporting rural communities. They can therefore resolve each other's weaknesses and strengthen support offered to communities in the soap value chain.

By following the soap chain, this study contributes to existing literature by using a *Follow the Thing* approach as a political tool to understand what areas government agencies have addressed and neglected in the chain. The intent is that given the information and analysis presented here, the Thai government will be able to tackle these issues more effectively.

CHAPTER 7-THE VALUE CHAIN 2: SERICULTURE COMMUNITY ENTERPRISES AND ENTERPRISE MEMBERS

This chapter aims to define the roles and socio-environmental impacts of sericulture community enterprises and enterprise members involved in the upstream soap value chain. It is divided into three sections: 1) Roles and Impacts of Sericulture Community Enterprises, 2) Following Soap Production, and 3) Impacts of Soap Production.

7.1 Roles and Impacts of Sericulture Community Enterprises

This research examined four sericulture community enterprises in which three enterprises (Huaysai, Nayaw-NaUdom and Chumtabong) produced handmade sericin soap alongside silk and the remaining one (Poethong Charoen) chose not to produce soap. This research substantiates the literature by considering the roles and impacts of sericulture community enterprises in several areas. These include 1) community enterprise management practices, 2) characteristics of enterprise members, 3) government support, 4) operational soapmaking styles, 5) obstacles faced by enterprise members, 6) profit-sharing schemes that apply to the enterprises, and 7) the contribution enterprises make to their respective communities.

7.1.1 Management Practices of Community Enterprises

To join a sericulture community enterprise, villagers must first register. While registration for Poethong Charoen and Chumtabong enterprises was free of charge, Huaysai Enterprise required a one-time membership fee of 25 baht, and Nayaw-NaUdom Enterprise required its members to purchase at least one share at a cost of 300 baht. Each share purchased allows members to receive a yearly dividend based on Nayaw-NaUdom's enterprise profits.

This research argues that community enterprises operate using different management styles, and as a result, offer members different benefits. One factor influencing enterprise management style is varying levels of business literacy amongst enterprise members. Business literacy itself is influenced by a number of factors including literacy and numeracy skills, and features

like local context (Atkin and Merchant, 2004; Atkin, 2010). The social norms which shape members' preferences towards certain practices also play a role (Sunstein, 1996), as does culture, which shapes locals' abilities to create, share and use knowledge (De Long and Fahey, 2000).

Huaysai and Nayaw-NaUdom enterprises were originally formed by sericulturists wishing to produce and trade silk textiles. As members elect their leaders democratically every 2-4 years, they were defined as being community-led businesses. By contrast, both Poethong Charoen and Chumtabong enterprises were private businesses established by their leaders.

Each community enterprise had a president and a vice-president to manage enterprise affairs. To help them run smoothly, the enterprises also had committees and other leadership roles that included secretary and treasurer. Enterprise members were generally voted into these roles, especially in community-led enterprises. In all case studies, leaders also assumed 'community enterprise trader' roles where they helped members sell products produced by the enterprise (cf. Section 8.1).

7.1.2 Characteristics of Community Enterprise Members

The majority of sericulture community enterprise members involved in the study were farmers (Nhonghong Agriculture Organisation, 2005; Chaimongkon, 2013; Clinic Technology, 2014). However, while only around half of Poethong Charoen enterprise members were engaged in agriculture, more than 80% of the members of Huaysai, Chumtabong, and Nayaw-NaUdom enterprises were farmers (Nhonghong Agriculture Organisation, 2005; BEDO, 2013; Chaimongkon, 2013; Nhong Manaw Sub-district Administrative Organisation, 2015).

This study shows that the location of communities in relation to industrial districts affects local job diversity. Part of the reason why fewer Poethong Charoen community enterprise members were involved in agriculture is its location. Near a town, the community has more access to public transport than the other communities. As a result, Poethong Charoen enterprise members were less constrained in terms of employment opportunities. Research has suggested that proximity to a main road has been a leading factor in influencing the extent to which locals move to 'off-farm' jobs in the

suburbs of Chiang Mai province (Rief and Cochrane, 1990; Singhanetra-Renard, 1999). However, factors like personal backgrounds, education, environment, social influence, cultural values (from society, occupation and organisation) and personal preferences also affect career choice and commitment to particular types of employment (Schein, 1984; Turban, Eyring and Campion, 1993; Lent and Brown, 1996; Shah, 2005; Stone, Isenhour and Lukaszewski, 2008; Kulkarni and Nithyanand, 2012; Novakovic and Fouad, 2013).

This research supports Falvey (2000) who notes that agriculture shapes the Thai identity and supports the lifestyles of the Thai people. The research suggests that regardless of gender, farmers in Thailand produced rice for their own subsistence and for commercial reasons (Falvey, 2000; Ekasingh *et al.*, 2008; NSO, 2013). As Thai farmers have a deep association with rice culture this is only to be expected (Silcock, 1970; Falvey, 2000). However, to improve their incomes farmers at Huaysai, Chumtabong and Nayaw-NaUdom enterprises also cultivated cash crops like sugarcane, cassava and maize (Khong District Office, no date b; Morton, 1989; Nhonghong Agriculture Organisation, 2005; Ekasingh *et al.*, 2008; Chaimongkon, 2013). To some extent this was a result of the Thai government's efforts to encourage farmers to diversify their produce (Ekasingh et al. 2008).

This research contributes to the broader literature by highlighting the gendered nature of livelihood and gendered division of labour in soap production. The research also considers the role gender plays in managing environmental resources in specific geographies. The four case studies conducted during the research show that enterprise members were predominantly female, with only Poethong Charoen enterprise led by a male.

This research argues that the gender of enterprise leaders influences the activities that community members engage in. Female-led community enterprises tend to engage in silk weaving and soapmaking while male-led community enterprises focus on silk production and mulberry cultivation. This is probably because silk weaving and soapmaking are traditionally recognised as female occupations. Poethong Charoen was unique in that it only sold organic silk cocoons and organic mulberry leaves. This is because the leader of Poethong Charoen believed that the organic silk cocoon and mulberry leaf markets were more profitable than selling silk textiles and

soap. In addition, members of Poethong Charoen were inexperienced in producing silk textiles and making soap unlike other enterprises.

Unlike the other three communities involved in the study, silk production and weaving were not part of Poethong Charoen enterprise's culture, and this was probably a key factor in explaining why it did not focus on these activities. Aside from drought issues, farmers there did not have enough land to cultivate mulberry leaves or rear silkworms. As a result, only two or three Poethong Charoen enterprise farmers actively produced silk, considerably fewer than at the other communities involved in this research.

Metawan, an agriculture officer at Chiang Mai QSSC, said:

"Few people in the Northern region are involved in sericulture and I think this is because they have a number of occupations to choose from. Likewise, they have a lot of choice as far as what they can grow on their farms is concerned. Although silk production is a tradition in the Northeast of Thailand, many people in the North associate silk production with killing insects, which is a sin."

Chatree, a Poethong Charoen enterprise head, explained why only a few members engaged in silk production:

"It's partly because there has been a drought over the last two or three years and farmers haven't got enough mulberry leaves to feed their silkworms. Additionally, sericulture is not really part of the local tradition, and people might not really understand it in the same way people in the Northeast of Thailand do. There they were born into it."

As they are based in the northeast of Thailand, mulberry cultivation and silk production were firmly part of tradition and culture at the Huaysai and Nayaw-NaUdom communities. This also applied to Chumtabong village which is situated in the central region. The ancestors of Chumtabong enterprise members migrated from the northeast of Thailand and the community still maintains a silk tradition (Kamtam, no date). As a result, during the research they continued to cultivate mulberry and produce silk despite facing drought-related issues and unfavourable environmental conditions.

Sudjai, a 76-year-old female Huaysai sericulturist, explained what sericulture meant to locals:

"People here like being involved in sericulture. They want to send their children to school, so they sell silk. They don't do it because they have to, but because it's in their nature. They also produce silk to wear themselves and to sell to others."

Reflecting the gendered division of labour, most soapmakers were middle-aged to elderly female sericulturists living in the villages where they were born. They generated additional income by extracting sericin from their own silk to produce and sell soap. As touched on previously, they were primarily occupied as farmers (Agrifood Consulting International, 2005; Boonchoo, 2008) and relied on their income from selling crops. They supplemented this income through involvement in sericulture and raising cattle, pigs, and chickens both for sale and for their own consumption (Kamtam, no date; Khong District Office, no date; MOAC, no date; Nhonghong Agriculture Organisation, 2005). Appendix 5 presents schematic maps of all study sites.

Compared to women, men prioritised farming and animal husbandry over producing soap. They preferred farming because it required less attention to detail, and as it requires greater physical strength, it is regarded as being more masculine. However, farming is still a family business and to minimise costs both men and women help each other in the field (Falvey, 2000). In contrast to farming, soap making was considered an extension of silk production. As silk production is dominated by women, it is considered a 'female' activity, especially in the Northeast of Thailand (Naenna, 1984; Haggblade and Ritchie, 1992; EU-Thailand Small Projects Facility, 2007).

This research is in accordance with Jewitt's (2000) findings that suggest gendered divisions of labour in rural communities are related to cultural norms, knowledge, individual personalities, agroecological factors, and age. One prevailing feature of Thailand's silk industry is women being central to silk production and weaving (Earth et al., 2008). Taking it as their hobby and job, rural women wove silk in their free time and produced fabrics to use for both everyday apparel and for clothes for more important occasions like ceremonies (Haggblade and Ritchie, 1992; Payanun, 1995; Agrifood Consulting International, 2005; Boonchoo, 2008; Earth *et al.*, 2008;

Siewsamdangdet, Vemuri and Bretherton, 2010). Of course, limited disposable income was an important factor in women producing silk, but for others the inconvenience of travelling outside their villages to buy clothes played a role. Only a few soapmakers in the study were male. Generally, they did not make soap to sell, rather they made it to reduce their partners' workload and for use in their own households.

This research asserts that males and females have equal opportunities to be selected as heads of sericulture community enterprises. While enterprise leadership roles were predominantly held by women, interviews suggest that gender was not a major factor in people being voted into these roles. Likewise, issues of age and wealth are not the main factors when choosing leaders which contrast with Markelova and Meinzen-Dick's (2009) study. Rather, enterprise members chose their leaders based on their capabilities, knowledge, and how well they managed their tasks in the enterprise.

Yongyuth, a Clinic Technology official, commented:

"It doesn't matter what gender the head of the enterprise is. It depends on their knowledge and power and how enterprise members accept them. When members need help and consultation, those who help will be accepted into leadership roles. A community enterprise head doesn't have to know everything. Say, for example, if he or she is good at marketing, the group can also survive."

He further added:

"Most community enterprise leaders are above 40 years of age. People in their 30s might not have enough creditability to get these positions. Most farmers are already quite old. So long as they are still healthy and have the capability to hold such position, it's fine to have them as enterprise leaders. … Older people often have their own networks."

This research substantiates the literature by presenting the dynamics of relationships, dominance and interdependency within community enterprises. Huaysai and Nayaw-NaUdom enterprises were community-led businesses and the leaders of both had the power to control soap production rates and could occasionally choose consumer markets on behalf of their

members. Both enterprises ran their businesses in a similar fashion, with members voting every 2-4 years to appoint leaders who would become community enterprise traders and the main sellers of the enterprise's products.

While members were mostly hired during production, they had the freedom to choose which activities they would participate in, and when they would participate. Despite the leaders' influence, members still attended regular meetings where they could have their ideas and opinions heard. This is consistent with the findings of the EU-Thailand Small Projects Facility's 2007 study, which notes that farmers take multiple roles in the silk value chain. In contrast, leaders of privately-owned businesses like Chumtabong and Poethong Charoen might not even need consent from their members when choosing what to produce or trade.

7.1.3 Government Support

This research argues that government intervention is essential for the success of community enterprises in the soap industry. The research shows that government assistance and guidance was needed because most farmers did not fully understand how to operate a soap business and were constrained by limited funds and transport issues.

This research also considers the extent to which sericulture community enterprises act as mediums that allow enterprise members to receive further support from the government in order to enhance their socioeconomic well-being. To receive free support, funding, tax free status, and training from various Thai government agencies, each of the enterprises studied were registered as SMCEs (MOAC, 2005). If their yearly revenue is less than 1.8 million baht, such enterprises operate on a tax-free basis (The Revenue Department, 2017). Likewise, enterprises can arrange flexible financing. Depending on the amounts borrowed and the return periods required, enterprises can expand their businesses by seeking credit and finance from public financial institutions at 'zero to low' rates of interest (Santoso *et al.*, 2005; Bird *et al.*, 2011; GSB, 2018).

Because communities have differing requirements, government agencies tailor their support to meet each enterprise's needs. However, most agencies offered the Huaysai, Chumtabong and Nayaw-NaUdom community

enterprises similar assistance as far as issues like knowledge and technology transfer, funding, production, marketing, and trade facilitation were concerned.

BEDO assisted Chumtabong enterprise (Neal 2014), while CT of Nakhon Ratchasima province supported Huaysai enterprise. Likewise, CT of Buriram province supported Nayaw-NaUdom Enterprise (Clinic Technology, 2012b, 2014). Both Huaysai and Chumtabong enterprises produced liquid soap and soap bars, while Nayaw-NaUdom enterprise only produced soap bars. Each group sold soap in addition to silk fabrics to diversify their portfolios and generate more income.

Yongyuth, a CT official, suggested:

"*Each community has different preferences. Some only want to produce silk fabrics because they are already in the market and have orders. Other communities only sell silk fabrics with a particular style and colour, but still manage to sustain their businesses. Silk textiles remain sericulture community enterprises' main products as they are used in the clothing industry."*

As they received free training from Thai government agencies (i.e. BEDO, CT, and TINT) all sericulture enterprises have received similar input and use similar soap production methods and procedures (MOAC, no date; Neal, 2014; MOST, 2015). There are therefore no trade secrets as far as soapmaking is concerned in Thailand unless they chose to adjust their production, ingredients or marketing to differentiate themselves from others.

The support the enterprises received has led to increased market activity and competition in Thailand's soap market. Such competition had the potential to create tension between enterprises, and to tackle this situation they differentiated their products using different natural additives (honey, mulberry leaves, gac, etc.) in addition to sericin. They also invested in their own packaging and branding and embarked on their own pricing strategies to reach their target markets (as depicted in Figs. 7.1, 7.2 and 7.3).



Figure 7.1 Soap and silk cocoons produced by Nayaw-NaUdom enterprise.



Figure 7.2 Soap bars and liquids produced by Chumtabong enterprise.



Figure 7.3 Soap, lotions, and silk handicrafts produced by Huaysai enterprise.

7.1.4 Operational Soapmaking Styles

Yellow native Thai or Thai-hybrid silks were already being produced before government agencies introduced soapmaking schemes to rural villages (Meesilpa *et al.*, 2004; TINT, 2010; MOST, 2013), and all of the enterprises involved in this study chose to extract sericin from these types of silk. As a result, this study maintains that the agencies' soapmaking schemes leverage available resources and existing skills. As agencies encouraged farmers to use existing resources, this enhanced the likelihood of local participation in soapmaking schemes.

Thai silk exhibits anti-oxidant, anti-tyrosinase, anti-allergy, and anti-inflammatory properties (Sarovart *et al.*, 2003; Park *et al.*, 2008; Yokohira *et al.*, 2008; Butkhup *et al.*, 2012) and this adds value to the sericin extracted from Thai silk. Agencies were able to encourage locals to recycle water used in the degumming process by pointing out the economic value of the sericin it contained. They were also able to highlight these features when marketing sericin soap.



Figure 7.4 Silk cosmetic production house at Chumtabong community.

This research fills the gap in the literature by presenting different operational soapmaking styles in rural communities in Thailand. These differing styles might be influenced by issues like organisational culture and human capital, but can also be shaped by the resources available to each enterprise (De Long and Fahey, 2000; Supyuenyong, Islam and Kulkarni, 2009; Felício, Couto and Caiado, 2012).

Chumtabong enterprise differentiated its approach to soap production from that of Huaysai and Nayaw-NaUdom enterprises by only allowing the family of their chairperson to produce soap bars and liquid soap at its 'cosmetic production house' (which was funded by BEDO) (Fig. 7.4). In contrast, to give all members the opportunity to independently generate income from soapmaking, Huaysai and Nayaw-NaUdom enterprises allowed members to produce soap anywhere in their communities. At the time of this study, lack of funding prevented the building of cosmetic production houses at these two enterprises.

This study argues that as its soap products are produced by a limited number of people and in a controlled environment, Chumtabong enterprise is more likely to maintain appropriate quality standards than the other two enterprises. Regardless of whether producers are instructed to follow the same procedures or not, lack of monitoring and quality control at Huaysai

and Nayaw-NaUdom enterprises may result in products of varying standards. Consumers who expect products of the same quality for the price they pay are likely to perceive this as being unfair.

This research substantiates the literature by presenting the differences between the delivery of liquid soap and soap bars. While the packaging of each type of product is obviously different, key production differences include the use of differing types of glycerine and the addition of different ingredients (honey, gac, aloe vera, turmeric, etc.). The time each type of soap takes to set also differs.

The research indicates that soap additives like preservatives and fragrances were normally bought in Bangkok or from local shops. Some soapmakers bought these items independently, while others ordered them as a group to lower capital costs. Encouraged by government agencies to create more value added from local resources and to save money, enterprise members often obtained natural ingredients (such as honey) from their own farms or nearby forests.

Making soap bars takes considerably more time and effort than making liquid soap. To make liquid soapmakers simply mix glycerine liquid with sericin and other additives (i.e. plant extracts, preservatives and fragrances) and bottle the result (Teschari *et al.*, no date). When making soap bars, it is necessary to melt glycerine bars and mix the glycerine with sericin extract and any other ingredients (ibid). The solution is then poured into moulds and it takes about an hour for the forms to set. Once finished, the soap is packaged. Typically, to showcase the origin of the products and achieve brand consistency and image, packaging is selected by the enterprise.

Leaders at Huaysai and Nayaw-NaUdom enterprises helped their groups by using enterprise funds to buy soap packaging in bulk from shops in their provinces. To lower operational costs and support members who could not buy materials independently (because of issues like time constraints and transport), leaders then delivered the packaging to members in their respective communities.

Enterprise owners at Chumtabong took an alternative approach, ordering packaging from manufacturers in Nakhon Sawan and Bangkok in large

quantities. These manufacturers then delivered packaging to members' houses, saving both time and money.

7.1.5 Obstacles Faced by Community Enterprise Members

This research fills the gap in the literature by highlighting the obstacles that can impede the success of community enterprises in the soap business. These include lack of manpower, poor marketing strategies, ineffective stock management, lack of government support, and transport issues.

Findings suggest that issues faced by members of Poethong Charoen enterprise meant they were not able to diversify silk products and ultimately not able to produce sericin soap. Poethong Charoen enterprise was the only enterprise in the case studies that did not receive assistance from any of the available government agencies. Members used their own resources to start their soapmaking business. In doing so they struggled with issues like human resources, funding, and marketing and selling products, issues intervention by government agencies could have helped alleviate.

Chatree, a leader and owner of Poethong Charoen sericulture enterprise, explained:

"We have lots of work to do here so we cannot run a soap business. I used to fund a project that let our housewife group produce soap, but each time I bought raw materials it cost me around 3,000-4,000 baht. Ultimately the housewife group stopped making soap."

He also expressed concern regarding market competition:

"If we diversify our silk products the price will increase [due to production costs] and they will be hard to sell. We might not be able to sell all our products and we might not break even. This happened to us once. That's why now we only sell mulberry leaves and silk cocoons. When customers call us to make an order, we can prepare things straight away. … When our silk cocoons are ready, we can call QSSC and ask them to let our customers know that we are ready to send them out. [The agency] transfers money to us and we just have to pack them up and send them out to customers. Sometimes, they even come to our centre to collect them."

In contrast to Poethong Charoen enterprise, community enterprises whose soap businesses were profitable and successful typically received support from government agencies.

Suchart, a 74-year-old male sericulturist from Chumtabong community who produced both silk and soap with other members, commented about how government support enhanced his economic well-being:

"In the past, when the Royal Thai government weren't supporting our sericulture activities, it was difficult for us to find appropriate markets where we could sell silk-related products. As a result, I wasn't motivated to do this type of business. Now, with government support, we have our markets and we can generate better incomes than we could from rice farming. We earn approximately 80,000 baht a month from our silk-related business. In comparison, we could only earn 6,000 baht a year tending a 3.2-hectare rice farm."

This research argues that the presence of community enterprise traders is highly beneficial to the efforts of enterprise workers. Findings show that as they did not have their own vehicles, and public transport in their areas was insufficient, soapmakers were unable to go to local markets and government fairs themselves to sell their products. As a result, they were more inclined to stay in their villages, concentrate on farming, and depend on middlemen.

Most Huaysai and Nayaw-NaUdom soapmakers relied on community enterprise traders to help them market their soap. As part of their support, enterprise traders dealt with private businesses and government agencies on behalf of enterprise members.

This research asserts that transport issues are major obstacles to community enterprises enjoying equal and equitable benefit from government support in areas like marketing and trading. Not all community enterprise traders have the funds or information they need for cost-effective travel to the government fairs that allow rural communities to sell products free of charge. Transport issues therefore enhance socioeconomic inequalities between rural communities. Table 7.1 shows the distance between the communities and one of the leading government fairs in Bangkok. The table also indicates

travel time by car. Issues like poor infrastructure and traffic congestion could mean that travel time might be much greater than shown.

Table 7.1 shows distances and minimum travel times by car from sericulture communities to Queen Sirikit National Convention Centre in Bangkok, which is the venue for one of the main government fairs that allows community enterprises to sell products for free.

Community	Distance (km)	Driving Time (hrs)
Huaysai	329	5:00
Poethong Charoen	710	9.30
Chumtabong	302	4:00
Nayaw-NaUdom	335	5:00

Travel concerns are likely to encourage community enterprise traders to only attend government fairs that are nearest to them. But the location and venue of each fair means it attracts a specific type of audience. While free of charge, the fair nearest to an enterprise trader might not attract the type of consumers that are willing to buy his or her soap products. As a result, simply attending the nearest fair might impact a trader's potential sales and profits. This research therefore suggests that the extent to which each enterprise benefits from this type of government assistance is bound by location and where community enterprise traders can go to sell their products. Consequently, this is likely to limit the geography of soap consumption to specific places and space and in turn affect profits both traders and producers can potentially generate.

This research supports Turner and Fouracre's (1995) study which suggests that because the majority of soapmakers and community enterprise traders are women who carry out multiple roles to support their enterprises and households, women are generally more affected by transport issues than men.

7.1.6 Profit-Sharing Schemes in Community Enterprises

This research contributes to the literature by indicating that different business models favoured by sericulture community enterprises are influenced by characteristics of enterprise workers and local culture. Profit sharing is one of the approaches the enterprises adopt as a business model.

This research argues that SMCEs create opportunities for community enterprise traders and producers to band together. This helps to reduce their operational costs, enhance their competitive advantages and maximise the use of their limited resources, leading to an increase of profits shared among chain actors and higher-value markets (Valentinov, 2007; Markelova and Meinzen-Dick, 2009; Fischer and Qaim, 2010).

While both Poethong Charoen and Chumtabong enterprises were privately-owned, they differ in terms of how their members benefit. The leader of Poethong Charoen enterprise hired members to assist in silkworm rearing and mulberry cultivation, paying them 200 baht a day. On the other hand, in addition to helping members sell their handmade silk textiles, the owner of Chumtabong enterprise hired members to process soap packaging and silk production, paying them 250 baht a day.

The structure of Chumtabong enterprise was such that the chairperson and vice chairperson of the enterprise both owned soap businesses and were the enterprise's main soapmakers. As the chairperson was the mother of the vice chairperson, profits generated by soap sales went to the chairperson's family.

While Huaysai and Nayaw-NaUdom enterprises are community-led businesses, there are also key differences in how they operate. Nayaw-NaUdom invests in raw materials for its members, while Huaysai producers normally have to invest in their own raw materials or borrow them from the enterprise. The members of both groups received soap orders from their leaders/community enterprise traders and, depending on the situation, they chose to produce soap either individually or in groups. Both individuals and groups were only paid when community enterprise traders had managed to sell all the products.

To follow enterprise standards, soapmakers in Huaysai and Nayaw-NaUdom communities sold their handmade soap in their own villages at the same price, while enterprise traders sold it at a premium price outside their communities. However, the enterprises differed in how they set their prices. Prices for Huaysai community enterprise traders were set by the enterprise itself, while traders at Nayaw-NaUdom had more freedom to determine prices themselves based on the markets they wished to enter. Profits were

then shared between the enterprises, traders and producers according to prior agreements.

Findings suggested that enterprise workers at Nayaw-NaUdom and Huaysai were quite satisfied with the community's profit-sharing system as it had originally been decided on amongst themselves. This research also indicates that profit sharing between soapmakers and community enterprise traders at Huaysai and Nayaw-NaUdom was 'trust-based', a situation that had the potential for exploitation if those in charge of the scheme are unscrupulous in any fashion.

This research makes it clear that the balance of power between community enterprise traders and producers is unbalanced, and to a certain degree, depends on circumstance. The research shows that constraints on community enterprise traders' ability to price Huaysai enterprise soap prevented them from maximising profits and might have led to the enterprise losing profits. Operational costs vary depending on the markets traders plan to enter and the transport methods they plan to use. As a result, this may discourage them from trading when trade volumes are low.

This research further argues that this quasi market, with rules set by the community enterprise, helps to enhance profit sharing transparency within Huaysai enterprise. This in turn helps to reduce conflict among members. However, despite the benefits, this approach might not maximise chain actors' profits or increase trade efficiency.

Nayaw-NaUdom community enterprise traders were free to price products themselves, and as a result could maximise profit in any suitable market. This gave them the incentive to find markets that would generate additional profit for themselves, their enterprise, and for soapmakers.

Table 7.2 Profit sharing scheme at Huaysai community enterprise (in Thai Baht) and as a percentage of selling prices

Type of soap (Capital cost)	Profit: Huaysai community enterprise	Profit: soapmakers	Profit: community enterprise traders	Profit: private traders	Profit: Clinic Technology (government agency) *
60g bar (THB16/bar)	1.05 (3%)	18.20 (52%)	15.00 to 25.00 (depending on the packaging) (30-42%)	45.00 to 115.00 (56-77%)	0.00 (0%)

240ml liquid (THB53/bottle)	3.00 (3%)	44.00 (44%)	20.00 (17%)	90.00 to150.00 (47-60%)	0.00 (0%)

NB. *Clinic Technology office used the same retail prices as other Huaysai community enterprise traders, and subsequently donated all profits to be shared between the community enterprise and its producers.

Table 7.3 Profit sharing scheme at Nayaw-NaUdom community enterprise (in Thai Baht) and as a percentage of selling prices

Type of soap (capital cost)	Profit: Nayaw-NaUdom community enterprise		Profit: community enterprise Fund	Profit: community enterprise traders	Profit: private traders (Lampraimart (LPM)	Profit: Clinic Technology (government agency) *
30g bar (THB13.5/bar)	From retail price (THB35) (Sold outside village)	≥18.00 (≥51%) (depending on sales' price set by community enterprise trader)	≥1.75 (5%)	≥1.75 (5%)	No trading	None (0%)
	From retail price (THB25) (Sold inside village)	9.00 (36%)	1.25 (5%)	1.25 (5%)	No trading	None (0%)
	From wholesale price (THB20)	4.50 (23%)	1.00 (5%)	1.00 (5%)	1.50 (43%)	None 0%
60g bar (THB27/bar)	From retail price (THB60) (Sold outside village)	≥27.00 (≥45%) (depending on sales' price set by community enterprise trader)	≥3.00 (5%)	≥3.00 (5%)	No trading	None (0%)
	From retail price (THB50) (Sold inside village)	18.00 (36%)	2.50 (5%)	2.50 (5%)	No trading	None (0%)
	From wholesale price (THB45)	13.50 (30%)	2.25 (5%)	2.25 (5%)	15.00-25.00 (25-36%)	None (0%)
100g bar (THB45/bar)	From retail price (THB110) (Sold outside village)	≥54.00 (≥49%) (depending on sales' price set by community enterprise traders)	≥5.50 (5%)	≥5.50 (5%)	No trading	None (0%)
	From retail price (THB100) (Sold inside village)	45.00 (45%)	5.00 (5%)	5.00 (5%)	No trading	None (0%)
	From wholesale price (THB80)	31.00 (39%)	4.00 (5%)	4.00 (5%)	40.00 (33%)	None (0%)

NB. *As in the Huaysai case, the Clinic Technology office donated all profits to Nayaw-NaUdom enterprise. The difference was that before distributing money between producers the profits were first divided between traders, the community enterprise, and the enterprise fund.

Tables 7.2 and 7.3 demonstrate that both Huaysai and Nayaw-NaUdom community enterprises have transparent profit-sharing schemes that allow soapmakers to realise profits from producing and selling soap via their enterprises. To prevent potential conflict or exploitation, these schemes were based on agreements amongst members.

This research also reveals that standard profit-sharing arrangements set by both Huaysai and Nayaw-NaUdom enterprises helped to ensure that every soapmaker and trader got fixed profit margins for every soap product sold. This helped to make things fairer and avoid conflict and ambiguity within the groups and with other actors.

This research fills the gap in Dunaway's 2014 study by demonstrating that a combination of assistance from community enterprise traders, intervention by government agencies, and transparent profit-sharing schemes set by community enterprises help an overwhelmingly female workforce of soapmakers avoid exploitation and receive a fair share of soapmaking profits.

As shown in Table 7.2, Huaysai community enterprise traders pay individual soapmakers in cash on a monthly basis. A 3% tariff is deducted from producers' incomes and this amount is shared with the enterprise. Huaysai soapmakers had higher profit margins on sales of products than community enterprise traders and government agencies, but lower margins than private traders. This contrasts with the findings of the EU-Thailand Small Projects Facility (2007) which suggest that with limited negotiation power and reliance on middlemen, silk producers often earn the least profit in the silk value chain. This study argues that soapmakers cooperate in a fashion that strengthens their negotiating position and helps them avoid conflict and unfair treatment within their enterprises. As a result, reliance on community enterprise traders does not result in unfairly low profits for upstream actors.

Nayaw-NaUdom community enterprise traders split the profit from soap sales into three unequal parts: 5% of the selling price for themselves; 5% of the selling price for the enterprise fund; and the balance of the profit given to the enterprise for the purchase of raw materials for the next batch of soap (cf. Table 7.3). Individual soapmakers were not paid directly as they only

contributed their labour and did not have to invest in raw materials and equipment themselves.

The accumulated enterprise fund is shared among producers in the form of yearly dividends, and what each member receives depends on several factors. These include the number of hours and the amount of work a producer has contributed to the group, the number of stocks each owns, and annual sales.

Chumtabong soapmakers mainly sold soap to BEDO and private traders. As they rely less on middle men, the research asserts that they are less open to exploitation. As community-owned businesses, Huaysai and Nayaw-NaUdom are more dependent on community enterprise traders, and more open to exploitation.

Chumtabong enterprise's profit-sharing scheme is presented in Table 7.4. As they had invested in the enterprise and overseen sales, the leader's family was the sole recipient of soap trading profit. Some of this profit was used to manage enterprise activities like training, and as a result, other members benefitted from the enterprise's success.

Table 7.4 Profit generated by Chumtabong community enterprise, BEDO and private traders (in Thai Baht) and as a percentage of selling prices

Type of soap (Capital cost)	Profit: Chumtabong community enterprise		Profit: BEDO (government agency)	Profit: private traders
50g bar (THB24/bar)	From retail price (THB55)	31.00 (56%)	No trading	31.50 (46%)
	From wholesale price (1 dozen = THB450)	13.50 (36%)		
80g soap bar (THB34/bar)	From retail price (THB100)	66.00 (66%)	37.50 (38%)	57.50 (48%)
	From wholesale price (1 dozen = THB750)	28.50 (46%)		
120ml liquid (THB55/bottle)	From retail price (THB120)	65.00 (54%)	36.70 (31%)	Unknown
	From wholesale price (1 dozen = THB1,000)	28.30 (34%)		
240ml liquid (THB55/bottle)	From retail price (THB129)	76.00 (59%)	45.70 (35%)	Unknown
	From wholesale price (1 dozen = THB1,000)	30.30 (36%)		

This research also substantiates the literature by presenting the strategies sericulture community enterprises adopt to manage soapmaking costs and profits within their enterprises. It also indicates how these strategies influence socioeconomic impact on enterprise workers.

Several factors impacted the soap production costs and profit structures of individual soapmakers at Huaysai enterprise. These included which ingredients they required, how they obtained raw materials, and the cost of transport. In addition, the types of additives required for soap production and labour and packaging costs also influenced cost and profit. Despite having different operational costs, Huaysai soapmakers had to retail their soap products at a price agreed by the enterprise.

By contrast, as their enterprise funded production, soapmakers at Nayaw-NaUdom enterprise were more cushioned from the impact of fluctuating costs. Unlike Huaysai soapmakers, their incomes were based on annual dividends, and not profit margins.

In a third model, Chumtabong soap owners managed all soap production costs themselves and tried to maximise profits by ordering raw materials in substantial quantities to lower capital costs. Their profits therefore depended on market conditions.

7.1.7 Contribution to Communities

This research argues that with a diverse range of operational management approaches, profit sharing schemes and business activities, community enterprises have differing levels of impact on their workers, the communities they live in, and the environment.

This research suggests that through their entrepreneurial activities sericulture community enterprises assume a role of 'community developer'. They contributed to community development by investing profit in community projects and generally enhancing the capacity of enterprise members.

Each of the enterprises in the study used funds to buy raw materials and equipment for silk and soap production and silk weaving. Members could

utilise these items either free of charge or at low cost. Enterprise funds were also used to provide enterprise members with training.

Huaysai also used funds for funeral expenses when members died, and BEDO required Chumtabong to allocate funds to forest restoration projects as a condition for its commercial assistance and knowledge transfer. Chumtabong's profits were also used to support an education fund for students in their community (although it was not immediately obvious how they did this).

This research shows that enterprise profits enable members to expand their individual businesses and support their families. Except for Poethong Charoen, community enterprises allowed members to take a loan without requiring collateral. Huaysai enterprise allowed members to borrow up to 5,000 baht a time at only 1% interest per month. Similarly, Nayaw-NaUdom enterprise allowed members to borrow up to 30,000 baht at the same interest rate. Members of Chumtabong enterprise could borrow money at zero interest. Their debt would be deducted when their handmade products were sold through the enterprise's distribution channels.

This research argues that communities where sericulture community enterprises are based benefit from their success. This spin-off is appreciated by locals who are not part of the enterprise communities. Interviews show that enterprises engaged in selling OTOP products and related activities helped to promote the villages where they were based. These villages were then more likely to receive government support, and this support helped to improve the local economy.

Kaow, a 53-year-old male Huaysai farmer, commented:

"I believe that sericulture benefits our community as the government has provided funding for us to development our communal areas. Our community has a good reputation for sericulture, and now tourists and other visitors come to buy food and goods at my store."

Similarly, Suthep, a 45-year-old male Chumtabong community leader, suggested:

"Sericulture activities and silk-related products give Chumtabong Village a good reputation. If we say that we come from [this] village, it is a guarantee that our community is strong and has good OTOP products. This impacts the rest of the community as we now have more support from the government."

7.2 Following Soap Production

This section consists of three sub-sections covering 1) Socio-Economic Backgrounds of Enterprise Members, 2) The Tale of Soap Production and 3) Outputs of Soap Production.

7.2.1 Socio-Economic Backgrounds of Enterprise Members

The socio-economic characteristics of enterprise members/farmers engaged in soap production were evaluated based on the results of a questionnaire. As presented in Figures 7.5-7.13 (see Appendix 4 for raw data), the information provided by the questionnaire covered areas such as gender, age, marital status, yearly income from farming, yearly income from secondary positions, and total income. The information also offered details of participants' farming experience, when they worked in secondary positions, and their highest levels of education. In total, 64 questionnaires were collected before or after conducting face-to-face interviews with the respondents. Not all of those interviewed made soap.

This research indicates that most enterprise members involved in soap production were female. Figure 7.5 indicates that female farmers made up 81.5%, 57.1%, 83.3%, and 72.2% of the interviewees at Huaysai, Poethong Charoen, Chumtabong, and Nayaw-NaUdom communities, respectively. This is broadly consistent with Haggblade and Ritchie (1992), Earth *et al.* (2008), and Siewsamdangdet et al. (2010) who point out that sericulture and silk weaving are traditionally defined as women's activities and soap making is regarded as an extension of silk production.

Figure 7.6 shows the average ages (in years) of farmers from Huaysai, Poethong Charoen, Chumtabong, and Nayaw-NaUdom communities were 58±13, 61±10, 49±14, and 53±9 respectively. Each community shows a high dispersion from the mean, reflecting considerable diversity within the enterprises. The average age of farmers in all communities was 55±12 years.

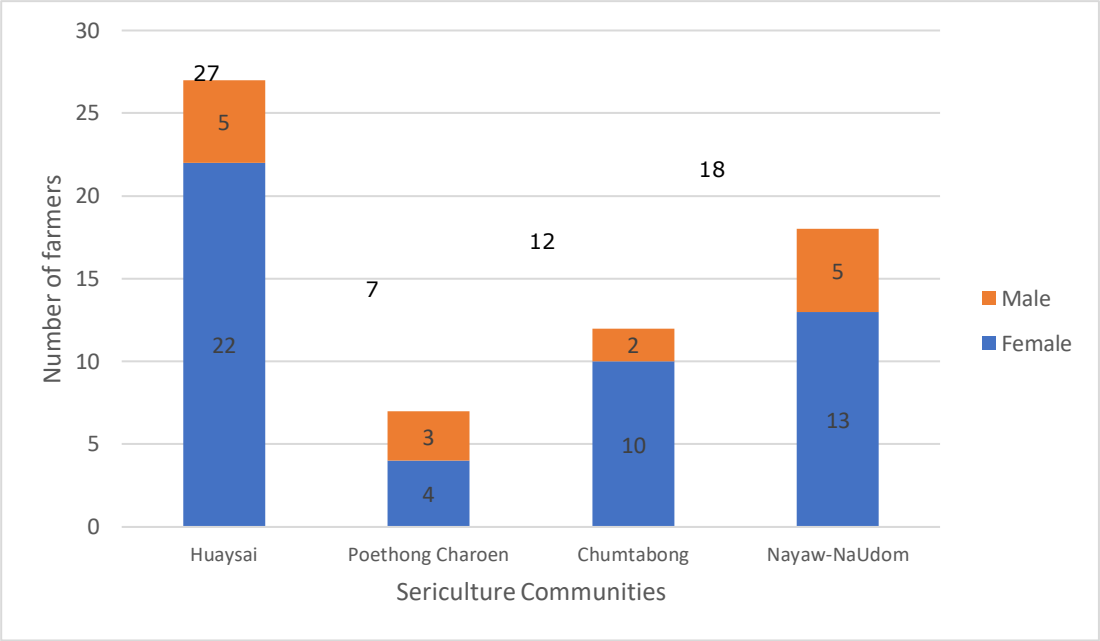


Figure 7.5 Farmer gender of selected case studies.

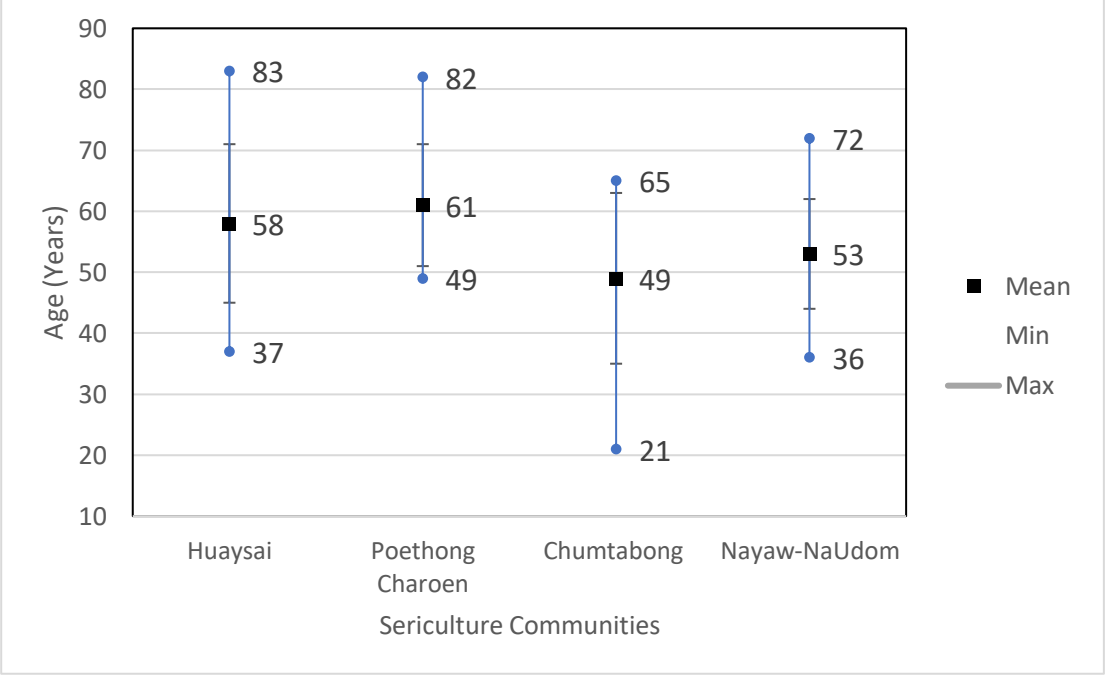


Figure 7.6 Average age of Thai farmers in selected case studies.

Figure 7.7 shows the that the average yearly incomes of farmers in Huaysai, Poethong Charoen, Chumtabong, and Nayaw-NaUdom communities were 264,050±282,043 baht, 129,000±154,900 baht, 154,150±137,160 baht and 246,550±574,750 baht, respectively. The average yearly income of all communities from farming was 228,413±367,624 baht.

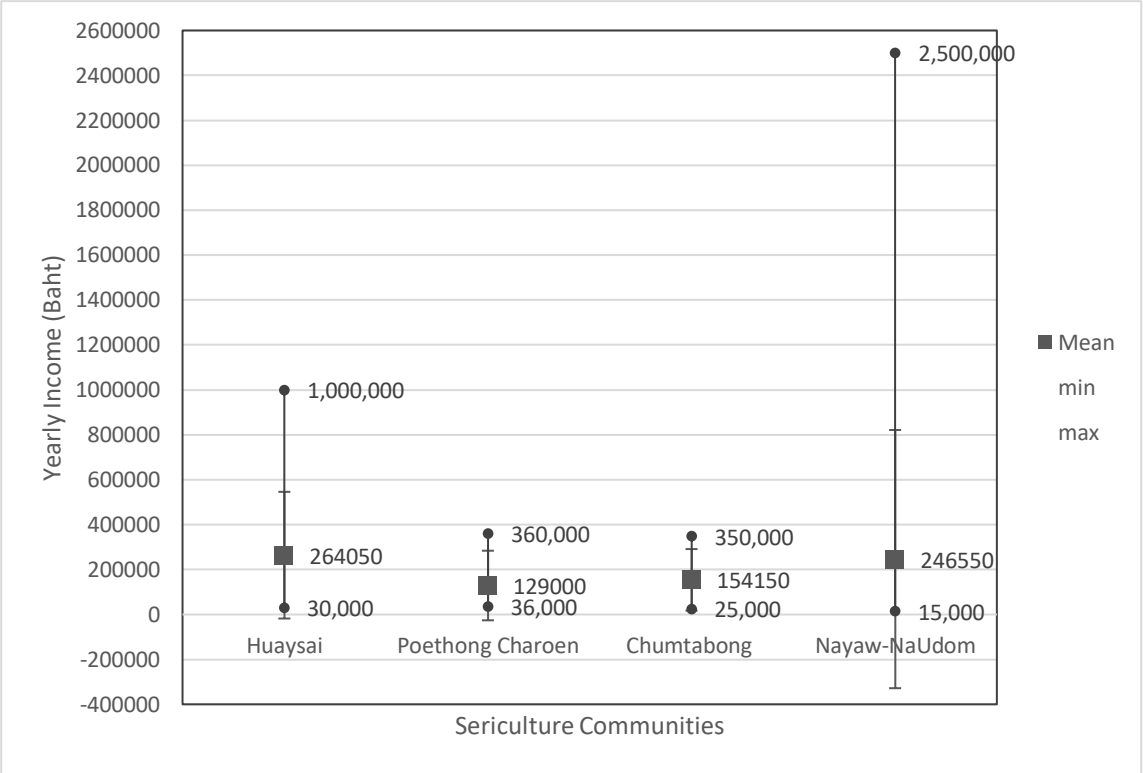


Figure 7.7 Yearly income of farming at Thai sericulture communities.

Figure 7.8 indicates the average yearly incomes enterprise workers received from secondary jobs (such as silk weaving and soap making) at Huaysai, Poethong Charoen, Chumtabong and Nayaw-NaUdom communities were 57,850±83,020 baht, 20,950±38,407 baht, 73,335±183,195 baht and 94,450±77,050 baht, respectively. The average yearly income of all communities from secondary jobs was 73,934±101,708 baht.

As expected, because they relied more on income from agriculture (or making compost) and relied less on income from the sale of silk-related products, members of Poethong Charoen enterprise had the lowest incomes from secondary positions.

Figure 7.9 shows total incomes of farmers from farming and secondary jobs at Huaysai, Poethong Charoen, Chumtabong and Nayaw-NaUdom communities. These incomes were 321,900±276,613 baht, 149,950±174,945 baht, 227,485±246,867 baht and 341,000±614,701 baht per year, respectively. The average total income of all communities was 284,714±391,249 baht per year.

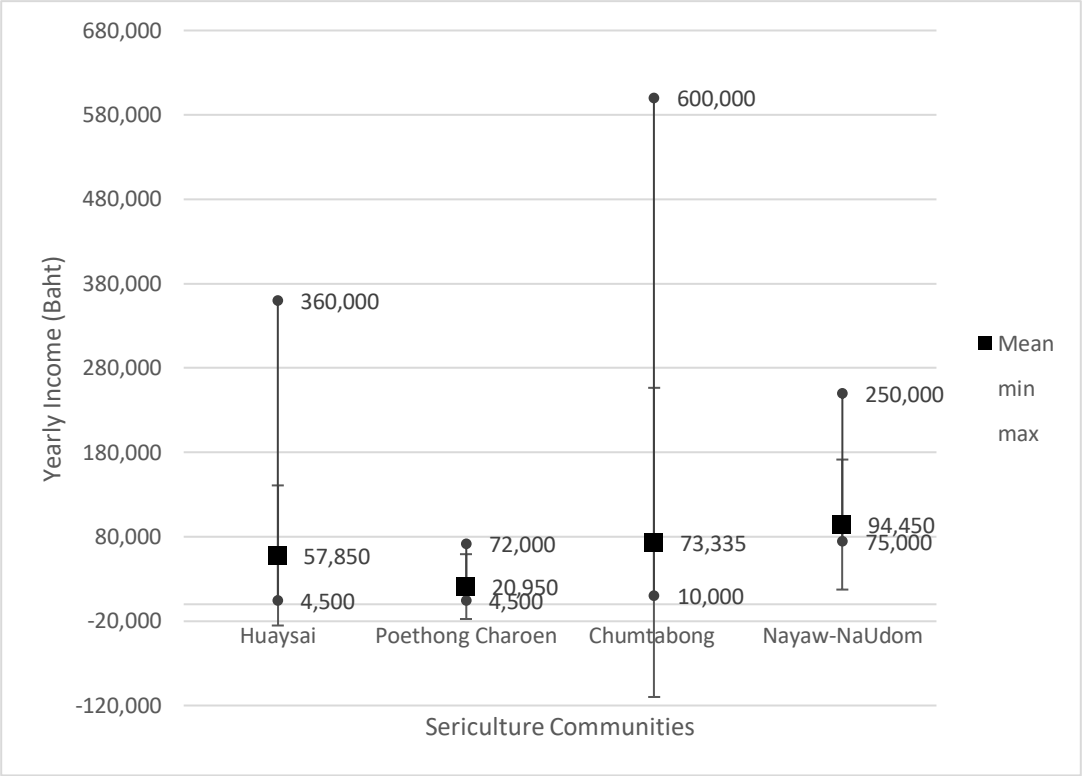


Figure 7.8 Yearly income of secondary jobs at Thai sericulture communities.

The wide dispersion of incomes from main and secondary jobs in each community reflects the fact that each group consists of people with differing abilities to generate income from more than one source. This reflects the different social statuses, characteristics and identities of the participants in this study.

This study demonstrates that most farmers generated higher incomes from farming than from secondary jobs. This is expected as, to get the highest levels of productivity possible from their farms, the majority of farmers grew crops that could be harvested once or twice a year.

Only a few farmers, predominantly community enterprise traders, generated greater incomes from silk and soap production than farming. Despite this, they still regarded farming to be their main jobs. As they are limited to generating income from handmade silk-related products and sericin-based cosmetics (which take various periods of time to produce), what community enterprise traders earn is restricted by workers' production rates. Aside from this, profit distribution between the various strands of their enterprises impacts their incomes, as do issues like consumer demand.

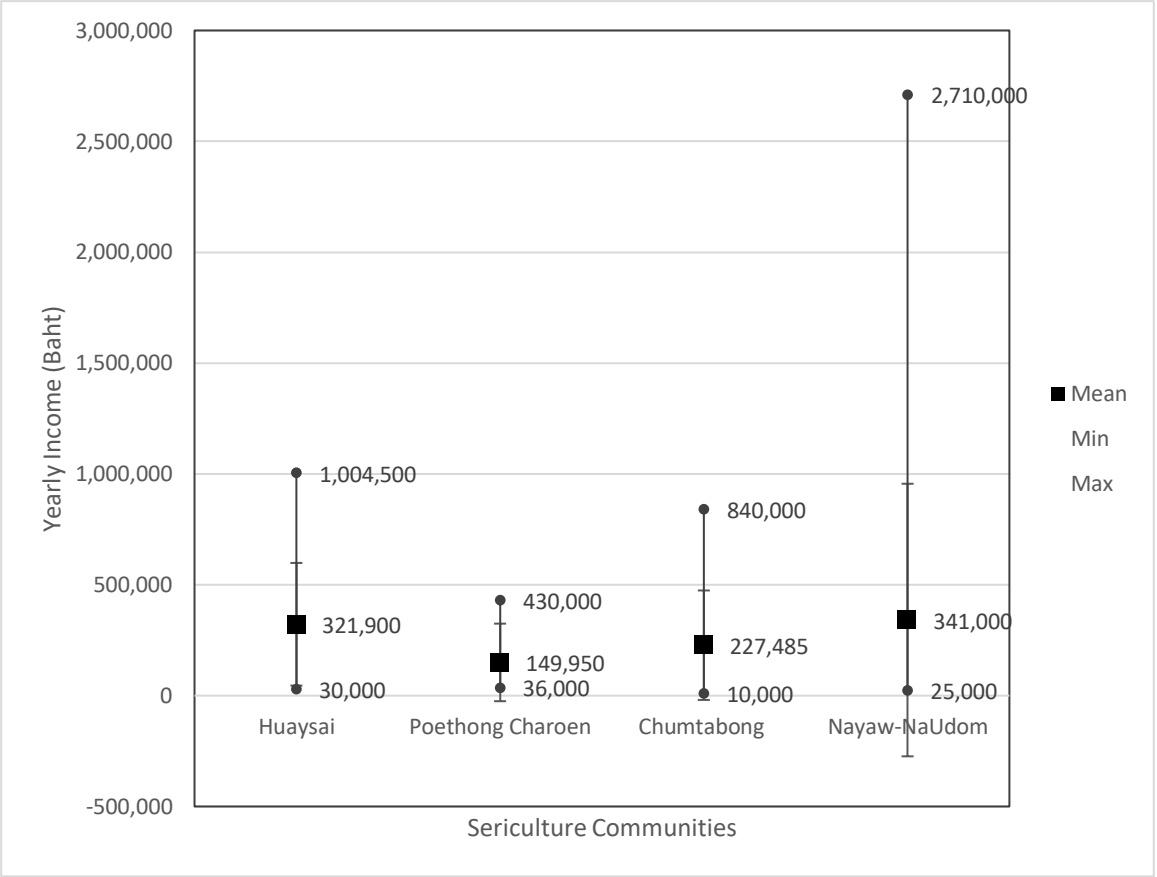


Figure 7.9 Total yearly incomes of farmers.

This research shows that farmers involved in soap production have considerably more farming experience than experience in silk-related activities. Figure 7.10 shows the number of years of farming experience amongst farmers at Huaysai, Poethong Charoen, Chumtabong and Nayaw-NaUdom communities. These were 40±13, 21±18, 34±19, 38±13, respectively. The average number of years in farming at all communities was 37±15.

Figure 7.11 shows the average number of years of working in secondary jobs amongst farmers at Huaysai, Poethong Charoen, Chumtabong, and Nayaw-NaUdom communities. These were 27±16, 5±1, 14±14, and 14±10 respectively. The average number of years worked in secondary positions for all communities was 20±15.

Figure 7.12 shows that most enterprise workers had only a primary level of education. However, education levels typically have no bearing on income in traditional agriculture. Issues like crop productivity and market rates for

produce have a much greater bearing on what farmers earn. Likewise, education levels are unlikely to affect what enterprise workers earn in secondary positions, as secondary positions also depend on issues like product quality and trade volume.

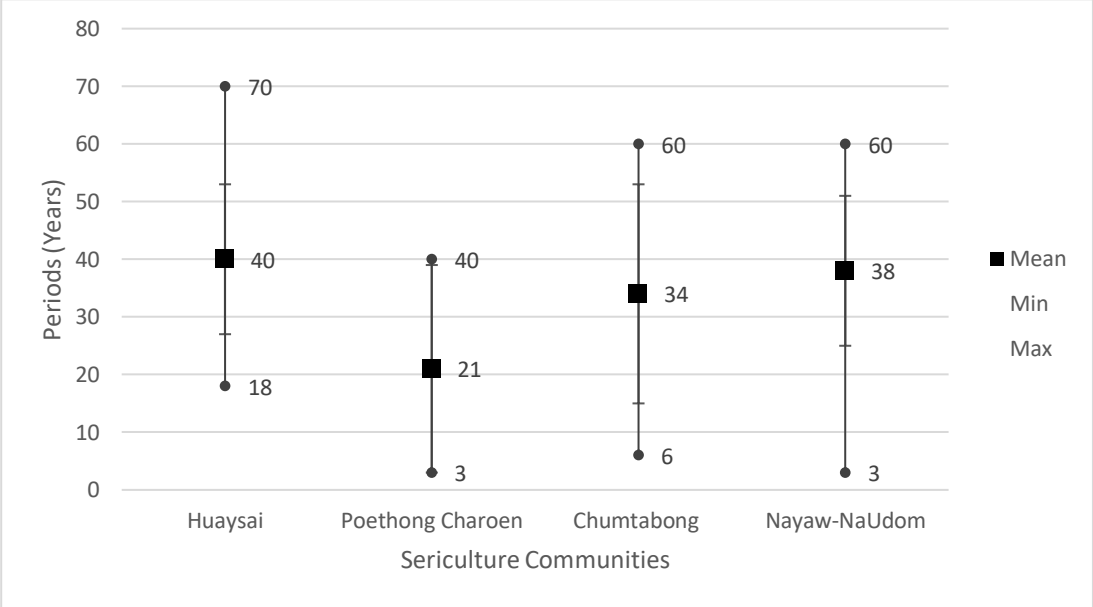


Figure 7.10 Farming experiences of farmers in sericulture communities.

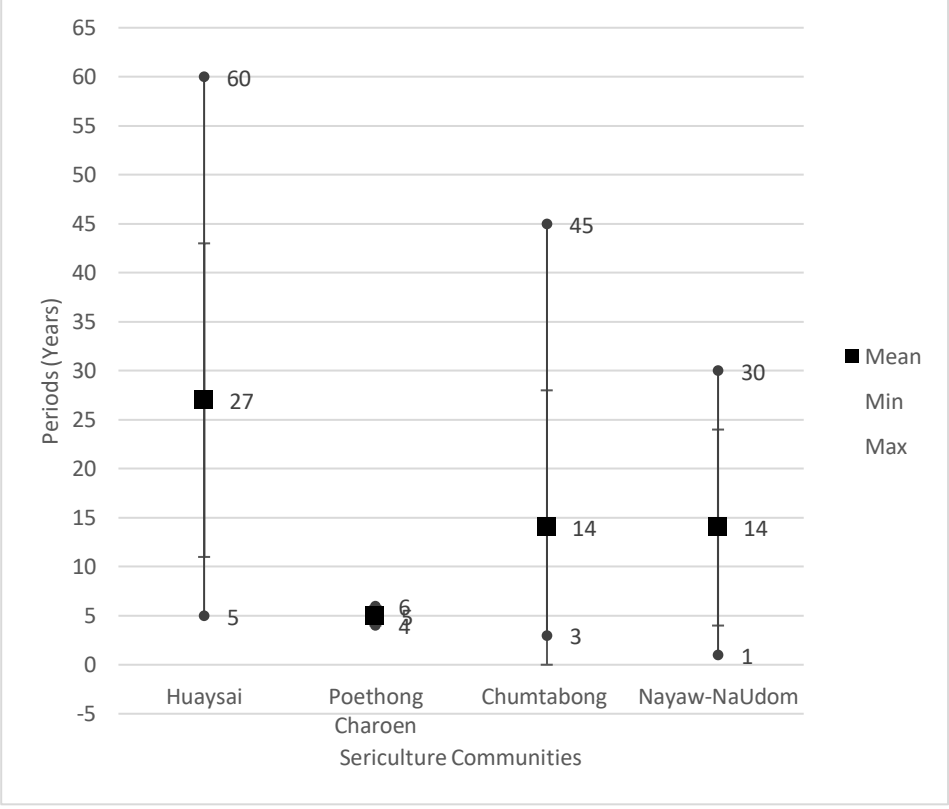


Figure 7.11 Working periods of farmers' secondary jobs.

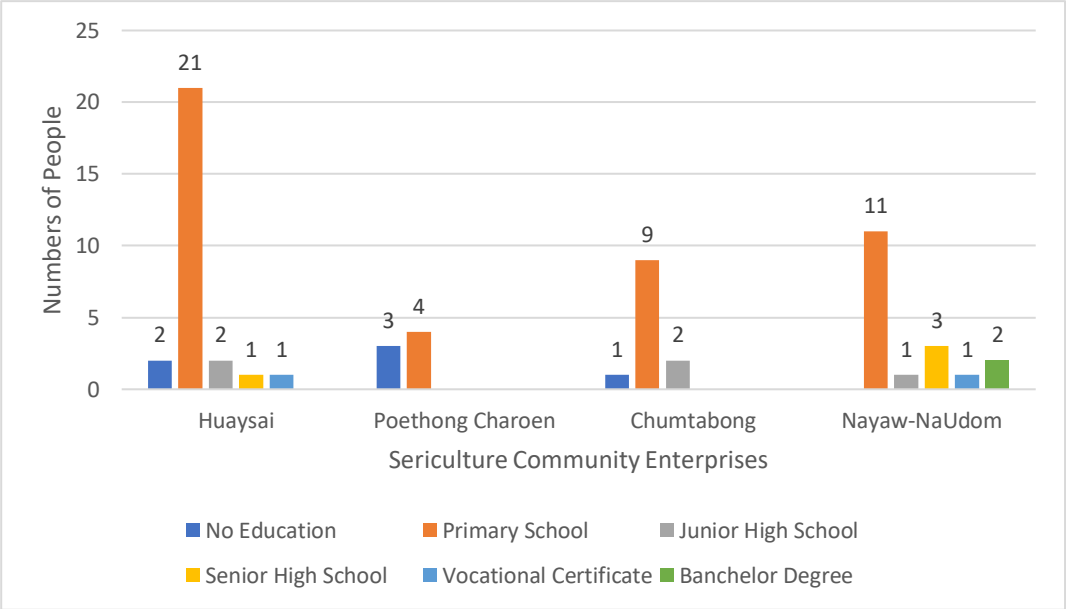


Figure 7.12 Highest education backgrounds of farmers of selected case studies.

Figure 7.13 establishes that more than 85% of farmers interviewed in each community were married. This corresponds to the fact that family labour plays a key role in farming, sericulture, and soapmaking.

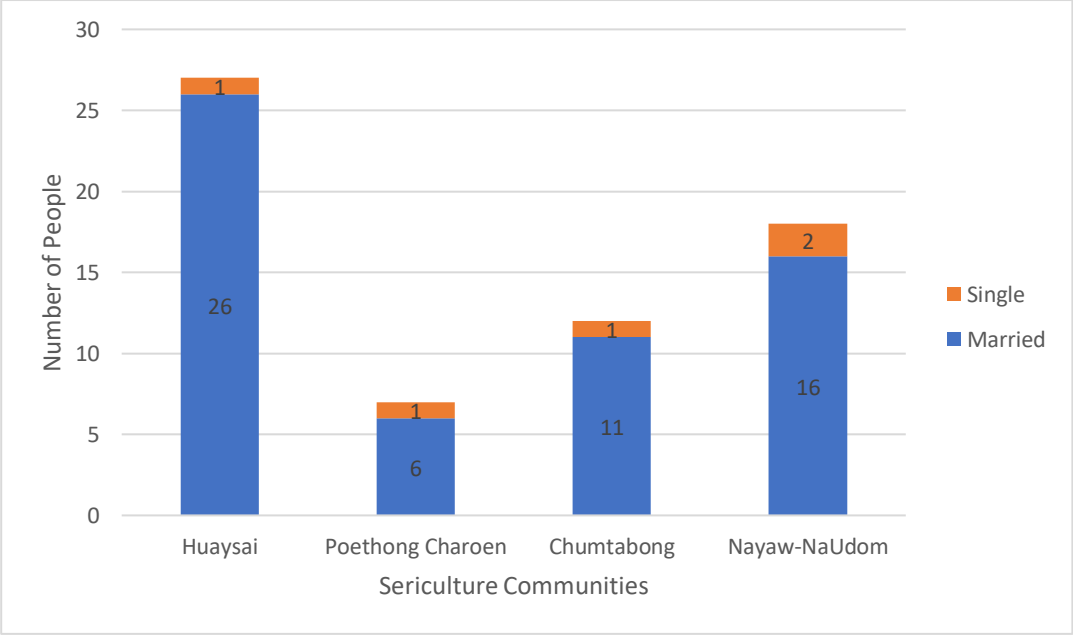


Figure 7.13 The marital status of farmers of selected case studies.

7.2.2 The Tale of Soap Production

Regardless of gender, most farmers originating from Thailand's Northeast came from families involved in agriculture and sericulture, were brought up working on farms, and were involved in sericulture from an early age (Haggblade and Ritchie, 1992; NESDB and the World Bank, 2005; Earth *et al.*, 2008; Siewsamdangdet, Vemuri and Bretherton, 2010).

Based on Figures 7.5-7.6, this research shows results consistent with current literature and suggests that most people engaged in silk production are middle-aged to elderly women (Charsombut and Islam, 1992; Ohno and Jirapatpimol, 1998; Agrifood Consulting International, 2005; Earth *et al.*, 2008). They are involved in this work because it is less physically demanding than farming and it is part of their cultural traditions. For others it represents a hobby.

Pranom, a 64-year-old female secretary of Nayaw-NaUdom enterprise, said:

"[Isan people] have been living with silk since they were young because their parents and grandparents produce it and teach them how to make it. My mother taught me how to make silk when I was young. But I didn't do it back then because I was scared. I preferred to farm and raise cattle. I began to weave silk when I turned 60 years old. Even though I wasn't as good as others, I could still do it. … Silk is in the identity of Isan people. For instance, when making merit at the temple, some people offer silk robes to the monks."

Aphiwan, a 68-year-old male sericulturist at Huaysai community, commented:

"Elderly people like rearing silkworms at home because even when they find it difficult to walk, they can still drag around a bag of mulberry leaves to feed silkworms. I was previously involved in farming, but now that I am old, I stay at home and rear silkworms."

This research shows that the length of time an enterprise worker has been involved in farming influences how likely he or she is to consider soapmaking a primary occupation. Figures 7.10 and 7.11 show that enterprise workers

generally spent much longer periods of time involved in farming than in their silk- and/or soap-related secondary jobs.

This research also contributes to the literature by demonstrating that unpredictable markets and relatively low incomes deterred enterprise workers from choosing soapmaking as a primary career. Enterprise workers considered soapmaking a relatively new business that suffered from a level of risk. In addition, to match the revenue generated from a single high-volume crop sale, soapmakers had to sell soap throughout the year. By contrast, farmers felt more confident when dealing with local factories. They had traded their crops with the factories for many years and knew they could sell their crops to them when they needed to. These factories either processed these crops before retailing or sold the produce directly to other big manufacturers in other provinces.

This study demonstrates that women are more likely than men to participate in the entire soap production process. Men might assist women in more labour-driven tasks like preparing mulberry farms, assisting in picking up mulberry leaves, and making tools for use in silk production (Siewsamdangdet, Vemuri and Bretherton, 2010). However, they generally left more delicate tasks like silk reeling, silk degumming, silk weaving and soapmaking to women. Traditionally such tasks are thought to be better suited to females. But with limited budgets and workforce, female soapmakers use family labour at a variety of points in the production process.

It is worthy of note that while soap production is often a collective activity involving several people, individuals can control the entire process from start to finish. This is consistent with Haggblade & Ritchie (1992) who suggest that traditional and Thai-hybrid silk producers generally perform all aspects of production themselves. Only a few producers (typically with large farms and high productivity requirements) hired workers.

Saimai, a 44-year-old female sericulturist from Huaysai community, elaborated on how she spent time with her partner:

"When we come back from farming in the evening, my husband and I pick mulberry leaves together near our farms. Because we are family, we help

each other as much as we can. There is no clear distinction between the tasks and who does what. We just help each other."

This research argues that because individuals with diverse socioeconomic and cultural backgrounds are often involved in the entire soap production process, it has distinct sociocultural characteristics. Soapmakers' approaches to soap production as an occupation reflects this. Regardless of whether soapmaking could offer them income with less effort, traditions, values, and culture drive soapmakers to maintain farming and sericultural lifestyles (Haggblade and Ritchie, 1992; Jitsanguan, 2001).

Because soapmaking was not their primary occupation, it was mostly carried out during times they were free from silk production or farming responsibilities. This research asserts that this level of flexibility is beneficial as it supports producers' agricultural and sericultural traditions while diversifying their business portfolios. Soapmaking integrates well with producers' lifestyles as it can be done anytime, anywhere, and with little investment or preparation.

Naree provided information about the investment costs needed for her mulberry farm:

"I pay 400 baht to hire a worker to plough my farm twice a year. I buy compost fertilisers at a cost of 500 baht and pay QSDS 1,000 baht for 1,000 mulberry cuttings. I then pay two workers 500 baht to plant these cuttings for me. The maximum capital cost needed to cultivate a 0.16 Ha mulberry farm is only 2,400 baht in the first year, or 15,000 baht per hectare. However, mulberry farmers normally pay less than this because their families provide the manpower needed to complete the work. After the first year of investment, farmers rarely pay for farm maintenance because these plants adapt well to the environment in Thailand."

Subsequently, Sudjai, a 76-year-old female Huaysai sericin soapmaker, commented on soapmaking:

"It's so easy to produce sericin soap. I can produce it by myself. When I started, I received training on how to produce soap, and I also asked my daughter-in-law to undergo the same training. Because my granddaughter also produces soap, she knows where we can get glycerine, and she buys it

for me and sends it here. It doesn't take much time to produce and I can produce about 100-200 soap bars per day."

Most farmers started their day around 3 a.m. to 4 a.m., working on their crop farms from 4.30 a.m. to 12.00 p.m. To avoid the heat of the day they only worked from 3.00 p.m. to 5.30 p.m. To allow them to get up early the next day they went to bed between 8.00 p.m. and 9.00 p.m. in the evening. During silkworm rearing periods (and depending on the stage of silkworm production) producers would generally feed silkworms fresh mulberry leaves three times a day (4.00 a.m. to 4.30 a.m., 11 a.m. to noon, and 4.30 p.m. to 5.30 p.m.) for 15-20 days (Haggblade and Ritchie, 1992; Zhisten, Mengcheng and Jianming, 1999; Babu, 2012; Astudillo, Thalwitz and Vollrath, 2015). As soapmaking was carried out when producers were free of farming and silk production duties, the soap production schedule was varied.

As environmental factors directly influence silk quality, the quality of sericin is dependent on how well farmers produce their silk (Lee, 1999). As a result, soap may contain varying amounts of sericin. This makes standardising soap products under a brand difficult to achieve due to the influence of the environment. Silk is synthesised from amino acids derived from the proteins in mulberry leaves (Bahar *et al.*, 2011). Silk quality depends heavily on the amount and quality of mulberry leaves silkworms consume (Abdullaev and Guseinova, 1961; Hassanein and Shaawary, 1962; Krishnaswami, Noamani and Asan, 1970; Krishnaswami *et al.*, 1971, 1973; Quader and Bari, 1989; Bahar *et al.*, 2011). The quality of mulberry leaves is dependent on a range of factors including climate, exposure to sunlight, soil quality, and irrigation (Bergmann, 1940; Legay, 1958; Hassanein and Shaawary, 1962; Narayana, Kasiviswanathan and Iyengar, 1967; Mustafaev, 1968; Das and Sikdar, 1970; Kasiviswanathan, Iyengar and Krishnaswami, 1970; Krishnaswami *et al.*, 1973; Babu, 2013).

This research argues that as most producers only make soap using sericin extracts from their own silk, the availability of silk impacts both soap production rates and soap business capital costs. As previously mentioned in Section 6.1, community enterprise leaders would normally order silkworm eggs and mulberry saplings from QSSCs on a monthly basis on behalf of their members. Members would then collect these items from leaders' houses at their own convenience. On average, farmers ordered around 1-3

silkworm egg sheets (both native and Thai-hybrid silkworms) each time they made an order.

Table 7.5 provides a study of the silkworm varieties used by SMCEs. Regular silkworm breeders reared up to nine batches of silkworms per year. The number of silkworm eggs requested depended on the size and condition of the mulberry farms, the sizes of the silkworm rearing houses (including the number of silkworm-rearing beds), and local climate conditions.

Table 7.5 Silkworm varieties used by the SMCEs being studied.

Silkworm breed	Sericulture Communities			
	Huaysai	Poethong Charoen	Chumtabong	Nayaw-NaUdom
Nangnoi	/	/	/	/
Nangsew	/			
Nanglai		/	/	/
Nangtui	/	/	/	/
Huaysai1 (Surin*Burirum)	/			
Luangpiroj	/	/	/	
Dokbua	/			
Chul 1			/	/
Chul 6			/	/
Kalasin	/			
Luang Surin		/		
Saraburi			/	
Luang Arun			/	

Sericulturists considered several factors before deciding which variety of mulberry to grow. These included soil and weather conditions in their areas, the size of the mulberry leaves, the number of mulberry leaves that could be produced, and how well a variety would withstand the pathogens and insects native to their areas. Table 7.6 shows which mulberry varieties were used by the SMCEs in this study.

Table 7.6 Mulberry varieties planted in selected case studies.

Mulberry type	Sericulture Communities			
	Huaysai	Poethong Charoen	Chumtabong	Nayaw-NaUdom
Buriram 60	/	/	/	/
Sakonnakorn 72	/	/	/	
Nakhon Ratchasima 60	/			
Khunpai	/			
Buriram 4				/
Buriram 6				/

Naree, a 50-year-old female leader of Huaysai enterprise who produced both silk and soap, explained how she chose mulberry varieties to grow on her farms:

"I check the soil conditions on my farms and see which mulberry varieties can withstand drought while producing a high number of leaves. For instance, the 'Sakon Nakhorn 72', 'Buriram 60' and 'Nakhon Ratchasima 60' varieties produce big leaves. It does not really matter which variety of mulberry leaves silkworms eat, they will always produce silk fibres. But we know that 'Sakon Nakhon 72' withstands drought well, while the local 'Nakhon Ratchasima 60' variety has a lot of root rot problems because it doesn't withstand drought well."

She further elaborated on why she grew many mulberry varieties:

"*It depends on the soil conditions on my farms. The Buriram 60 and Nakhon Ratchasima 60 varieties can be grown in clay. If we grow them in clay, they last a long time and generate a high number of mulberry leaves. On the other hand, if an area has sandy soil, I will go for the Sakon Nakhon 72 variety."*

Depending on circumstances, some soapmakers would not produce their own silk but would extract sericin from silk yarns they had borrowed from other enterprise workers. As the degummed silk yarns could still be dyed and weaved, they would be returned and made into silk. This research suggests that sharing sericin resources in this fashion offers several benefits. It is beneficial for silk weavers, who save time because they do not have to degum silk yarn themselves, and it helps soapmakers generate more income. As silk weavers might normally dispose of wastewater inappropriately during the silk degumming process, it also helps reduce pollution.

The sericulturists in each of the villages included in this study had a deep understanding of how silkworms should be reared, and this understanding was garnered from training provided by QSDS. This research presents that to maintain silkworms' economic value, sericulturists tried to save them from dying or being deformed (Etebari *et al.*, 2007; Park *et al.*, 2007; Zhang *et al.*, 2008; Bora, Khanikor and Gogoi, 2012; Munhoz *et al.*, 2013). To do this,

they avoid the use of artificial chemicals both in mulberry farming and in the silkworm rearing process. The additives used at different stages of soap production are shown in Table 7.7 (Etebari *et al.*, 2007; Park *et al.*, 2007).

Table 7.7 Summary of additives used in soap production

Steps of soap production	Type of chemical additives used	Communities			
		Huaysai	Poethong Charoen	Chumtabong	Nayaw-NaUdom
Mulberry cultivation	Herbicide	Paraquat Dichloride	None	Glyphosate	Paraquat Dichloride, Glyphosate
	Insecticide	Fermented Neem solution, wood vinegar	Fermented Neem solution, wood vinegar	Fermented Neem solution, wood vinegar	Fermented Neem solution, wood vinegar
	Fertiliser	Manure, compost, artificial fertilisers	Compost	Manure, compost, artificial fertilisers	Manure, compost, artificial fertilisers
Silkworm Rearing	Disinfectant	Paraformaldehyde 3%	Paraformaldehyde 3%	Paraformaldehyde 3%	Paraformaldehyde 3%
	Absorbent	Slaked lime	Slaked lime	Slaked lime	Slaked lime
Silk Reeling	Solvent	70-90 °C water	No activity	70-90 °C water	70-90 °C water
Silk Degumming	Solvent	Steamed water at HTHP	No activity	Steamed water at HTHP	Steamed water at HTHP
Soap Making	Additive	Glycerine, fragrance, natural additives (e.g. honey, sericin), preservatives	No activity	Glycerine, fragrance, natural additives (e.g. honey, mulberry leaves, sericin), preservatives	Glycerine, fragrance, natural additives (e.g. gac, honey, sericin), preservatives

Suwee, a QSDS official, said:

"Silk farmers cannot use pesticides or any other chemicals when rearing silkworms. However, they can use pesticides on their farms when they are not rearing silkworms. The problem is, before they can start rearing silkworms again, they have to wait for about two months to ensure the chemicals they used are no longer in the soil. Regardless, some chemicals might still find their way into the mulberry leaves, so it's better not to use them at all."

This research argues that QSDS' efforts to improve silk quality and productivity in rural communities directly helps to improve the sericin content in silk. To help to increase silkworm survival rates and enhance productivity, QSDS officials recommended that the sites included in the study utilised *slaked lime* and *paraformaldehyde 3%.* Both compounds could be purchased through QSSCs across Thailand.

As shown in Fig. 7.14, farmers used *slaked lime* and *paraformaldehyde 3%* to regulate silkworm humidity and kill pathogens throughout the silkworm cycle (QSDS, no date; Subramani and Somasundaram, 2015; Sujatha and Sathish, 2017). Figures 7.15 and 7.16 show a traditional silkworm rearing area and a modern silkworm rearing room.



Figure 7.14 Silkworms covered with lime and paraformaldehyde.

Most farmers took care of their mulberry farms by spreading homemade compost and/or artificial fertilisers about once or twice a year (Vollrath *et al.*, 2013; Astudillo, Thalwitz and Vollrath, 2015). Most of the artificial fertilisers they used were left over from other farms rather than purposely bought for mulberry cultivation. Part of the reason for this was, as sericulture was their secondary occupation after farming, farmers would utilise any available resources to reduce costs.



Figure 7.15 Traditional silkworm rearing place covered by a fine net to prevent insects and animals killing silkworms.



Figure 7.16 A silkworm rearing room at Poethong Charoen sericulture community enterprise.

Farmers trimmed mulberry branches and watered their farms during dry seasons, and to avoid contaminating the mulberry leaves they needed for silkworm rearing, some chose to weed their farms by hand (Vollrath et al. 2013).

Most farmers used scythes (Fig. 7.17) to cut grass on their farms, while some used petrol-driven hand trimmers and grass trimmers. Others used two-wheeled or four-wheeled tractors. A few farmers cleared grass using herbicides (*Glyphosate* or *Paraquat Dichloride*) once or twice a year (Caseley, Cussans and Atkin, 1991; Krishna, 2012). However, this was only done

during periods silkworm rearing was not being carried out. As with artificial fertilisers, the herbicides used were left over from other farming activities.

Nilawan, a 51-year-old female Huaysai farmer, explained why she decided to use Glyphosate:

"When I see a lot of weeds, I spray herbicide to get rid of them. Weeds stop mulberry trees from producing lots of mulberry leaves, but I only use herbicide when I am rushing to rear the next batch of silkworms."

On the other hand, Naree, a 50-year-old female Huaysai enterprise leader, reflected on how rare it was for silk farmers to use herbicides in her community*:*

"The reason we shave the grass off is because its steals nutrients from the mulberry trees. … However, we don't normally use herbicide or insecticide on mulberry trees because we won't be able to feed the leaves to our silkworms. They will die if we do. … In our community, only about one in every 30 people use herbicides on their mulberry farms. … Some people may still use them, but I don't use them myself because I'm the leader of this sericulture group. … I am trying to only use bio-products when doing sericulture."



Figure 7.17 Farmers using scythes to cut down grass on a mulberry farm in Chumtabong community.

This research shows that none of the producers used insecticides in order to protect their silkworms. As an alternative, they sprayed *homemade wood vinegar* and *fermented neem solutions* to repel insects from mulberry bushes (Poedi *et al.*, no date; Sakthivel *et al.*, 2014). On occasions when killing or dispersing insects proved impossible, they would cut off affected mulberry branches and burn them to prevent further infestation.



Figure 7.18 Collecting silk cocoons using a woven circular bamboo frame at Huaysai village.

Once silk cocoons were formed (Fig. 7.18) they were boiled in water and then kept at a temperature of 70-90°C. (Gulrajani, 1992; Haggblade and Ritchie, 1992). In Thailand, preparation temperatures are higher than those mentioned in Gulrajani's study (Gulrajani, 1992). This might be because the sites included in his study were at different altitudes to the sites included in this research. When the silk cocoons were fully prepared silk strands are reeled into silk yarns as shown in Fig. 7.19.



Figure 7.19 Silk reeling at Huaysai village.

To avoid damage to the silk yarns, sericin is extracted during the degumming process. As presented in Fig. 7.20, this involves boiling yarns or cocoons at HTHP in a pressure pot. (Haggblade and Ritchie, 1992; Javali *et al.*, 2015).



Figure 7.20 Extracting sericin from silk cocoons in a pressure pot.

Some farmers started weaving silk and/or producing soap as soon as they had silk cocoons. However, the production processes for liquid soap and soap bars are different and require different skills. In addition, capital costs also differ. As a result, soapmakers favour soap products that match their skill

sets and generate good profits. This tends to result in enterprises producing more of the types of soap their workers are comfortable with. However, community enterprise traders also dictate how much of a particular type of soap an enterprise produces. They take orders from consumers and this determines what each enterprise should produce.

This research demonstrates that enterprise workers were better able to forecast profits from soapmaking than forecasting profits from farming. While the sale of crops to factories was dependent on a number of issues, not least fluctuating market rates, enterprise workers were able to set soap prices with traders and could therefore estimate breakeven points and calculate profits before sales were made.

Alongside market instability, the risks inherent in agriculture are numerous. Farming can be impacted by production problems and environmental issues, and these combine to make farmers' incomes unstable and unpredictable (Huirne *et al.*, 2000; OECD, 2000; Musser and Patrick, 2002; Hardaker *et al.*, 2004; Kahan, 2008).

Typically, farmers could only harvest crops once or twice a year. Table 7.8 shows a planting and harvesting schedule that includes sericulture and soap making. Not really being able to estimate future income, most farmers borrowed money from banks. Despite such challenges, they reduced operational costs and kept their products unspoiled, selling high volumes of produce to local factories during the narrow one- or two-week annual window.



Figure 7.21 Soapmaking process at Nayaw-NaUdom enterprise.

In contrast to crops, soap is light, less bulky, and has a long shelf life (at least a year). It can be transported long distances in high volumes relatively easily. As a result, producers can deal with consumers and traders in a variety of locations. Likewise, to maximise profits they can leverage price strategies that are appropriate for a variety of situations. This offers a level of independence that makes exploitation less likely and reduces the potential for any individual group to dominate production or sales in the chain. Nonetheless, as in any business, there are risks associated with soap production. Consumer demands change and markets become more competitive, and producers have to adopt strategies to overcome such issues. That being said, when compared to farming, soapmaking (Fig. 7.21) is far less likely to be affected by environmental risks.

Naree, a female leader of Huaysai community enterprise, who increased her income from 5,000 to 50,000 baht a month by producing sericin-based cosmetics and silk handicrafts, commented:

"As far as my income is concerned, I earn about 20,000 baht a month selling soap and lotions. The difference between trading soap and silk cloth is how often sales are made. Consumers tend to purchase lower quantities of silk cloth and it is more difficult to sell because its more expensive."

Table 7.8 Timeline of farming activities and soap production at sericulture villages in Thailand.

Activities	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Rice farming	Plant →				Harvest		Plant →				Harvest	
Cassava farming											Start Planting and harvest it within 8-12 months →	
Sugarcane farming											Start Planting and harvest it within 8-12 months →	
Mulberry planting (tree lasts for 10-20 years)					Planting period				Planting period			
Mulberry harvest	All year round											
Silk production	All year round											
Soap making	All year round											

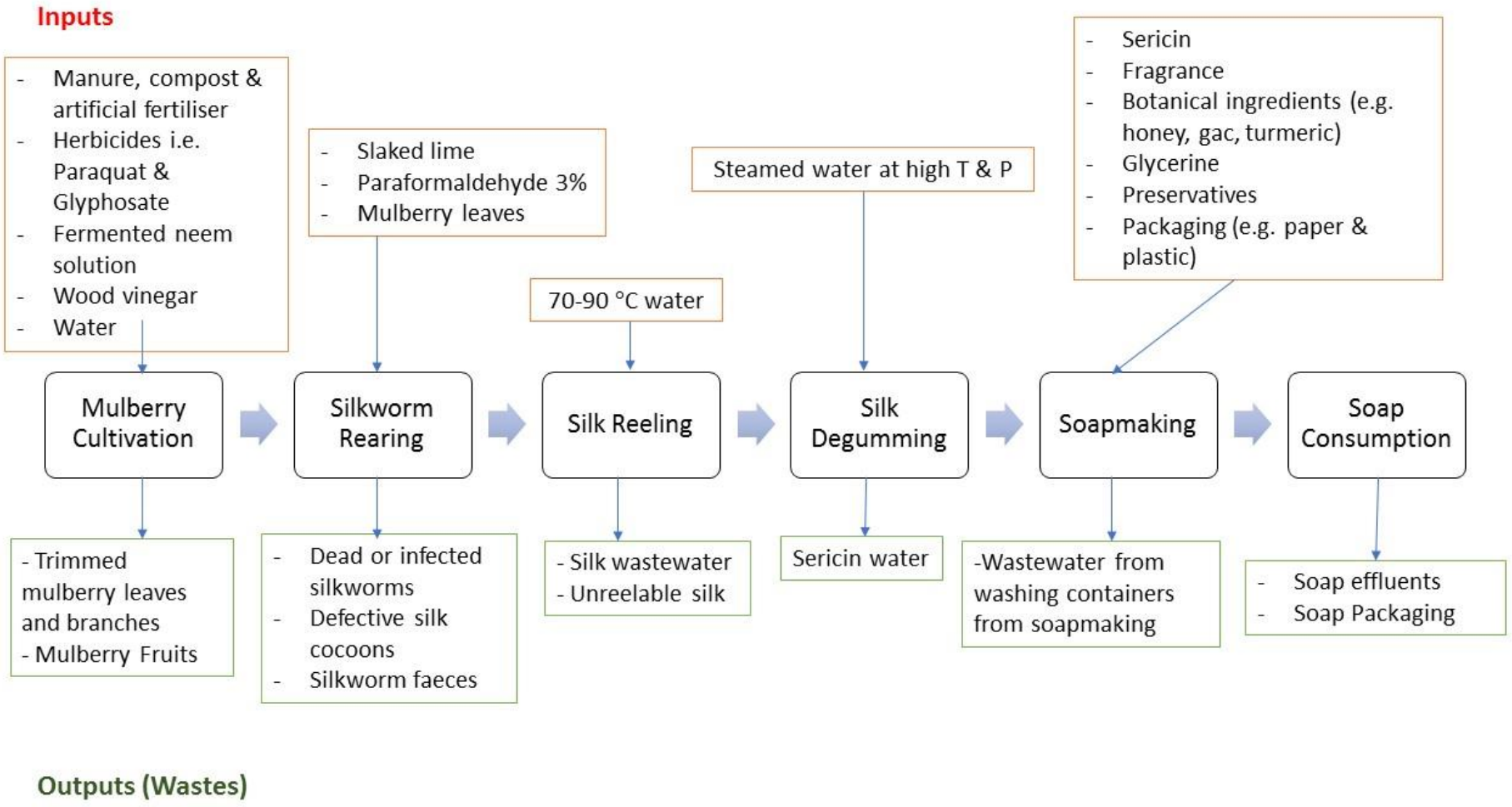


Figure 7.22 Input and output diagram of the soap production

7.2.3 Outputs of Soap Production

Table 7.9 Waste generated at each point in soap production.

Activity	Waste
Mulberry cultivation	Mulberry leaves and branches
Silkworm rearing	Mulberry leaves and branches; silkworm faeces; defective silkworms and cocoons
Silk reeling	Pupas and silk wastewater
Silk degumming	Sericin water
Soapmaking	Additive remnants from washing their containers

This study demonstrates that SMCEs took an environmentally friendly approach to soap production which included recycling waste. The study therefore complements Astudillo et al. (2014, 2015) who conclude that dealing with silk by-products effectively benefits local economies while enhancing environmental sustainability and reducing environmental impact.

Figure 7.22 and Table 7.9 summarise outputs generated at each point in soap production (Vollrath *et al.*, 2013; Astudillo, Thalwitz and Vollrath, 2014, 2015; Javali *et al.*, 2015). Throughout the silk process, the only waste which was not formally recycled was 'silk wastewater' from silk reeling (Fig. 7.24). This is because locals used it as fertiliser. Other waste (not including pupas) was used for making homemade compost (Fig. 7.23). This was either used in local farms or sold (Vollrath et al. 2013).



Figure 7.23 Leftover Mulberry leaves and branches, and dead/defective pupas were used for making compost.

None of the respondents felt that they were negatively affected by composting. This was to be expected as most respondents were farmers who recycled compost and used it on their farms to increase their crop productivity. Pupas were either consumed as a food (Fig. 7.25) or sold locally for about 120-150 baht per kilogram. This enhanced food security in their villages and helped generate additional income for soapmakers (Yhoung-Aree, Puwastien and Attig, 1997; Hanboonsong, 2010; Durst and Hanboonsong, 2015).



Figure 7.24 Wastewater from the silk reeling process released into the ground.



Figure 7.25 Fried pupas for human consumption.

This research shows that the economic benefits of soapmaking have motivated farmers to change their practices as far as treating wastewater from silk production is concerned. As they used all the sericin extract to make soap, no waste was released into the ground during the silk degumming or soapmaking stages of production. As a result, the impacts of soil degradation and water pollution have been minimised.

If soapmaking was not part of silk production, silk yarns would be degummed by artificial chemicals instead of using the HTHP method. Traditionally *wood ash lye* (Fig. 7.26) or *sodium carbonate* mixed with soap solutions were used to remove sericin from silk yarns before silk threads were dyed (Morton, 1989; Babu, 2012; Johnson, 2015). As shown in Fig. 7.27, before soap production existed, water contaminated with elevated levels of 'Biological Oxygen Demand', 'Chemical Oxygen Demand' and nitrogen residues was simply released into the land (Fabiani *et al.*, 1996; Pilanee Vaithanomsat and Kitpreechavanich, 2008).

While it has been promoted as a means to increasing income, agencies have tended not to focus on soapmaking as a strategy to reduce environmental pollution (TINT, 2010; QSDS, 2013; MOST, 2015). This research argues that in addition to helping alleviate poverty in rural communities, soapmaking is an effective conservation tool.



Figure 7.26 The silk degumming process using wood ash lye to remove sericin from silk yarns at Nayaw-NaUdom community in Buriram province.



Figure 7.27 Releasing silk wastewater into the ground.

Despite the recycling of waste during soap production, this research argues that because most soapmakers do not carry out wastewater treatment properly, soap postproduction can contribute to water contamination and land degradation. While it has never been the intention of farmers to waste the glycerine, botanical ingredients, fragrances and preservatives used to make soap, they might be released into the land accidentally when they wash their containers. This was more likely to happen at Huaysai and Nayaw-NaUdom community enterprises as they did not have a wastewater treatment plant. In contrast, to alleviate contamination Chumtabong enterprise had a rock filter system (Fig. 7.28) to treat wastewater produced by their cosmetic production house. This wastewater processing unit was introduced and funded by BEDO.



Figure 7.28 Wastewater processing unit at Chumtabong cosmetic production house.

Like the agricultural practices found at the sericulture communities, soap production involved the use of artificial chemicals and the release of waste into the environment. However, findings suggest that locals perceived the environmental impacts of soapmaking and silk production less harmful than those of the much larger scale agricultural practices they witnessed in their villages.

Interviews show that stakeholders did not feel that soapmaking activities caused any harm to the environment. Their reasoning for this was that soap production was normally a small-scale enterprise that took place around people's homes. In addition, when compared to agriculture fewer artificial additives were used in the soap making process, and they were used less often. The bulk of those interviewed were though negative about environmental impact of agriculture. Locals and government agencies therefore felt that when tackling environmental issues, soapmaking was not a major issue as there were other, more urgent issues they needed to address.

"Sericulture has no negative impact on our community because we don't use harsh chemicals. If sericulturists use anything hazardous on their mulberry farms, their silkworms will die. Nothing in sericulture is toxic," suggested Kriangkai, a 55-year-old male leader of NaUdom community.

"Sericulture doesn't negatively impact our community. We are more affected by the chemicals used in farming. For example, if people use insecticides on their sugarcane farms, this will affect our silkworm rearing," concluded Aree, a 41-year-old female Nayaw-NaUdom sericulture community enterprise leader and soapmaker.

"In our village mulberry farming helps to counteract the use of chemicals in agriculture. For example, rice farms can be quite dangerous because they use a lot of toxic substances. But it's safe to go to a mulberry farm because they don't use chemical additives. They use natural alternatives like silkworm faeces and manure instead," explained Chaiwat, a male Tambon Administrative Organisation official at Saodeaw sub-district who oversaw Nayaw and NaUdom communities.

7.3 Impacts of Soap Production

This research fills the gap in the literature by presenting that the soap business is an extension of sericulture and, as people can fill multiple roles in the business (leaders, soapmakers, community enterprise traders, etc.), it particularly empowers women and the elderly. This is in accordance with other studies that show that sericulture empowers women and supports women's roles (Singha, 1989; Yoshida, 1999; Earth *et al.*, 2008; Santitaweeroek, 2008; Dewangan, 2013; Eswarappa, 2013).

According to the World Bank (2016), the elderly are one of the main groups to suffer most from poverty in Thailand, especially in the North and Northeast of the country. As it is not especially physically demanding, the soap business is beneficial to elderly people who are no longer strong enough for active involvement in farming. Older people can play a variety of roles in the soap industry. Coincidentally, the elderly represent the largest demographic group at all of the sites included in this study (Chaimongkon, 2013; Nhong Manaw Sub-district Administrative Organisation, 2015).

This research argues that soapmaking can be used as a strategy to serve the purpose of SMCE and OTOP policies that focus on reducing poverty and creating more employment, especially in rural areas of Thailand (Harvie, 2003; Santitaweeroek, 2008; Natsuda *et al.*, 2012; Valeepitakdej and Wongsurawat, 2015). With simple production requirements and low start-up investment costs (especially when compared to farming), people in rural areas can easily benefit from a soap business. They can start a business themselves, and hire others to manage areas like production, packaging, marketing and trading.

Soapmaking incomes enhanced social and economic security and provided enterprise workers with some security against the wildly fluctuating incomes they received from farming and silk weaving. Specifically, this income was used to support their families and educate their children. However, the level of impact soapmaking had on individual enterprise workers depended on their individual practices and how their enterprises were organised.

Naree, a 50-year-old female Huaysai soapmaker and trader, said:

"Selling soap gives us regular income because we can sell it all of the time. When customers order our products, we simply go to the post office in Nontheng subdistrict and send them what they need. We sometimes have to stock soap in our houses, but normally I make about 100 soap bars and these can be sold in a couple of days."

This research maintains that while soapmaking projects can be scaled up by encouraging more sericulturists to recycle sericin water from silk production, the amount of soap individuals can produce is constrained by their skills, the time they have available, and their productivity. As a result, there is a limit to the extent soapmaking can help enterprise workers maintain steady monthly incomes. Despite this limitation, soap production offers the potential to improve enterprise workers' resilience and self-sufficiency. It could also offer similar levels of cultural protection and social support that agriculture offers farmers (Falvey, 2000). However, synergy between farming and soap production is entirely dependent on adherence to sustainable practices. Issues like overusing pesticides can easily negate any potential benefits for farmers/soapmakers (Rola et al., 1993; Wilson and Tisdell, 2000; Jitsanguan, 2001).

Nonagricultural work was crucial to women in rural areas as it helped them fight poverty and the unpredictability of agricultural productivity (Dennis, 1991). Furthermore, it offered soapmakers and community enterprise traders more self-reliance and independence. The product itself could be used for cleaning purposes and enhanced hygiene and well-being.

The enterprises included in the study chose to only use silk protein from Thai silk as the main active ingredient of their soap, and this was reflected in their marketing and promotion. This served to indirectly enhance the identity of Thai silk, and helped to enrich local heritage and tradition (Brown, 1980; Conway, 1992; Jory, 1999; Earth *et al.*, 2008; Sawasdee, Yodmalee and Phaengsoi, 2015). There is then a strong likelihood this would give locals a sense of pride and ownership and might encourage more people to work in their villages rather than migrate to the capital or other big cities. Being closer to their families would strengthen family relationships and support the well-being of individual family members (Parnwell, 1986; Bilsborrow *et al.*, 1987; Knodel and Saengtienchai, 2007; Paris *et al.*, 2009).

7.4 Summary

This research has employed the *Follow the Thing* approach to recognise the social relations, dominance, poverty, and exploitation inherent in soap production. Likewise, it has illustrated how sericulture community enterprises, soapmakers, community enterprise traders, and the environment are interrelated and affect each other along the soap production chain.

This research has also demonstrated that sericulture community enterprises act as a medium for the Thai government's support of entrepreneurial activities in rural communities. This support is given free of charge through government agencies (as part of the 2005 SMCE Promotion Act) and helps to enhance the socioeconomic well-being of local people. The study has characterised community enterprises based on seven areas that influence their roles and impacts. These include: 1) community enterprise management practices, 2) characteristics of community enterprise members, 3) government support, 4) operational soapmaking styles, 5) obstacles faced by community enterprise members, 6) profit-sharing schemes in community enterprises, and 7) contribution to communities.

This research has further demonstrated that sericulture community enterprises take the role of 'community developers' in the soap commodity system. It has further highlighted how local culture and characteristics of enterprise workers shape the organisational models favoured by community enterprises. Each community enterprise therefore offers individuals and communities differing levels of benefit. Likewise, enterprise workers and the community enterprises they work under have different impacts on the environment.

Soap bars and liquids were produced by Huaysai, Chumtabong, and Nayaw-NaUdom enterprises, while lack of manpower, poor marketing strategies, ineffective stock management, and lack of support from government agencies led Poethong Charoen enterprise to choose not to produce soap. Poethong Charoen rather focused on producing organic mulberry leaves and organic silk cocoons which have more consumer demand in their area. In addition, this research has highlighted transport issues as the major impediment to community enterprises obtaining equal and equitable benefit from government support in areas like marketing and trade. Besides, this

issue is shown to be a factor that makes soapmakers work in their own villages and rely on community enterprise traders.

The study has demonstrated how environment, socio-economic background, culture, interactions with stakeholders, knowledge, and the availability of technology influence producers' behaviour and lifestyles. This study has revealed that as enterprise workers still predominantly produce crops and silk for subsistence and commerce, soap production in Thai sericulture communities has not had a major impact on their lifestyles. Rather, it complements their existing lifestyles and offers them additional ways to earn income during off-farm seasons.

This research sheds light on the literature by revealing the approaches producers take to fight exploitation, dominance, and to address the potential for poverty reduction in the soap value chain. These include collaboration with both government agencies and community enterprise traders, and transparent profit-sharing schemes. This research has demonstrated that because of this support community enterprise workers are not at a disadvantage when making soap. This is different to other *Follow the Thing* literature which points out how chain actors are exploited and dominated (Winter, 2003; Cook, 2006).

Despite the measures taken to protect producers, as they want to concentrate on farming and avoid transport issues, this research has shown that they are still led by community enterprise traders (see next chapter) who sell soap to consumers, private traders, and government agencies, and control all soap orders.

By using the *Follow the Thing* approach, this research has revealed that the production of each type of soap has characteristics that are shaped by soapmakers whose socio-economic backgrounds and living conditions may be different. As such, soap production may have varying impacts on producers' lives. Likewise, as it is carried out by different actors, the distinct types of soap production can result in different social, economic, and environmental impacts on producers' communities.

This study has illustrated that soap production contributes to communities in terms of employment opportunities, income generation, and expense

reduction. Likewise, based in a tradition of silk production it helps to preserve tradition, identity and local heritage while empowering the elderly and women. It also highlights how women take a variety of roles in soap production that benefit local economies. These include roles as leaders, soapmakers, and soap community enterprise traders.

This research has demonstrated how soap production uses fewer chemical additives than farming, carries out in areas around soapmakers' house and helps reduce waste produced in silk production. As a result, locals often feel that compared to existing agricultural practices, soap production has a limited impact on the environment. Finally, the research has indicated how a zero-waste economy has the potential to strengthen the social safety net that supports rural sericulture communities.

CHAPTER 8-THE VALUE CHAIN 3: SELLING SOAPS - TRADERS, 'MIDDLEMEN' AND THE ROLE OF ENTERPRISE LEADERS

Only three out of the four communities (Huaysai, Chumtabong and Nayaw-NaUdom) that made sericin soap traded it. This chapter focuses on the midstream soap value chain actors involved in selling and trading and considers the socio-economic impacts of their practices.

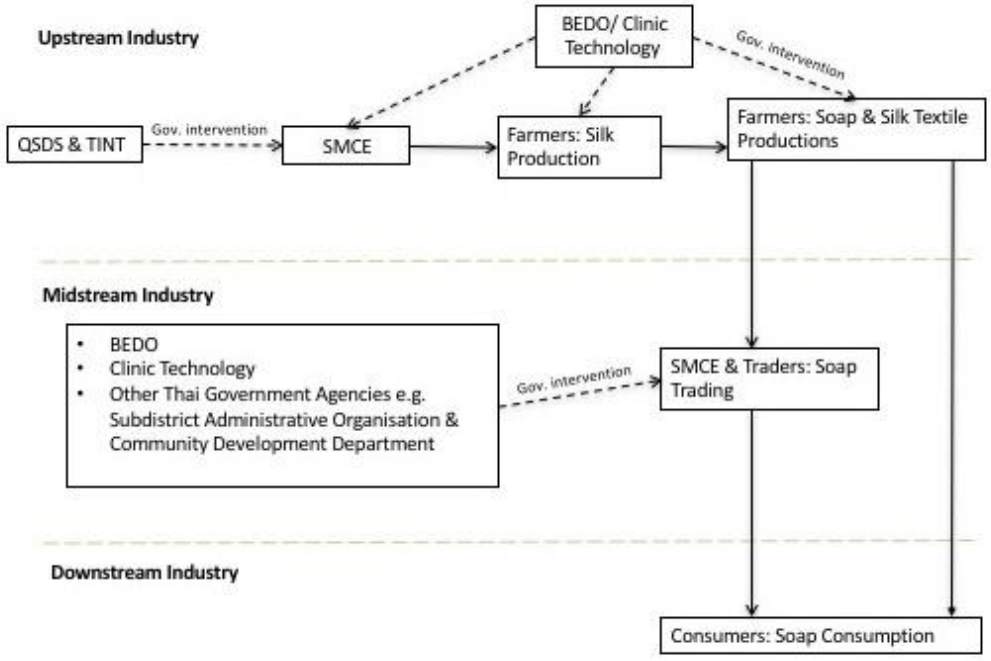


Figure 8.1 Overview of the soap commodity chain in Thailand.

As shown in Fig. 8.1, there are three parts of the commodity value chain: upstream (production); midstream (trade); and downstream (consumption) industries. These functions are carried out by different actors. SMCEs were positioned in both upstream and midstream industries, acting as intermediaries between soapmakers, traders, consumers, and government agencies.

Interviews and observations suggested that there were three kinds of traders involved in the soap commodity chain: community enterprise traders who were part of sericulture community enterprises and were the sales representatives of their groups; private traders who were not part of

sericulture community enterprises but who traded original or rebranded soaps; and Thai government agencies—the Biodiversity-based Economy and Development Office (BEDO) and Clinic Technology Offices (CT).

This research presents that traders helped to complete the market by assisting rural soapmakers (in the upstream industry) to sell their products to consumers (in the downstream industry). However, this may present the opportunity of exploitation due to their power of controlling the market over producers; this is likely if producers were dependent on particular traders, had poor knowledge in sales and marketing, and could not utilise Information and Communication Technologies (ICT) to their advantages (EU-Thailand Small Projects Facility, 2007; Graham, 2008, 2011b, 2011a; Molony, 2008).

This research argues that the chance of exploitation is reduced due to the presence of various kinds of traders which causes market competition. This is in accordance with Hayami et al.'s (1999) study which notes that a high degree of competition between middlemen makes it less likely for farmers to be exploited in the rice market in Philippines, yet different traders have different capacities and channels of distribution, so changing traders may or may not bring higher profits to producers. Likewise, others might argue that fixed prices of soap guaranteed by traders and the government would lessen the exploitation for producers and allow long term planning and investment for both parties (cf. Tables 7.2-7.4). This thus enhances the fairness and transparency in the trading process.

Trust is an important factor for the success of supply chain performance (Kwon and Suh, 2004; Jacinto and Pomeroy, 2011), as it allows market actors to spread transactions over time. Some soapmakers and traders may have already established trust with each other, meaning it would be less likely that these producers would change trading partners. Therefore, regardless of the choices available, the soap market is currently dominated by existing traders.

According to Tables 7.2, 7.3 and 7.4, some soaps are chosen to be traded and not traded by particular kinds of traders. This study thus argues that traders have influenced how soap is consumed in certain markets and how it is dispersed through their distribution channels. But, all kinds of traders help to expand the geography of soap consumption through their marketing

strategies and distribution channels, allowing both traders and producers to increase profits and support themselves. Trading both soap bars and liquids creates opportunities to serve different markets and to bring different profits to stakeholders, linking with different actors along the chain.

This study maintains that soap traders do not always financially benefit from trading soap. Different types of traders faced different risks and challenges when trading soap. This depended on the sales conditions and the operational costs they had to deal with, including transport, labour, food, accommodation, management, and investment. The distances between traders and consumers also affected costs. Traders also had to manage to sell their soap by its expiry date, which is set at 30 months after the production date (Food and Drug Administration of Thailand, 2011). Consequently, this influenced how traders carry out their lifestyles by doing various kinds of work to support themselves. Besides, the selection of transport modes chosen by traders also affects the environment (O'Mahony *et al.*, 2002; Eyring *et al.*, 2010; Lee *et al.*, 2010; Uherek *et al.*, 2010).

8.1 Community Enterprise Traders

Huaysai, Chumtabong and Nayaw-NaUdom sericulture community enterprises include community enterprise traders—intermediaries between soapmakers and other stakeholders in the soap commodity chain. The researcher interviewed six female community enterprise traders in total from these enterprises. This research fills the gap in the literature by presenting the roles of community enterprise traders as *educators, leaders, trade facilitators, brand ambassadors, gatekeepers, and community developers* in the soap value chain.

This research adds to the literature which considers the identities and roles of woman traders in various sociocultural settings (Hapke, 2001; Owusu and Lund, 2004; Lo, 2013). This highlights the gendered livelihoods and gender division of labour in the soap trading system. Female traders who were also farmers operated as community enterprise traders; men prioritised farming and stock raising over trading soap which was not seen as men's work since men tended to do work that required physical strength and left silk weaving and soapmaking to women. Thus, there were no male community enterprise traders present in these enterprises.

The female community enterprise traders interviewed had both agricultural and sericultural backgrounds. They cultivated rice for household consumption and external sale, and some grew cash crops such as sugarcane and cassava to supplement yearly incomes. Most traders also raised cattle, pigs, and chickens, and grew vegetables and fruit. During their free time, they also produced and weaved silk and made soap and lotions for household use and to generate income. In all cases, these individuals were farmers prior to taking up mulberry, silk and soap production and trade. Given the wide variety of activities they had to complete, they found their family workforce crucial sources of support.

With men more concerned with agriculture, gender division of labour impacted incomes. Compared with growing and selling crops and livestock, which offered men the potential to generate higher incomes through a single sale, women had to sell silk and soap throughout the year to make the same amount as men. As a result, they tended to stay involved in farming to stabilise their incomes.

This research argues that the intervention of community enterprise traders is key to improving the likelihood of an enterprise being successful. They control production rates and their market insights, skills and knowledge enable enterprises to reach a wider market and avoid overstocking certain kinds of soap. Traders provide a trusted avenue to assist soapmakers and use their personal distribution channels and connections to sell the products. Collectively owned enterprises authorised community enterprise traders to trade on behalf of other members, enter specific markets and trade with particular groups, while at privately owned enterprises the leaders were the sellers and had full control of which markets and groups they dealt with.

Huaysai and Nayaw-NaUdom community enterprises ran their businesses similarly, as they were both cooperative groups with members voting democratically every 2-4 years to appoint leaders as previously mentioned. Their business models relied on individual members becoming community enterprise traders and selling products on behalf of other members. In all case studies, community enterprise traders assumed the role of enterprise ‘leaders’. Rather than being called community enterprise traders they normally held titles that included chairperson, president of soap production, or treasurer.

By contrast, Chumtabong community enterprise was a privately-run business registered under the Thai Government SMCE scheme. Soap production in Chumtabong enterprise was predominantly a family affair, with outside labour hired to assist in production and packaging at a wage of 250 baht per day. In this enterprise, the producers and sellers were the president and vice-president of the Chumtabong community.

At all three enterprises, community enterprise traders acted as 'trade facilitators' and sold soap to consumers, private traders and government agencies on behalf of their enterprises. In the case of Huaysai and Nayaw-NaUdom enterprises, post-sale profits were shared between the community enterprise, community enterprise traders, and soapmakers. Tables 7.2 and 7.3 show how much each group received, and these amounts were based on criteria agreed with enterprise members. These criteria included how much money each person had invested in the business and the extent to which they contributed to the trading system. As each kind of soap generates different levels of profit producers and traders favour products that benefit them most. This therefore impacts the market sizes for particular types of soap and their geography of consumption.

Social kinship ties and mutually beneficial relationships help to reduce (or prevent) exploitation from traders to producers and in Huaysai and Nayaw-NaUdom the effect of social networks between traders and producers as well as a standard pricing strategy set by sericulture community enterprises helps to alleviate issues of exploitation from middlemen. This kinship benefit also pertains in other businesses as people value 'trust' in their social networks and for the trade transaction to occur (den Butter and Mosch, 2003; Santos-Granero, 2007; Forestier, 2010). However, by limiting the choices of traders, this may restrict the expansion of partnership beyond their enterprise connection (Forestier, 2010). As such, this may reduce the market expansion due to limited capabilities of traders chosen thereby limiting the geography of soap consumption and profit generation of the enterprises.

This research substantiates Owusu & Lund's (2004) study which presents that government policy clearly affects the environment of trading for female rural traders. Female community enterprise traders of soap overcame exploitation issues by receiving the government support from agencies such as QSDS, BEDO, CT, and sub-district administrative organisations, which

assisted them in terms of both human empowerment and economic development. These traders have taken advantage of being part of sericulture community enterprises which are nationally supported by SMCE and OTOP policies (Valeepitakdej & Wongsurawat 2015; Sitabutr & Pimdee 2017; Kemavuthanon 2014) by getting free booths at government fairs and marketing for their products nationally. This contrasts with other studies which demonstrate how female traders tend to be disadvantaged and overlooked both socially and economically in agriculture, fishery, and daily market industries; these studies do not suggest how these women can overcome these issues (Fafchamps and Minten, 2001; Hapke, 2001; Owusu and Lund, 2004; Jacinto and Pomeroy, 2011).

Traders also used e-commerce as an approach to expanding community enterprise markets. This approach allowed them to increase their customer base by contacting consumers directly. It helped to enhance the market value of each enterprise and increase returns to shareholders by improving brand and product recognition in a number of markets (Subramani and Walden, 2001). Figures 8.8 and 8.11 present websites that commercialised soap produced by Chumtabong community. As it was free to use, each of the enterprises in the study used Facebook and other social media sites to market soap (see Fig. 8.9).

As not all community enterprise members were capable of using the Internet and some did not use smartphones, only certain members were in a position to support online marketing and trade. While the heads of community enterprises/community enterprise traders were responsible for social media marketing they often lacked e-commerce skills. As a result, they did not put much effort into advertising their products online and generally did not realise much additional revenue from this distribution channel. Enterprises also found it difficult to establish the levels of trust required to develop an online clientele (Corbitt, Thanasankit and Yi, 2003). They lacked the technical expertise to create an effective and secure online presence that would be trusted for e-commerce purposes and often failed to provide the information potential customers needed (Corbitt, Thanasankit and Yi, 2003; Park and Kim, 2003).

Despite the benefits of advertising online, the Internet as a medium gives an enterprise’s potential customers access to information relating to the

products of its competitors. As a result, Internet users can compare prices and might make choices based on price. While this benefits the consumer, it might force a manufacturer to adopt a more competitive pricing strategy that reduces their profit margins (Brown and Goolsbee, 2002). As a result, there is a limit to which online commerce can raise revenues for community enterprises.

8.1.1 Community Enterprise Traders at Huaysai and Nayaw-NaUdom Communities

The researcher interviewed two community enterprise traders from Huaysai and two from Nayaw-NaUdom. In Huaysai community the enterprise traders were Naree (aged 50) and Benjawan (aged 38), both of whom were educated to primary school level. Depicted in Fig. 8.2, Naree and Benjawan are the chairperson and the president of the soap production of the Huaysai community enterprise respectively. Nayaw-NaUdom community enterprise traders are Aree (41 years old) and Pranom (aged 64 years old) who had the highest educations, to Bachelor's and primary school levels respectively.

This research argues that the sericin soap market expansion rate depends on soapmakers' and traders' capabilities. This will affect the scale and geography of the soap which influences the level of impacts on communities and the environment too. Huaysai and Nayaw-NaUdom community enterprise traders had a great deal of power to direct which markets their groups should enter as well as to decide the soap production rate that enterprise workers should follow since community enterprise traders were the ones who received orders from consumers and other kinds of traders. In return, community enterprise traders got commissions from selling soap for enterprise workers as presented in Tables 7.2 and 7.3. This was different from Chumtabong enterprise, in which soapmakers themselves exerted this control. One of the factors which allowed this to happen was because soapmakers had cars and were skilled in managing and dealing with consumers and traders.



Figure 8.2 Naree (left) and Benjawan (right) demonstrated soapmaking on a TV show.

Naree became chairperson of Huaysai enterprise in 2013, having been secretary from 2000 to 2013 helped her to accumulate skills and knowledge in the silk-related business and to develop strong connections in both the public and the private sectors. She introduced various initiatives to the enterprise, including requesting support from the CT office to help improve the group's silk dyeing and degumming techniques and to learn how to produce silk-related cosmetics. This led to the change of locals' behaviours by replacing artificial chemicals with natural additives. As a result, this helped to reduce their environmental impacts.

Unlike other sericulturists in her own group, Naree was one of a few people in her community who regarded the silk and soap business as her main job because they provided greater yearly income than farming. She generated an annual income of 20,000 baht from farming compared with 600,000 baht from selling silk textiles and soap. As she was the principal contributor to her family's finances, she was the leader of her family, not her husband, when decisions needed to be made.

Similar to other local farmers, Naree had grown up helping her parents farm and has been a farmer for about 40 years. She lives with her mother, husband and two children. She has been making and selling silk for 18 years

before she started making soap following training in 2011 from the CT Office of NRRU.

"*My income has increased significantly. In the past, I only produce*d *silk fabrics which were dyed by chemical colours. Now, with the support of MOST, I also sell sericin soap, silk handicraft scrubs and natural dyed silk cloths. My income increase*d *from 5,000 to 50,000 baht per month. I thus want to encourage other households to produce them too so they can have more money. I earn about 20,000 baht per month by selling both soap and lotions",* said Naree.



Figure 8.3 Filming interviews with Naree, Benjawan, and leader of the Huaysai community regarding their sericulture and silk-based cosmetic activities at their village. The broadcast was on a Thai TV channel.

Benjawan is the president of soap production in Huaysai community enterprise and has been farming for 20 years, generating about 600,000 baht a year. From producing and selling soap, she generated a secondary income of about 1,000-2,000 baht per month. Benjawan lives with her husband, daughter, and parents, who are also both farmers and sericulturists. This was quite typical in Huaysai village where each household consisted of a big family living and working together. She concentrated more on farming since that provided the majority of her income and she lacked workforce to work on her large farms. Similar to other members of Huaysai community enterprise, Benjawan was not as active in trading and marketing

soap as Naree. Nonetheless, both helped to advertise their group activities on various channels as shown in Fig. 8.3.

"*I am mainly working in farming. My part-time job is to produce soap. I started to produce soap because I am part of the [sericulture] group. I have been with silk and seen its benefits. I like it. After using it, I have benefitted from it. There were training sessions about silk and we also used silk for attire. In the past, I used to rear silkworms with my mother, but I don't know how to weave silk. Recently, I don't have time to produce soap because of my workload in farming*", explained Benjawan.



Figure 8.4 Community enterprise traders of Nayaw-NaUdom community sold their group's silk-related products at their local fair. Aree (left) & Pranom (right).

As presented in Fig. 8.4, Nayaw-NaUdom soap selling was undertaken by both chairperson Aree, the youngest member of the enterprise, and by the treasurer Pranom. Aree had been elected as chairperson in 2004. She was similar to other locals as she followed her parents into farming. She rented her land holdings for other farmers to grow rice and receives some rice in return. Her two daughters were away for study and worked outside the village, and her husband worked abroad and sent remittances back to support them. The remittance income allowed her to focus her time on the enterprise, earning 300,000 baht/year for silk weaving and 100,000 baht/year from making and selling sericin soap for the enterprise.

Pranom's lifestyle was similar to Aree's. Pranom had been farming for the past 50 years and earned about 100,000 baht per year from her rice farm. Pranom learnt how to produce and weave silk from her parents when she was young and had been doing sericulture for about 29 years to support herself. This is typical to Isan households which carry out both farming and producing silk at the same time, with the parents teaching the children (Conway, 1992; EU-Thailand Small Projects Facility, 2007). Her secondary income, of about 100,000 baht per year, came from selling silk fabrics, soap, and lotions. Pranom lives with her husband, children, and grandchild. Her house is used as an operational space for the Nayaw-NaUdom sericulture community enterprise so they can do activities together like silk weaving, silk dyeing, and soapmaking.

In both enterprises, community enterprise traders would go to various government fairs and local markets to sell their group's products and other members might join them when the events were on a big scale and required more people to take care of customers. Aree commented:

"Pranom and I can go to fairs alone to sell our products. But others don't dare to talk and sell. In that case, three or four of them usually go together in order to help each other speak [with consumers] and sell our products."

Both Huaysai and Nayaw-NaUdom community enterprise traders were responsible for dealing with private traders. They negotiated their sales on behalf of their enterprise. Naree commented:

"*Normally, my customers buy sericin soap for themselves. …Some merchants come to purchase our items to resell at their shops in town. But I don't really know where they sell them. Either they come to our house or we send parcels to their addresses*."

8.1.2 Community Enterprise Traders at Chumtabong Community

This study focused on two community enterprise traders from Chumtabong communities: Thida (Fig. 8.5) and Chulee (Fig. 8.6) who are chairperson and vice-chairperson of the enterprise respectively. Both Thida and Chulee are farmers, aged 65 and 42 years old, respectively. Thida is Chulee's mother. Thida had the highest education at primary school while Chulee graduated from high school. They live in the same two-storey house with other six

family members. All of them had engaged in farming, sericulture, and silk weaving prior to producing silk-based cosmetics. This household's major source of income was from selling sericin-based cosmetics which were mainly produced by their family. BEDO provided funding for their cosmetic production house and tools needed for making cosmetics. The cosmetic production house is located within Thida's house. It is next to a display room where they sell their silk fabrics and silk-based cosmetics. This was unlike other locals who gained most of their income from farming (BEDO, 2013). In addition, Thida's household generated supplementary income by selling silk fabrics and crops to local factories and consumers directly. Thida was the one who managed her family's finances and divided tasks among family and enterprise members. Thida stated:

"I am the producer and seller of sericin soap. I also help to allocate work to my enterprise members, so they know what to produce, such as silk scarfs and fabrics. Once their products are sold, they get their money straight away. They normally get around 4,000 baht a month. … Some members also come to help me package sericin-based cosmetics at my cosmetic production house. They get daily wages. Other people do not produce sericin based cosmetics like us because they lack tools and workspaces."



Figure 8.5 Thida (right) promoting her enterprise's silk-based cosmetics to consumers and visitors at her house.

Similar to other farmers, Thida and Chulee owned rice, vegetable, and fruit farms for family consumption in order to reduce expenses and for sales in

order to support their family. This also helped them reduce risks from unprofitable cosmetics business too. Typically, their family would hire their enterprise members to work in their mulberry farms, silkworm rearing, and sericin-based cosmetic packaging, for 250 baht per day. In addition, they were also hired for silk weaving in which the wage depended on the size of silk fabrics and techniques used.



Figure 8.6 Chulee demonstrated silk reeling while selling silk-based cosmetics and textiles at the national silk fair in Thailand. Source: Malee.



Figure 8.7 Malee (right) helped Chumtabong enterprise sell their silk-based cosmetics to consumers at a booth in the market, funded by BEDO.

Chulee, shown in Fig. 8.6, normally went to various fairs alone unless her family members and other members came to assist her. Likewise, she also managed e-commerce for Chumtabong business by herself (Figs. 8.8). Moreover, a local BEDO official, named Malee, who supervised this Chumtabong enterprise, sometimes helped Chulee to sell their cosmetic products at government fairs (Fig. 8.7). Chulee had been

dealing with various traders and consumers to secure their orders nationally and internationally with some assistance from BEDO. Of all enterprise members that the researcher dealt with, Chulee was the only trader who could communicate in English well with consumers, and this made her enterprise in a better situation than others when expanding the soap market. Moreover, she was the only community enterprise trader who did not face very difficult transport issues since she could drive to various events unlike other traders who relied on public transport and hiring drivers. This allowed her to save costs and maximise profits. Nonetheless, she was still struggling with trading silk-related products. Chulee lamented:

"When going to fairs, we need to set a daily target of 10,000 baht, we then make some profit. If we only make 3,000-4,000 baht, the small profits we make will go with expenses of foods, accommodation, fuel, expressway, and management when we join trade fairs. We won't be able to bring profits back to our community. It's all gone. Sometimes, I even had to use my own money to pay members later"

Thida's family had better incomes from selling sericin-based cosmetics than from selling silk fabrics. They generated 840,000 to 960,000 baht per year by selling cosmetics but less than 400,000 baht per year by selling silk fabrics. Yet, this was still much better than income from rice farming since her family could generate less than 100,000 baht a year from their 3.2 Ha farm, and this was not enough to support their family.



Figure 8.8 E-commerce to sell sericin-based cosmetics managed by Chulee. Source: (Taattong Farm, no date).

8.1.3 Contributions to Communities

A major point that this research found across all of the communities studied is that because the possibilities for non-farm and formal employment are limited in rural areas, financial and sociocultural necessities drive women to seek additional livelihood options. Income from trading thus greatly benefits family survival. This research is consistent with work by authors such as Owusu & Lund (2004), Hapke (2001), and Fafchamps & Minten (2001) and shows clearly that the income which female traders generate enables them to play roles of increased importance in providing food, educating children, and in general supporting their households.

In addition and similar to cases noted by Owusu & Lund (2004) and Overå (1998), this research demonstrates that the soap trading business endeavours engender household power and resource use for the women in question. This research argues that trading soap enables rural female farmers to be more socially and financially independent from men and gives them power in decision-making related to their businesses. In this situation, this research shows contrast results with other studies which commonly reveal men as decision-makers for activities in rural communities (Jewitt, 2000; Agarwal, 2001; Sikod, 2007).

Community enterprise traders in leading positions (such as chairperson, vice-chairperson, treasurer, and president of soap production) took multiple roles in the soap commodity chain and members relied on their abilities to help them sell their products. They assumed the role of 'gatekeepers' because they played a vital role in bridging the consumer market of soap from the village to international level. Therefore, they helped to empower their own communities, assuming the role of 'community developers'. Moreover, these capable women led group discussions to set up standards for profit sharing and prices for the group in order to enhance transparency and trust among stakeholders.

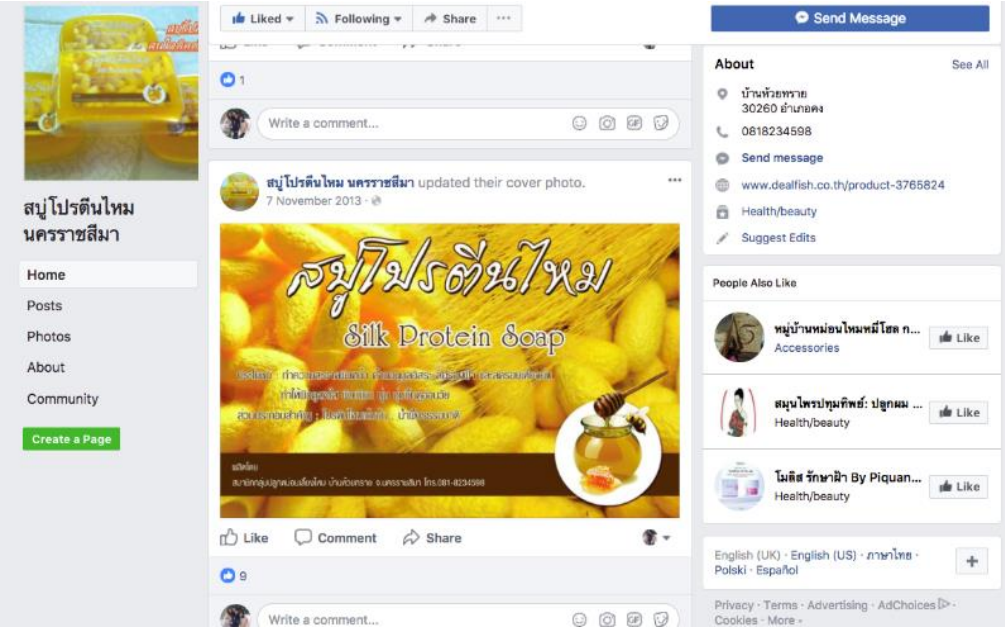


Figure 8.9 Soap Facebook page of Huaysai enterprise. Source: Facebook.

Taking the role as 'educators', Huaysai and Nayaw-NaUdom community enterprise traders shared market information with their members, along with consumer insights and business ideas which enabled members to produce soap that met consumer expectations. This led both communities to personalise their sericin soap formulas by adding botanical ingredients and improving packaging to attract consumers from various groups and to differentiate themselves from competitors. Consequently, this enhanced their enterprise opportunities to meet consumer demands and therefore generate more profits.

Since community enterprise traders helped to persuade their members to produce soap in addition to silk fabrics, this helped to diversify their enterprise's portfolios and to reduce risks from the silk textile business. Likewise, it also enhanced their enterprise funds which would be used to support their members and communities. Nonetheless, there were still issues of constrained productivity in all three communities, due to limits on human resources, time, finances, and capabilities. As such, there is a limit on the extent to which profits from soap businesses can support their enterprises, members and communities.

This research argues that community enterprise traders who have the same social and cultural ties as the producers help to emphasise the brand identity

and image of soaps produced locally by silk farmers. This study agrees with Subrahmanyan and Tomas Gomez-Arias (2008) who present that rural women who sell soaps and other products door-to-door locally are 'educators, brand ambassadors and promoters' of products sold. Higher brand awareness among consumers leads to higher purchase intention, better perceived quality of the products and higher market share (Dodds, Monroe and Grewal, 1991; Grewal *et al.*, 1998; Chi, Yeh and Yang, 2009).

8.1.4 Obstacles Faced by Community Enterprise Traders

Three main barriers faced by community enterprise traders prevented them taking soap to market, affecting sales and leaving them unable to rely solely on this source of income. These were: lack of formal certification by the Food and Drug Administration (FDA) of Thailand; lack of transport facilities; and lack of competitive advantage. Thus, for community enterprise traders soap profits only complement other sources of income.

Firstly, this research maintains that FDA certification affects both market expansion and consumer confidence and therefore demand. Neither Huaysai and Nayaw-NaUdom community enterprise had formal certification for their products. Lack of FDA certification restricts traders' opportunities to expand their markets nationally and internationally and impacts how consumers perceive the credibility of their brands, including the safety. Only Chumtabong soap was certified by FDA whereas Huaysai enterprise needed to use their existing funds first to build a production facility in order to be verified by FDA and Nayaw-NaUdom enterprise was still waiting for FDA review. Quality and safety standards are common issues faced by small producers, especially for export markets (Markelova and Meinzen-Dick, 2009).

Secondly, transport issues are found to be a major obstacle due to lack of public transport and limited access to personal cars. The majority of community traders used motorcycles, restricting travel over long distances. Only one out of six female community enterprise traders from this study owned and drove a car. This study is in accordance with literature which shows that women are more adversely affected by transport development than men (Turner and Fouracre, 1995). When going to government fairs, they had to use various means (e.g. hiring transport and/or taking trains, buses and taxis) to reach their destinations.

This research asserts that poor infrastructure and limited transport options significantly affect the geography of soap consumption since traders can only reach certain areas. This also leads to high capital costs and lower profits for traders. Many areas in rural communities were still not paved well, making travel and trade difficult for both traders and consumers. This contrasts with Ekasingh et al. (2008) who present that the Northeast region of Thailand has good infrastructure for traders to compete freely and actively with each other.

Rural traders had to spend more time on the road than traders who lived in areas with good infrastructures; this lowered their opportunities to increase their sales. Donnges (2001) argues that rural transport has its own distinct features which are characterised by people travelling for subsistence and socio-economic purposes. Despite this, community enterprise traders who overcome transport issues can use this to be their market power against soapmakers and other intermediaries.

Lastly, this research argues that lack of competitive advantage makes it harder for community enterprise traders to increase both sales and customer base. As previously touched on, this research found that limited skills and lack of experience of internet marketing and e-commerce were major constraints for online trade in these communities, especially at Huaysai and Nayaw-NaUdom community enterprises. This resulted in weak brand profile and reputation which led to low sales on their online channels and low exposure to the wider market. Therefore, their main sources of profits came from direct sales.

8.2 Private Traders

Both Huaysai and Nayaw-NaUdom soapmakers traded their soap to private traders via community enterprise traders who helped them secure deals. In contrast, Chumtabong soapmakers dealt directly with private traders because they lacked staff and wanted to reduce their loss through intermediaries. Interviews found that, in order to protect their privacy and business relationships, community enterprise traders did not reveal much information or their contacts of private traders. They commonly met each other at government fairs and through personal connections. In terms of purchase conditions, private traders either bought soap from the enterprises in cash or in the case of Chumtabong, on consignment.

This research maintains that power relationships between soapmakers/community enterprise traders and private traders as well as those between consumers and private traders are non-monotonic and depend on the circumstances.

Private traders play different roles in the soap value chain, as both *facilitators and exploiters* for soapmakers. In terms of facilitation, some private traders shared market insights and feedback on product improvement and pricing strategies with community enterprise traders and producers. In return, this mutually beneficial relationship between private traders and community enterprises benefitted both sides by increasing sales.

Community enterprises benefit from private traders through using their networks to reach unexplored markets (Forstner, 2004) while reducing their operational costs from management and transport. Their presence is known to be useful for sellers entering foreign markets (Schmidt and Ruiz, 1996; Forstner, 2004; Hingley, Lindgreen and Beverland, 2010).

Chulee, a Chumtabong soapmaker and seller, said:

"It is not difficult to do business with BEDO. However, it is challenging when dealing with gift shops and other businesses which are not government organisations. …For instance, the gift shop that I deal with sells my shampoo under our brand name at 99 baht, but I normally sell it at 65 baht, and the wholesale price is 49 baht. They sell more expensive than us which is the issue that we can't solve because we cannot demand them to sell them at our retail price. This makes it difficult for them to sell our products which means that we won't get profits from unsold items since we clear our bills every month. It is quite difficult to do business this way."

Mali, a 49-year-old private trader with Huaysai community enterprise, was a farmer who produced and weaved silk during her free time. She had been farming since she was 16 years old and grew up in a sericulture family. She is the leader of Baan Hua Sapan sericulture community enterprise in Buriram province and has traded soap from Huaysai community enterprise since 2014 with the help of Naree's negotiations. Baan Hua Sapan enterprise produced and sold silk- and mulberry-related products such as silk yarn, silk fabrics, silk clothes, silk scarfs, silk bedsheets, pupas, mulberry leaf tea, and

mulberry leaves. But they did not produce soap because there was no one who was interested in doing that and available to produce it. Besides, their members considered it difficult to produce soap. They retailed soap along with other silk textiles like Huaysai, Chumtabong and Nayaw-NaUdom enterprises at government fairs and local areas.

Mali explained:

"We trade soap to fill part of our value chain because my community enterprise doesn't produce it, even though we cultivate mulberries and rear silkworms. The majority of members prefer rearing silkworms and weaving silk. ...The reason we don't produce sericin soap is because it is difficult to produce and we don't like to do it. … Yeah, we have attended soapmaking trainings."

Lampraimart (LPM) shop, which engaged in private trading with Nayaw-NaUdom enterprise, sold more soap by volume than the community enterprise sold in their village.

Aree, a Nayaw-NaUdom leader and community enterprise trader, stated:

"Normally we have our incomes from direct sales to consumers and consignment sale from the Lampraimart gift shop. Typically, the shop manages to sell double of what we can in our village because the shop is big. They sell several kinds of cosmetics. Customers can buy various kinds of products at the same time. … Sometimes customers call me, but most of the time they go there because the store has more products."

Aree further commented:

"It's better to sell via Lampraimart shop because we can sell our soap in bulk. …We sent 5 dozen of soap bars to the shop each time. …Even though we get less money than if we sell it ourselves, we don't have to find customers ourselves. They have a bigger customer base than we do. Besides, when they help us sell our products, we don't have to find cosmetic bags for consumers or travel to meet consumers. It helps to reduce our expenses."

In Huaysai and Chumtabong, private traders bought soap and rebranded it at premium prices. On the contrary, private traders who dealt with Nayaw-NaUdom enterprise had not rebranded their products. It seems clear that traders who sold original brands helped to raise awareness of the community enterprises which produce them. Besides, this could have helped the enterprises build a brand loyalty because consumers could associate the brand names with the origins of the products and original packaging (Mohd Yasin, Nasser Noor and Mohamad, 2007; Jamal, Khan and Tsesmetzi, 2009; Godey *et al.*, 2012; Azuizkulove, 2013; Dhurup, Mafini and Dumasi, 2014). However, the level of effects depends on consumers' education background, age, nationality and culture (ibid). In contrast, private traders, who rebranded soap, prevented consumers from tracing the product back to its source, as well as concealing their trade routes from the producers and community enterprise traders. This thus prevented enterprises to build their loyal customers based on their brands.

This research demonstrates that some private traders took advantages of lack of competition in rural markets by trading there. This contrasts with results from Forstner's (2004)'s study which presents that private traders appear to be both exploiters and efficient actors who tend to move towards sectors with favourable higher returns while avoiding operating in more remote areas which lack infrastructure. But this research argues that private traders' exploitative nature is rather to be expected since they need to maximise profits and avoid being at the losing end in the market. Therefore, they took advantage of their information against producers, competitors and consumers.

Unlike when they trade with their own members, community enterprises could not control the selling prices of private traders and could not track where or to whom their soap was sold. Private traders rarely shared their market insights with the producer groups.

Chulee, a Chumtabong soapmaker and seller, stated:

"We regularly have traders who come to buy our soap. They will sell them online. They normally buy dozens of soap bars and liquids because they can get wholesale prices. If they want to use it for their own brands, they buy our soap without our packaging. I don't really mind it."

She further commented:

"I have no idea what brands will use our soap in the end. I don't collect this information. I don't dare to ask them. They may think I am fussy because they are my customers. Since we are doing business, we should not nitpick. I only know that they sell them in some provinces of Thailand or to neighbouring countries. That's all they told me."

This research argues that issues of exploitation by private traders are minimised when sales are negotiated through sericulture community enterprises, which set standard wholesale prices and trading procedures. As a result, soapmakers could still receive fair prices from any kind of traders; this contrasts with other studies which demonstrate that farmers receive unfair prices from traders (Jacinto and Pomeroy, 2011; Oguoma, Nkwocha and Ibeawuchi, 2011; Swamy, 2016). The aggregation of soapmakers under SMCEs thus provides negotiating power for soapmakers and community enterprise traders to counteract the demands and power of private traders. This corroborates Fischer & Qaim's 2010 findings which demonstrate that the collective action of farmers prevents exploitation both inside and outside the group.

This research contributes to the literature by using commodity chain analysis to reveal the dynamic relationships between soapmakers, community enterprise traders, private traders, and consumers in the soap value chain where none of the actors have dominated or overpowered the chain.

8.3 Government Agencies

The Biodiversity-based Economy Development Organisation (BEDO) and Clinic Technology Offices (CT) are government agencies which help sericulture community enterprises to trade soap. This research found them to work independently of each other and focus on different enterprises even though their development goals in terms of poverty alleviation and job creation using local resources based on OTOP and SMCE promotion policies were similar.

In addition to their role as traders, this research substantiates the literature by presenting the roles of these government agencies as *guarantors of*

quality, educators, facilitators, product and production promoters, and community developers in the soap commodity system.

The researcher carried out in-depth interviews and observation with two BEDO officials and three CT officials. BEDO traded soap for Chumtabong community enterprise whereas CT offices from Buriram and Nakhon Ratchasima Rajabhat Universities traded soap for Nayaw-NaUdom and Huaysai community enterprises respectively.

Both BEDO and CT assisted sericulture community enterprises in product development, production, product quality assessment, product and packaging design, and marketing. In addition, they encouraged these enterprises to set trade standards that increased transparency and fairness while avoiding conflict and ambiguity in their operations. However, the way BEDO and CT traded soap was quite different from each other.

Consumers could purchase most kinds of soap directly from BEDO's *'Fahsai Gallery'* store in Bangkok (Fig. 8.10) and via the *'Fahsai website'* (Fig. 8.11) which BEDO operated. In addition, BEDO occasionally allowed Chumtabong enterprise to set up a booth in front of the Fahsai Gallery store (Fig. 8.10). When a sale was made BEDO would share profits with the enterprise. Profits from sales at *'Fahsai Gallery'* store and BEDO's website were paid on consignment and this is outlined in Table 7.4. Additionally, 5% of sales made through Chumtabong enterprise's booth would go to BEDO.

Conversely, consumers could not buy soap products directly from CT websites. Rather, visitors were directed to contact the sericulture community enterprises. Thus, consumers needed to talk to either producers or community enterprise traders to purchase soap. The intention was to reduce the potential for miscommunication between producers and consumers. However, this research argues as convenience of purchase is one of the factors consumers use to make decisions the inconvenience of this approach may encourage them to purchase products from other sites with e-commerce capabilities.



Figure 8.10 Chulee opened her booth to promote and commercialise silk-based cosmetics and silk textiles in front of the Fahsai Gallery store in Bangkok, Thailand.

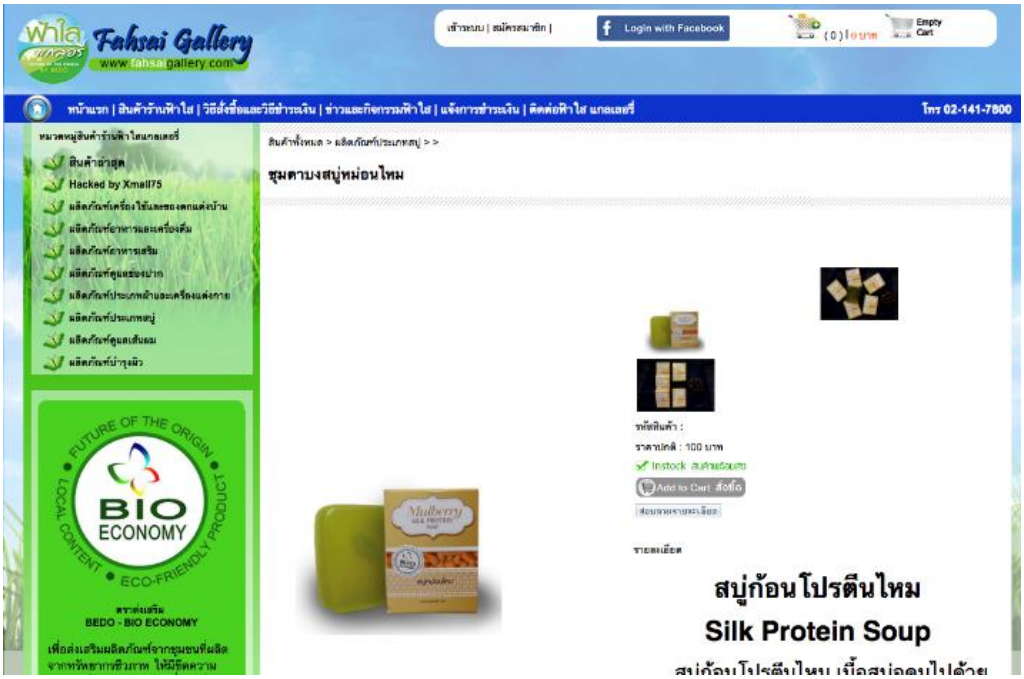


Figure 8.11 Chumtabong soap sold on the Fahsai Gallery website, managed by BEDO. Source: (Fahsai Gallery, no date).



Figure 8.12 Naree and CT officials from NRRU went to exhibit silk-related products from Huaysai enterprise at a government fair. Source: Naree's Facebook.

Consumers were though able to buy soap from CT teams at road shows in government fairs (Fig. 8.12). As shown in Table 7.4, while BEDO would take a percentage of revenue generated by any sale, CT would return all profits to their enterprise partners (Tables 7.2 and 7.3). This research thus shows that both agencies have different profit-sharing schemes with community enterprises, leading to different proportions of profits generated by enterprises when trading with different agencies.

This study argues that the geography of consumption of each type of soap is different based on the various distribution channels and marketing strategies provided by government agencies. These agencies perform the same roles as 'traders and market facilitators', helping enterprises to expand soap markets in areas that they have traditionally not been able to reach. By participating in market development, government agencies help alleviate market failure (Abbott, 1987; Carney, 1995; Jacinto and Pomeroy, 2011) and prevent exploitation by middlemen in the value chain, making the competition fair for everyone (Oguoma, Nkwocha and Ibeawuchi, 2011).

Yongyuth, a CT official, commented:

"We help community enterprises to distribute their products nationally by advertising them on the university and MOST websites. We don't charge the enterprises so the total profit belongs to them. This is because our Rajabhat University [affiliated with CT] is a local organisation which supports local communities. … We don't get any of the profits. It all goes to the community enterprises. We don't ask for anything from them. Our role is to give them knowledge so they can enhance their incomes and create stable jobs. Other government institutes are similar to us in that they don't take anything from the enterprises. Our aim is to encourage enterprise members to have supplementary occupations which, if necessary, could become their main jobs in the future. All of the CT programmes are like this."

Both CT and BEDO adopted a people-centred development approach to empower people as part of their community enterprise development plans. This was evident when both carried out surveys to discover what the majority of locals needed, before providing free training and support materials from experts in a variety of fields, such as financial management, soapmaking, marketing, and sales. Moreover, BEDO assigned a local officer, who was also a local of Chumtabong district, to supervise Chumtabong community enterprise. She visited them every week and reported their progress to BEDO. Likewise, CT had teams working with researchers from local universities, who would supervise and visit Huaysai and Nayaw-NaUdom enterprises one to two times per month. Both agencies could be contacted directly if individuals or communities needed more help. Furthermore, CT projects undergo an annual assessment including third party evaluation of their performance. The assessment team acquired information about areas soapmakers wished to improve or where they needed more assistance in the following year (Fig. 8.13). These ongoing interactions between agencies and locals certainly helped stakeholders to develop trust and to improve their productivity and business performance. By assuming the role of 'community developers', this research argues that agencies' impacts lead to *human empowerment, economic empowerment and environmental conservation* in sericulture communities.



Figure 8.13 The yearly assessment of CT program at Huaysai village. Members of sericulture community enterprises were encouraged to participate in the meeting and share their experiences.

In order to increase community enterprise sales, both BEDO and CT used various methods to improve soap quality and increase consumer bases for the community enterprises. First of all, by performing the roles of 'educators, product and production promoters and guarantors of quality' they trained soapmakers to standardise their products with specific formulas and tested the safety and effectiveness of their products before launching them in the market. Random tests were carried out to check quality consistency as well. Afterward, agency assurance of product quality helped soap sellers and traders to approach consumers with more confidence and credibility. Unfortunately, this information was still not properly advertised to consumers. Most consumers only obtained this information when purposely discussing with soap sellers and agencies, seeking information before purchase. Furthermore, BEDO issued the Bio-Economy logo to guarantee that Chumtabong soapmaking was environmentally-friendly. Conversely, CT did not have this. Nonetheless, there is no study which examines to what extent these standards affect consumer purchase decisions yet.

Secondly, agencies provided funding for these enterprises to develop their brands, logos, and packaging in order to strengthen their brand image and

credibility. However, it is uncertain to what extent this branding meets consumers' preferences and leads to profit generation.

This study shows that both BEDO and CT supported efforts by sericulture community enterprises to minimise the environmental impact of soap production. BEDO funded a sewage treatment plant to treat wastewater from the Chumtabong cosmetic production house before releasing it to the environment, but this was not found in communities supported by CT. Nonetheless, soapmakers who were supervised by both organisations were found to reduce the use of synthetic chemicals in their soap production and sericulture activities. Furthermore, Chumtabong enterprise also used part of their profits for natural conservation projects such as planting more trees in their local area. For example, Thida's family grew various kinds of trees on their own land to fulfil BEDO's requirements so it would continue supporting their operations. This was because it was also part of BEDO's vision to conserve the environment; this was not present in CT (MOST, no date; MOST, no date; BEDO, 2014). Despite this, CT still dealt with various environmental issues in communities but not for all activities of the soap production cycle.

Malee, a BEDO official at Chumtabong community enterprise, noted three criteria that community enterprises had to follow:

"First, they need to create more value added from local natural resources. Second, the production method of the commodity has to be environmentally-friendly. Third, part of their revenues needs to be used for reforestation. For instance, they should have activities for natural conservation and planting trees. When they are planting mulberry trees, they need to do it sustainably, so they won't disturb forest areas."

Pisut, a BEDO official, further added:

"Income generation is the important impetus for many things but we will never neglect the environmental conservation aspect of communities. …We expect them to be able to take care of themselves by using their local natural resources in a sustainable manner. Meanwhile, they should also conserve the environment so their natural resources will not be depleted."

Likewise, Yongyuth, a CT official, said:

"Since 2011 up to present, we support [the community] not to use any synthetic chemicals in the process of the silk fabric production. So they reduce their usage of those chemicals but it may not be 100%. For instance, the community increasingly changes from using artificial fertiliser to compost fertiliser in their mulberry and crop farms."

This research reveals that CT tended to measure the economic outcome before social and environmental impacts but BEDO attempted to balance all aspects when evaluating their community development projects. Hence, this research contends that that these policy differences lead to different kinds of growth of communities.

Chawalit, who oversaw CT projects, stated:

"At the end of the year, we have themes for third party assessments to evaluate the performance of community enterprises to see whether they have achieved the objectives of their individual projects. Furthermore, we also have done satisfaction assessments of this project with enterprise members. …But we mainly emphasise economic development, not social and environmental aspects. We rarely assess environmental impacts. Under the development concept, we have to create more value added from the money invested in the project. Let say if you invest 100 baht, you need to make 150 or 120 baht out of this. If we cannot create economic value added, we don't need to evaluate other things. Hence, the first thing we need to evaluate is whether locals have higher income after joining this programme. We check the average income of the group."

This research shows that CT and BEDO provide different partnership strategies with community enterprises. The CT programme worked with SMCEs for three years (MOST, n.d.). Depending on their progress and the third party project assessment by researchers from different universities in Thailand, the programme would be extended for two more years if the enterprises had the potential to be promoted as a *Head of Science and Technology Village*. But, it had to pass 87% of the assessment. During this period, the enterprise would receive further training and marketing

assistance. The budget allowance to support each community enterprise was around 1,500,000 baht.

Yongyuth, a CT official, commented:

"If a community enterprise wishes to upgrade its status to Head of Science and Technology Village under the CT programme, it has to share its knowledge with at least three communities. This means CT will assist in finding other communities and link them so they can be developed as the Head of Science and Technology Village too. For instance, guest speakers from Huaysai village who are experts in various kinds of technology will transfer their knowledge to their networked villages."

Yongyuth elaborated on the differences between the Head of Science and Technology village and their network villages:

"The Head of Science and Technology village and their network Science and Technology villages don't have to produce the same products. There is some similar technology that they will receive under the same trainings such as sericulture and dyeing silk techniques. However, each sericulture group has their own uniqueness so their weaving techniques are different based on their cultures. Hence, their silk fabrics can be distinguished from each other. … Besides, before we transfer technology to the village, we have to ask them first what they want and what they are good at. Thus, the technology that each village receives may be different."

This research argues that the roles of the education institutes under the CT program (including Buriram and Nakhon Ratchasima Rajabhat Universities) are to deliver technologies from their research groups to rural communities and enable them to apply their use in the success of their business activities.

This research shows that this program was linked with local universities in order to utilise their human resources and technology and research capabilities. Researchers or university lecturers under CT's networks are asked to share their knowledge with community enterprises. As a result, there is a practical application of their work and researchers are able to support the local economy while gaining a greater understanding of what issues needed to be studied and tackled in their local areas.

Yongyuth, a CT manager from Nakhon Ratchasima Rajabhat University (NRRU), explained how NRRU had assisted Huaysai community:

"NRRU has industrial product design and arts programmes. The heads of the programmes assist community enterprises in designing their packaging. Once they finish, our CT group finds a store to print the packaging for the enterprises using the funds we have available. But if we use up our funds, the enterprises have to pay any extra costs. We have several channels to support the distribution of community products. We have our university network and provincial network as well. We also invite community enterprises to do roadshows so they can trade their products in different locations."

Chawalit, a MOST official, further clarified:

"The technologies which are transferred to local communities come from organisations under MOST, local educational organisations and research experts. Researchers have enough funding to complete their research projects, but they don't have any available budget to transfer these technologies to locals. As CT offices are under MOST, we have budgets available to transfer this technology to locals through educational institutions. This is the concept of the CT programme."

In contrast to CT, BEDO set no restriction period on supervising enterprises as this depended on the enterprises' capacity and conditions. Consequently, this allowed the agency to sustain their programme without setting a finite amount of time to partner up with any enterprises. Yet, this may lead to dependency which could undermine the sustainability and long-term effectiveness of the group (Markelova and Meinzen-Dick, 2009).

Unlike CT, BEDO did not strategically work with local universities to transfer knowledge and technology to local communities. This may allow them to introduce new knowledge and technological advance to communities by obtaining it from experts in other areas. However, this is done at the expense of not fully utilising their local human capitals which may provide the same results or effects too.

Pisut, a BEDO official, revealed:

"There is no limit on how many years we are going to assist certain communities that we already selected. It depends on the potential and context of each community. Sometimes we only assist them for one to two years but some of them have been with us almost ten years now. The finish line depends on the result of BEDO's assessment in which we normally have ongoing monitoring. They need to be able to progress by themselves first, and then we can let them go. Once we are done with some communities, we will invite new ones to join us."



Figure 8.14 Chumtabong enterprise opened their booth in Vietnam to sell their sericin-based cosmetics with the assistance of BEDO. Source: Waranya's Facebook.

BEDO was found to be more successful in expanding soap markets than the equivalent CT. This was because it had more channels of distribution and platforms to help export soap while increasing product recognition through international expos (e.g. in Vietnam, Laos, the United States, and China) as shown in Fig. 8.14, whereas soap retailed by CT still mainly concentrated in the domestic market. Community enterprises which partnered with CT needed to acquire further assistance from the Ministry of Interior and the Ministry of Commerce when planning to export their products. This study corroborates Seixas and Berkes's (2010) findings which note that a redundancy of functions of community enterprises' partners helps to build resilience into the project and may be important to sustain the project when some partners may be weaker or stronger than others. This certainly applies to sericulture community enterprises as various institutions come to assist them in similar areas to enhance their ability to build capacity and expand their markets.

In terms of market competition, enterprises supported by BEDO were more likely to avoid direct competition with each other than those supported by CT. This was because BEDO encouraged enterprises to differentiate their

products in the market and would not offer guidance to organisations that produced the same products and retailed them in the same location. Rather, it emphasised and promoted each enterprise's unique selling propositions. Only Chumtabong enterprise was advised to use sericin as an active ingredient for their cosmetics and other enterprises were advised to use other natural ingredients which they could find locally to produce cosmetics or other kinds of products.

CT encouraged sericulture community enterprises involved in similar activities to network and share knowledge. As a result, many enterprises learned to produce soap from each other. This research argues that CT's approach might cause enterprises to compete with each other and this could impact their pricing strategies and their abilities to reach their target markets. Ultimately, this competition could result in enterprises reducing the costs of their products. Conversely, it might have the beneficial effect of forcing each organisation to consider what differentiates their products from those of other enterprises. As a result, they may make improvements to the quality of their products and improve in areas like packaging and promotion.

While CT offers a number of benefits to community enterprises, there are some potential drawbacks. As the organisation supports a large number of enterprises and trades in each of their products, there is an abundance of availability and little scope for enterprises to effectively brand their products. This makes it difficult for enterprises to establish brand loyalty and promote customer retention. Eventually, this could impact sales and their ability to generate revenue.

On the other hand, BEDO remained actively involved in transferring sericin-based cosmetic production knowledge and technology, specifically to Chumtabong community, but also more generally to other enterprises that requested their assistance.

This research argues that sharing the same soapmaking technology with rural communities in Thailand could result in market saturation. Without strategic planning, offering products of a very similar nature in the same market could result in enterprises experiencing reduced revenues and negative impacts on soapmakers/traders' profits. Under such circumstances it is unlikely that they would be able to address issues of employment and

poverty, or impact problems related to socioeconomic inequality. As such they would have failed to achieve OTOP and SMCE scheme objectives.

Although both government agencies contribute positively to local communities, this study argues their different partnership strategies with different marketing and profit-sharing schemes can lead to different economic growth in different rural Thai communities. Consequently, this may exacerbate social and economic disparities among rural communities. This research further asserts that this works against the very purpose of the SMCE promotion scheme which these agencies try to support.

8.4 Market Map of the Thai Soap Value Chain

Figure 8.15 shows a market map of the value chain of Thai sericin soap produced by small and micro sericulture community enterprises, following the guideline approach suggested by Practical Action (2012). The market map was used to visualise market systems which comprised three areas: the market chain, the supporting inputs and services, and the enabling or disabling environment. Practical Action notes that the market chain is the core of the market system, which consists of chain actors who own goods and services along the chain. The enabling environment is like the *rules of the game* which influences how the market chain, inputs, and service provisions operate. Practical Action points out that the environment can have positive, negative, or ambiguous impacts on the market system.

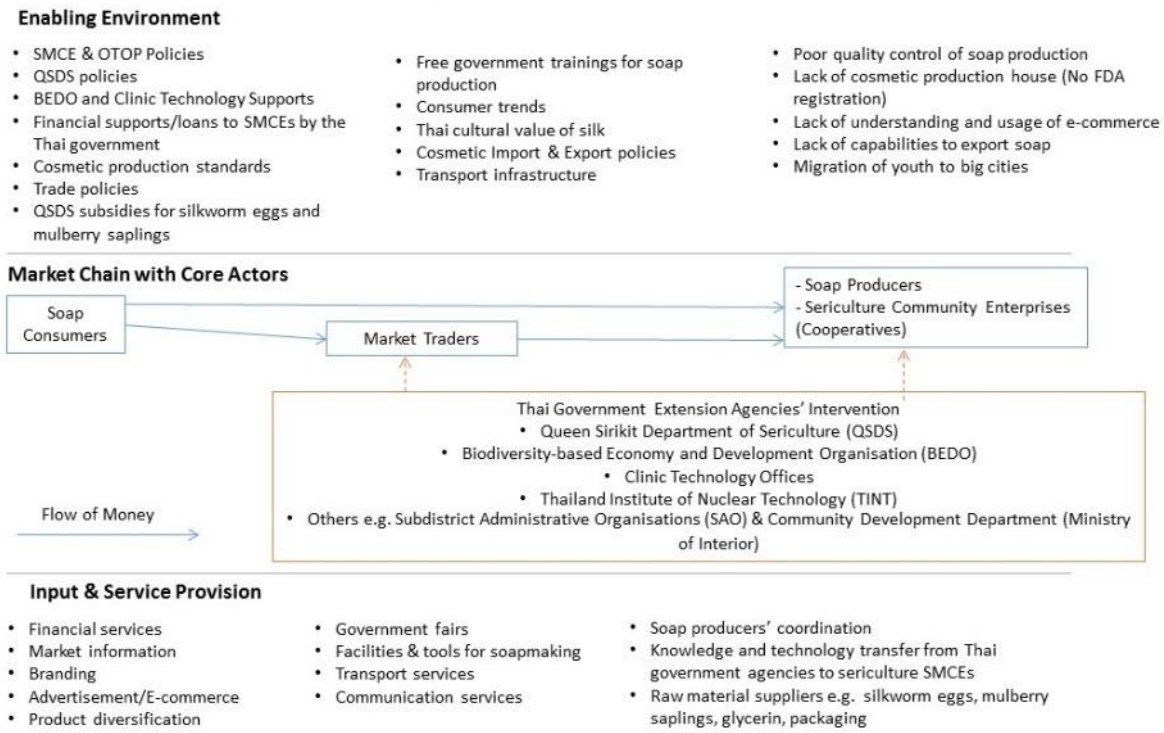


Figure 8.15 Market map of the value chain of sericin soap produced by small and micro sericulture community enterprises in Thailand.

The market map of soap demonstrates that the system depends on consumer demand because consumers control the flow of money. All factors listed in the enabling environment and input and service provision space in Fig. 8.15 were previously discussed in this research.

8.5 Summary

By using the *Follow the Thing* approach, this study has identified three types of soap traders involved at the village level in Thailand: community enterprise traders, private traders, and government agencies which are the Biodiversity-based Economy and Development Organisation (BEDO) and Clinic Technology offices (CT). All are in the midstream industry of the soap value chain. This research has investigated their roles and socioeconomic impacts on communities in Thailand. The similarities and differences in soap trading and profit generations in Huaysai, Nayaw-NaUdom and Chumtabong enterprises by various traders have been identified. Both Huaysai and Nayaw-NaUdom enterprises were found to run as cooperatives whereas Chumtabong enterprise is a privately-run business. All three are registered as small and micro sericulture community enterprises, and the different trading approaches lead to different risk and profit profiles.

This study found that all kinds of traders affect the geography of demand for and consumption of soap nationally and internationally. They help connect soapmakers with consumers in areas and markets which are not accessible by producers themselves. Many producers have *limited knowledge, transport options, resources, social networks, and finances* which restricts them from expanding their soap markets. By reaching to consumers, traders gain power and authority over producers in expanding producers' markets outside their villages. Thus, the traders' marketing and channels of distribution influence geography of consumption of soap. In addition, this study argued that traders are beneficial to soapmakers rather than causing harm or creating inefficiencies in the system.

Commodity chain analysis has identified the roles of female community enterprise traders as *educators, leaders, trade facilitators, brand ambassadors, gatekeepers and community developers.* This study has emphasised the roles and contributions of women, particularly in the community development context. Soap trading empowers female community enterprise traders. Likewise, this research has demonstrated how these female traders are empowered on behalf of their enterprises to join certain markets and trade with particular clusters. Furthermore, it has shown that trading soap allows female traders to be more socially and economically independent from men. Consequently, this reforms the sociocultural relations between the two genders, where some women play dominant roles in supporting their family and business instead of the men doing so, which is more typical in rural communities.

This research has recognised contrasting roles of private traders which are both *facilitators and exploiters.* Based on their trade facilitation, some private traders have suggested improved product features and pricing strategies to producers and community enterprise traders. This helps stakeholders to increase their benefits as a whole. Nonetheless, there are some private traders who exhibit exploitative natures and take advantage of their market insights in order to maximise their profits and avoid being at the losing end in the market.

The exploitation of soapmakers by middlemen has been minimised by the presence of sericulture community enterprises' pricing strategies—which help stakeholders to secure their fair shares of profits, by intervention from

government agencies and by the assistance of community enterprise traders. These enterprises are guided by government agencies which encourage members to set trade standards to increase transparency and fairness while avoiding conflict and ambiguity in their operations. However, private traders are found to be the only actors that enterprises have no controls over in guiding their selling prices. Likewise, the distribution and trade routes of private traders are more obscure than those of other traders because private traders, unlike community enterprise traders and government agencies, have no personal relations with the enterprises.

Government agencies have been defined as *guarantors of quality, educators, facilitators, product and production promoters, and community developers.* This study has shown that agencies assist sericulture communities in terms of human empowerment, economic empowerment, and environmental conservation. But different partnership strategies of these agencies may degrade the effectiveness of SMCE promotion schemes and ironically even promote socioeconomic disparities among rural communities.

This research has highlighted both the contributing and the exploiting roles of traders in relation to communities and shown that community enterprise traders and agencies mostly perform contributing roles, whereas private traders exhibit both kinds of nature in the soap value chain. This study points out that the presence of community enterprise traders and agencies has helped soapmakers to avoid being at the losing end of market asymmetries. Nevertheless, it is clear that all kinds of soap traders directly and indirectly support soapmakers socially and economically.

Following soap has shown interactions between various kinds of traders, revealing the power relations, and politics among the parties. It illustrates that the power between traders and producers is non-monotonic and depends on circumstances. Furthermore, this study contributes to the literature by using commodity chain analysis to reveal the dynamic relationships among soapmakers, community enterprise traders, government agencies, private traders, and consumers in the soap value chain, where none of the actors have solely dominated or overpowered the chain.

This study argues that because there are many kinds of traders present in the soap value chain, the chance that soapmakers will be too reliant on particular individuals is relatively low, and this helps to reduce their chances of being exploited and overpowered by particular traders. However, this may come at the expense of the various capacities and distribution channels of traders, along with previous relationships and trusts already developed. However, since some soapmakers choose to trade with certain traders with whom they have already established trust, the soap market is still overpowered by certain groups of traders. Likewise, this study has shown that exploitation can be alleviated or prevented by development of personal relationships between traders and producers and by standard profit allocations set by enterprises.

This research has demonstrated that socioeconomic impacts of nationwide SMCE and OTOP promotion schemes affect producers, traders, and intermediaries of soap, especially rural women, with different profits and risks associated with challenges that need to be overcome by each actor. As such, the political support of the Thai government is an important force that drives the success of soap markets both domestic and international.

CHAPTER 9-THE VALUE CHAIN 4: CONSUMERS

This chapter analyses the socio-economic backgrounds, identities, lifestyles and preferences of consumers and non-consumers of sericin soap bars and liquids. Qualitative data was acquired through observation and interviews with eleven Thai consumers of sericin soap products purchased either directly from producers or through traders in Thailand. The Thai study participants were selected based on the following criteria: i) their experience of purchasing and using sericin soap, ii) their availability and willingness to take part in the study, and iii) how convenient it would be to interview them.

In addition, to gain insights into the potential for sericin soap consumption outside of Thailand, eight international participants were selected and interviewed in Nottingham, United Kingdom. These participants had not consumed sericin soap previously (and were therefore a non-consumer group), although some were aware of what sericin soap was.

9.1 Socio-Economic Backgrounds of Sericin Soap Consumers

The consumers involved in this study who lived in Thailand, either lived in the same villages as soapmakers and traders, or in nearby districts. They typically bought sericin soaps at the producers' or traders' houses/production sites or made telephone orders and had soap delivered to their homes. Most of those involved in the study were women aged 46 ± 15 years old whose highest level of education was primary school (Table 9.1). Six of the women were farmers, one a chef, and another a government official. The female participants owned larger farms and grew a wider variety of crops, and as a result had more disposable income available to them than the men in the study.

The men involved in this part of the study had similar ages to the women (46 ± 18 years old) but had more diverse educational backgrounds. All attended primary school, but some had studied up to higher vocational certificate level. Two of the men were farmers and one was a government official.

Table 9.1 Socio-economic backgrounds of sericin soap consumers in Thailand (£1=THB50)

Socio-Economic Backgrounds of Thai Soap Consumers						
Gender		Age [min,max]	Marital Status	Education Level	Yearly Income (Baht) [min, max]	Occupation
Female	8	46±15 [21, 60]	-7 Married -1 Single	-1 No formal education -6 Primary school -1 High vocational certificate	236,900±320,950 [0, 1,000,000]	-6 Farmers -1 Chef -1 Government officer
Male	3	46±18 [26, 59]	-2 married -1 Single	-1 Primary school -1 Vocational certificate -1 High vocational certificate	152,500±134,250 [37,500, 300,000]	-2 Farmers -1 Government officer
Total	11	46±15 [21, 60]	-9 Married -2 Single	-1 No formal education -7 Primary school -1 Vocational certificate -2 High vocational certificate	213,850±278,000 [0, 1,000,000]	-8 Farmers -1 Cook -2 Government officers

Samai, a 60-year-old female farmer and silk weaver from the Chumtabong community became a sericin soap consumer after receiving some free samples of the product. She suggested:

"When I went to the sericulture community leader's house to get silk yarns, I saw them making sericin soap. She gave me some [soap bars] to try. After using it for a while I began to like it, so now I buy it."

It is clear that these study participants valued the local nature of the product and were often familiar with how it is produced. Prakarn, a 54-year-old male farmer from the Huaysai community suggested:

"I regularly use sericin soap. I've seen them producing it, so I know how it's made, but I don't sell it myself. I use it regularly, partly because it's my community that produces it, but also because I like it. I have never used [sericin soap] produced by other communities."

Thanan, a 26-year old male official at Huaysai Sub-District Administrative Organisation added:

"I have been using sericin soap for a year now. Naree comes to deliver it to my office. I work at the [Huaysai] Sub-District Administrative Organisation and, because it is related to the work of the Community Development

Department, the majority of us there know about sericin soap. My colleagues told me about the products locals produce when I first started work. People who bought the soap told me that it was a good product."

From these comments, it is clear that these participants had a sense of place and community associated with their purchase and consumption of sericin soap. This might be because they lived where the soap is produced and had first-hand experience of how it helps to enhance the livelihoods of those in the area. In addition, it might be because being local, it was convenient to purchase, and knowing the producers and community enterprise traders, they trusted the people they were buying from. Trust is a factor which allows successful transaction in trade (Kwon and Suh, 2004; Jacinto and Pomeroy, 2011).

9.2 Socio-Economic Backgrounds of Non-Consumers of Sericin Soap

To understand the broader, international appeal of sericin soap, the research included students from the University of Nottingham in the United Kingdom. The students, four Thais, one Indian, one Chinese, and two Britons, were given in-depth, face-to-face interviews. The results of these interviews had the added advantage of providing insights into how students from the same university and environment differed in terms of their consumption behaviours and opinions in relation to sericin soap consumption. Being younger and with higher incomes and better education, this 'international' group differed considerably from the others involved in the research (Table 9.2).

To determine their response to the soap, the students received samples produced by each of the sericulture community enterprises involved in sericin soap production in Thailand. None of them had previously used sericin soap, while two of the four Thai students had seen it at OTOP exhibitions and trade fairs in Thailand.

Prapawan, a 43-year-old female Thai nursing student suggested:

"I have heard about sericin soap, but never tried it. It's quite hard to buy as it's not generally sold in shops. I want to try these samples because I have heard that this type of soap contains natural ingredients. I have also heard that products made from silk cocoons are good for the skin."

Table 9.2 Socio-economic backgrounds of non-consumers of sericin soap in the UK

Socio-Economic Backgrounds of Non-Consumers of Sericin Soap in the UK							
Gender		Age (years) [min,max]	Marital Status	Nationality	Education Level	Yearly Income (pounds) [min,max]	Job
Female	4	32±10 [20, 43]	All single	-3 Thais -1 Indian	-1 Bachelor -3 PhD	8,563±4,033 [4,250, 12,000]	All students
Male	4	30±3 [27,33]	-3 Single -1 Married	-1 Thai -1 Chinese -2 British	-4 PhD	9,525±6,438 [0, 14,000]	All students
Total	8	31±7 [20,43]	-7 Single -1 Married	-4 Thais -1 Indian -1 Chinese -2 British	-1 Bachelor -7 PhD	9,044±5,000 [0, 14,000]	8 Students

The suitability of the soap for various skin types and its general safety were clearly important to a number of those involved in the study, regardless of their backgrounds.

Prapawan said:

"I have had silk soap and lotion testers from OTOP fairs in Bangkok, but I didn't dare to use them. I am worried that I may be allergic to them because I have never used them before … It's not their standards or quality that I am concerned about. It's more an issue of allergy. Some natural products are not suitable for my skin."

Wilaiwan, a 38-year-old female Thai Oncology student maintained:

"I have never heard of sericin soap before. Normally I won't try a product that I have never heard of or used before because I don't know whether it will cause me problems or not. As I know the products I do use don't cause me problems, I generally don't try new products."

Patty, a 28-year-old Indian Geography student added:

"I am used to using herbal and natural products. But you don't get these kinds of product easily, or they are very expensive, especially in the UK. I do though normally go for herbal products. I use products from The Body Shop because they contain natural ingredients. I use natural cosmetics because my skin is very sensitive."

9.3 Following Soap Consumption

Soapmakers and community enterprise traders suggest that most consumers who purchase sericin soap bars and liquids are Thai. This is almost certainly because those who shop in the areas they do business in are Thai and the packaging and promotion of these products is largely done in the Thai language. As far as the samples used in this research were concerned, only the packaging and labelling of soap from the Chumtabong community enterprise was printed in both Thai and English, with both languages used to describe the product, its ingredients, and to provide details of where it was manufactured, and to give expiry dates in order to follow the regulations set by the Food and Drug Administration (FDA) of Thailand (FDA, 2011). By contrast, while it provided the same information (but with less description and detail), information on the packaging and labelling of sericin soap produced in Huaysai and Nayaw-NaUdom was only in Thai.

The results of the study show that not all soapmakers and community enterprise traders questioned could speak English or other non-Thai languages. As such, language barriers between sellers and foreign consumers are an obvious issue. In addition, in Thailand, sericin soap is mainly sold in government fairs by community enterprise traders and the government agencies that support them. This limits the product's exposure in international markets. But this does not mean that the geography of consumption of soap is necessarily only confined to Thailand. Consumers' lifestyles also determine how the soap travels from one place to another (Peterson, 2018).

As touched on previously, study participants generally bought soap at sericulture community enterprise booths at Thai government fairs (Fig 9.1), soapmakers' houses or ordered it from sericulture community enterprise sellers (normally their enterprise presidents) via phone or apps like Line and Facebook messenger. Those purchasing soap in person at sericulture communities were more likely to know the soapmakers and traders personally. Because they had visited production sites, they often had a good understanding of how sericin soap is produced. In addition, with high levels of trust between themselves and the sellers, they often made repeat purchases (Kwon & Suh, 2004; Jacinto & Pomeroy, 2011). This aligns with the thinking of Fletcher (2006) who notes identity is not simply expressed

through the consumption process, but through cultural connection with the people that consumers choose to associate with. As a result, consumers choose to buy soap from people and locations that enhance cultural connection.



Figure 9.1 Thai consumers purchasing silk fabrics and sericin soaps and lotions produced by Nayaw-NaUdom enterprise at a local government fair in Buriram province.

The study suggests that those participants who were local consumers normally purchased soap produced by their own communities. This was not only because they liked or trusted the quality of the products, but it was also a way to show support for local products. Some Thai participants originally went to government fairs to purchase handmade silk fabrics, but ultimately purchased yellow sericin soap because it was placed next to other silk products (Fig. 9.2). In comparison to silk fabrics, silk by-products like sericin soap are considerably less expensive, and this offers several retailing opportunities.

This research therefore argues that as a commodity, soap - and particularly sericin soap - has both cultural and symbolic characteristics underpinned by how it is sold in certain environments, who sells it, and through branding and packaging. This research contributes to literature by highlighting the social and economic links between sericin soapmakers, traders, and consumers in a variety of geographical locations and through its consumption.



Figure 9.2 Thai consumers browsing silk fabrics and sericin-based cosmetics produced by Chumtabong enterprise in front of Fahsai Gallery store in the government complex building in Bangkok.

Many participants suggested that, in addition to reading labels and the information on packaging, they relied on input from soap sellers and previous users when making a purchase. This might be partially due to inadequate information available on the labelling but could also be just a matter of trying to make a more informed decision.

The study shows that community enterprise sellers' sales approaches influence the geography of consumption and shape market responses and consumer demands. For instance, Chumtabong enterprise sellers promoted the differences in the properties of their sericin soap liquids and bars and highlighted their different purposes. They encouraged consumers to wash their faces with liquid soap to show how much gentler and more nourishing it was on the skin compared to soap bars. Soap bars, they suggested, should only be used on the body. However, Huaysai and Nayaw-NaUdom community enterprise sellers recommended that because they provided the same cleansing and nourishing effects, sericin soap bars and liquids should be used to wash both the face and the body.

Participants gave examples of how they reflected on the different aspects of each soap product before making a purchase:

"I generally prefer soap products that do not have a really strong smell. Soap should smell mild and natural. This sericin soap smells nice. [Sericin soap] has a very gentle smell. It has got a nice colour as well. However, when I choose soap, I don't exactly choose it based on colour. When I moved to the UK my skin started getting overly sensitive and it is getting drier every day, so aside from being natural with a less strong fragrance, I prefer soap that hydrates my skin", said Patty.

"The colour of soap does impact my decision whether I buy it or not. Let's say this [sericin soap] is promoted as being a 'honey soap'. If its white and not honey-coloured I won't buy it. The colour of soap should correspond to its ingredients. In addition, a soap's ingredients should influence its fragrance. I have my own expectations about how this type of soap should smell." Apichart, a 28-year-old male student in Pharmacy.

Findings from interviews show that consumers in this study purchase soap because of *soap functions, soap quality, soap colour, its scent, packaging, branding, the characteristics of where it is sold, price and promotion, customer reviews, product referrals, stock availability, convenience of purchase, product storytelling, and the personal relationship between consumers and producers/traders.* Marketing and business literature relating to soap highlights the same issues as being common to soap consumers (Bbenkele, 1986; Punpanishgul, 2002; Patwardhan, Flora and Gupta, 2010; Adithya, 2011; Sarma and Pratap, 2011; Mahalingam and Kumar, 2012; Thanisorn, Byaporn and Chanchai, 2012; Vasantha, Varatharaj and Shalini, 2013; Hemalatha, Antony and Sivanesan, 2014; Katiyar and Katiyar, 2014; Shanmugapriya and Sethuraman, 2014).

This study fills a gap in the literature by establishing that storytelling – providing information about how sericin soap is produced and the communities that produce it – positively impacts consumer purchase behaviours and engagement. Storytelling gives a brand a persona and adds value to the commodity, giving consumers an image of the product. It arouses a symbolic position (Mora and Livat, 2013) and stimulates emotions that influence consumers' perception of a brand (Barsky and Nash, 2002; Morrison and Crane, 2007; Herskovitz and Crystal, 2010; Hammond, 2011; Hwang and Kandampully, 2012). This in turn enhances brand loyalty which helps producers generate increased revenues. Storytelling does though have

to be done appropriately with relevant information or it may have a negative impact consumers (Gilliam and Flaherty, 2015).

Lila, a 20-year-old Thai economic student in the UK suggested:

"If I hear their story, how they have grown from scratch to make this soap, then I will be interested in trying their product. …Yeah, the story is important because this is how products are sold. They have a story behind them. 'Oh, we are from this valley and this valley has natural resources, so we want to specialise in soaps, blah blah blah. That's why we started this and it has helped the community'. Beyond this, if a soap genuinely helps a community in terms of giving people an income and improving their standards of living, then it's a good thing. I would try this product out because of the story behind it. It's a positive thing, but I don't really see these sorts of products in the supermarket."

This research shows that the consumers interviewed in this part of the study were influenced by their own experience, their knowledge, and any information available to them. This in turn shaped their views on the quality of the soap (Balasubramanian, Raghunathan and Mahajan, 2005; Coulter *et al.*, 2005).

Prapawan commented:

"I use different soaps for my body and face. Soaps with a fragrance I use on my body. But I prefer to use soap without fragrance on my face… Because I don't know whether I am allergic to the soap's perfume formula or ingredients. There was this one time when I tried some soap with perfume in it and I found I was allergic to it. So, my criteria for determining the quality of soap for my face and for my body are different.

If it's for my face, soap and cosmetics should nourish my skin, and not make it dry. However, if it's for my body, it's fine if the soap makes my skin dry because I only use it for washing my body. Although I use both for washing and keeping clean, when it's for my face, I want it to clean and nourish my skin. ... It is important for soap to contain natural ingredients instead of synthetic ingredients because that makes it suitable for sensitive skin. I only use soap that contains synthetic ingredients on my body, not on my face."

Worakarn, a 30-year-old female official who used soap produced by Huaysai enterprise explained:

"When I buy body wash, I don't really check its properties much. However, if I buy cleansing foams for my face, I check the details carefully. I like natural products, and I see that this sericin soap also contains turmeric and honey. I like its smell, too. But the colour of the soap is not important to me."

In contrast, Apichart commented:

"When buying cosmetics, I look at the information on the packaging. I check whether the description is reasonable or not based on the ingredients. For instance, if it contains tamarind extract, it should nourish the skin. But if it states that it has anti-oxidants, I won't buy it, because I know that 0.001% of tamarind extract in a skincare product won't make that much difference. I don't believe in advertising that makes false claims about what a product does."

After examining the soap package, he said:

"We can't know how they produce this soap, but we can know the source of the important ingredients. As far as this (sericin) soap is concerned, it contains silk protein, but that doesn't make me want to buy it, because the packaging doesn't tell me what sericin is used for. Foreign soaps highlight active ingredients and provide a description of the soap's effects. For example, 'research shows that 70% of users show positive results after using this soap'. This will make me want to buy it."

8 out of 12 of the women in the study (67%) and 2 out of 5 men (40%) applied different criteria when using soap on the body and on the face. When using a facial wash, they paid more attention to product information, ingredients and its quality as they wanted a product that would clean and nourish their skin while addressing their skin issues. In addition, they wanted to avoid potential allergic affects.

By contrast, when using soap to wash their bodies or their hands, the consumers in the study only wanted soap with a pleasant scent. In this

situation, they paid more attention to the soap's price and the type of fragrance. As olfactory cues are known to impact consumer behaviour (Spangenberg, Crowley and Henderson, 1996; Haberland, 2009; Parsons, 2009), scent can be a critical factor in soap purchases. The extent to which consumers associate the smell of a soap and their own identities has yet to be properly studied (Corbett, 2006).

Certain factors do though influence consumers' decision-making behaviours more than others (Adithya, 2011; Mahalingam and Kumar, 2012; Hedlund and Mattero, 2018). This might be due to their different personalities and lifestyles, which in turn are influenced by issues like gender, and social, economic, and cultural backgrounds (Bbenkele, 1986; Willis, 1990; Leslie and Reimer, 1999; Spangenberg and Lorek, 2002; Curran and de Sherbinin, 2004; Soares, 2004; Mansvelt, 2010; Sarma and Pratap, 2011).

The responses of those involved in this study indicate that ease of purchase and the experience when making a purchase influenced whether they would buy and use a particular brand of soap, as did their experience of the store it was purchased from (Balasubramanian, Raghunathan and Mahajan, 2005; Kahn, Inman and Verhoef, 2018).

Wilaiwan commented:

"*I normally shop in shopping malls because it's convenient. Besides, most popular brands are sold in shopping malls. I don't normally buy things online. So, if sericin soap were not sold in shopping malls, I wouldn't buy it. I would buy it only if I it was easy to find. Buying body wash is not that serious an issue for me. I don't have to find a new product - I can continue using my regular brand.*"

Similarly, Prapawan said:

"*It's easier to buy brand name skincare products because they are sold widely, but OTOP products or products from community enterprises are not readily available. The only way to get them is to contact community shops or sellers directly. I think the reason people don't buy these sorts of products is they are hard to find. Consumers will look at the quality of a product first and buy it of they like it, but they won't if they don't know where to buy it.*

I used to buy a facial toner which I thought was nice. But when I finished it, I couldn't find where to buy it again. I knew that the group was in Ubon Ratchani province, but I couldn't remember exactly where, so I had to stop using it."

Interview findings suggest that consumers did not choose to purchase sericin soap because of *issues of product quality, lack of trust, unsuitable language and message used on labelling, and inconvenience of purchase* (Selnes, 1993; Kwon and Suh, 2004; Ali *et al.*, 2018; Hedlund and Mattero, 2018; Salem, 2018). Rather, they preferred using soap they were familiar with or which they could buy easily or locally (or on Internet). Purchase methods also depended on lifestyles and preferences (Peterson, 2018).

This research further argues that both soap consumption and non-consumption behaviours reflect consumers' subjectivity, and this is influenced by issues like their lifestyles, their identities and status, and their sense of self. These issues are underpinned by culture, which people use as a framework for living and to make sense of their lives (Willis, 1990).

This research agrees with Spangenberg & Lorek (2002) who show that consumer behaviours depend on both intrinsic and extrinsic factors. This research is also in accordance with other studies which demonstrate that intrinsic factors (such as age, gender, race, socio-economic status, lifestyles, education level, and attitude) shape consumers' preferences (Spangenberg & Lorek, 2002; Curran & de Sherbinin, 2004; Mansvelt, 2010). Consumers' disposable incomes also affect how they justify commodity values (Spangenberg & Lorek, 2002; Curran & de Sherbinin, 2004) and this is reflected in this study as they described soap differently as being either *general or luxury goods.* McRobbie (1997) and Jackson (1993) indicate that purchasing power and income are important factors in creating social differences as they affect consumers' tastes and preferences, influence which stores they choose, and the commodities they want. As a result, different purchasing power and uneven distribution of access mean people have different experiences when purchasing sericin soap (Mansvelt 2014). However, how consumers view soap also depends on how their cultures influences their perception of certain things too (Willis, 1990). So, some foreign consumers in the study view sericin soaps as being *exotic goods*.

Some of the Thai farmers and silk weavers in the study viewed sericin soap as *luxury goods.* They only used it to wash their faces because they considered it to be more expensive than synthetic soap. However, the other Thais and the Chinese participant regarded it as *general soap*. They expressed that they would use it on any part of their bodies which was suitable for their skin conditions and fit to their lifestyles. Whereas, the Indian and British students in the study viewed sericin soap as *exotic goods* because they had never seen it before. They preferred the soap bars from the Huaysai and Nayaw-NaUdom community enterprises, which were placed in attractive silk and cotton bags (Fig. 9.3). This is consistent with studies which show that the visual and verbal attributes of packaging influence consumers' purchasing decisions (Ampuero and Vila, 2006; Clement, 2007; Silayoi and Speece, 2007; Salem, 2018; Yu *et al.*, 2018). Foreign consumers in the study considered sericin soap suitable for gifts because those receiving it as a gift would appreciate its association with the Thai identity and Thai culture. This finding supports Wall et al.'s (1991) study which shows that, to some extent, where soap is made affects consumers' purchasing decisions. Hence, this research contributes to literature by presenting that soap commodity has different values and meanings for people who are influenced by their own cultures which are associated with their origins.



Figure 9.3 The arrangement of the soap least preferred by British males to most preferred (from left to right).

Andy, a 30-year-old British male Geography student, responded:

"When you think of cosmetics, for me certainly I definitely think of somewhere like Thailand or Asia as being of area of the world where the cosmetic manufacturers are associated with the area. So, if you tell me that one of these products is British made, I would probably go for another that is made in Thailand. I feel like that the [cosmetic] industry [in Thailand or Asia] is more associated with the product image than [the one in the UK]."

He added:

"When you think of the UK, I only think of basic soap. But [sericin soap] sounds more exotic, more exciting. If I'm getting presents for my friends and it is British soap, they would be like 'so what?' But if I said that the soap was made in Thailand or Vietnam or the Philippines, they would be more interested."

Two of the British men in the study chose the soap from the Huaysai and Nayaw-NaUdom community enterprises. While the Huaysai soap packaging/labelling was only in Thai, the Chumtabong soap offered English descriptions and a Bio-Economy logo. The two men argued that the Chumtabong soap packaging made it look like a cigarette box, and this deterred them from choosing it. On the other hand, when the Thai and Chinese participants in the UK were asked about the soap and its packaging, they all preferred the Chumtabong soap because the information it provided and the packaging style made it look more professional and credible. The similarities and differences in the participants' preferences are partly underlined by their different cultures (Willis, 1990). These findings support other studies that show that, to some extent, packaging styles and information on packages affect consumers' purchasing decisions (Silayoi and Speece, 2004; Deliya and Parmar, 2012; Jamal, Khan and Tsesmetzi, 2012; Shekhar and Raveendran, 2013). Consumers' soap packaging preferences are linked to the sign value of the commodity, which reflects their identities (Chatterjee, 2007).

Chou, a 27-year-old Chinese student who studied geography, commented:

"I won't buy something I can't understand. If Thai soap is sold in China, they should have Chinese text on it. I don't think many people would buy

something when they don't understand what it is because maybe it isn't suitable for the them."

This research contributes to literature by presenting that the value of the soap commodity is created through its consumption by fulfilling people's needs and pleasure in the beauty and toiletry industries, regardless of their gender, ethnicity, and socio-economic backgrounds. Accordingly, this research argues that soap is a *genderless commodity* which everyone uses in their everyday lives in various forms and for a variety of purposes. Likewise, this research fills the gap in the literature by demonstrating that the geography of sericin soap consumption is shaped by consumers' lifestyles and preferences, their cultures, and the capacities of sericulture community enterprises, traders, and producers.

9.4 Impacts of Soap Consumption

As previously mentioned, packaging was one of the factors that influenced consumers' choice of a particular soap in the study. In addition to packaging, other factors like product and service quality, brand name and reputation, price, promotion, and store environment also influence the level of cosmetics brand loyalty (Selnes, 1993; Khraim, 2011; Hemalatha, Antony and Sivanesan, 2014). Due to the purchasing power of consumers, community enterprises attempted to make their soap appeal to their target groups in order to increase their sales. Tables 9.3, 9.4 and 9.5 present the types and costs of packaging of the soap produced by Huaysai, Nayaw-NaUdom, and Chumtabong enterprises. Two government agencies (BEDO and CT) assisted them in developing their packaging designs and labelling.

As expected, community enterprises that were more able to satisfy consumers' preferences of soap were more likely to see a higher demand for their products and gained greater competitive advantage. Chumtabong enterprise, which had large orders of soap, could reduce costs by ordering high volumes of packaging and engaging delivery services. They ordered at least 10,000 soap bar boxes from a manufacturer in Nakhon Sawan province, and at least 5,000 recyclable plastic bottles and plastic pump dispensers from manufacturers in Bangkok each time. However, Huaysai and Nayaw-NaUdom enterprises experienced lower consumer demand (c.1,000), and as a result the presidents of these organisations had to purchase soap packaging and labelling at various shops in the central districts of their

provinces. As they did not own cars, they needed to hire a car and a driver, or take a train to make the trips, and this of course incurred additional costs. In Nayaw-NaUdom hiring a car and a driver costs 1,000 baht for a return trip, while the bus costs 300 baht and the train 150 baht. Given the amount of packaging and labelling they were transporting, public transport proved inconvenient. Because they were ordering only low numbers of each item, the retail shops they bought them from were unable to provide a delivery service. High packaging costs had a negative impact on the capital costs of the soap these two enterprises produced, and this lowered their profit margins.

Table 9.3 Types and costs of packaging of soap produced by Huaysai enterprise

Type of soap (Capital cost)	Packaging used	Packaging Cost (baht/soap)	Packaging cost/Capital cost
A 60g soap bar (THB16/bar) (without box)	Plastic wrap	0.35	2.19%
	Paper sticker (label)	1.00	6.25%
	Total	1.35	8.44%
A 60g soap bar (THB19/bar) (with box – optional)	Plastic wrap	0.35	1.84%
	Paper box (min. order ~1,000 boxes)	3.00	15.79%
	Total	3.35	17.63%
A 240ml soap liquid (THB53/bottle)	Plastic Bottle including its plastic cap (min. order ~100 bottles)	23.00	43.40%

Table 9.4 Types and costs of packaging of soap produced by Nayaw-NaUdom enterprise

Type of soap (Capital cost)	Packaging used	Packaging Cost (baht/soap)	Packaging cost/Capital cost
A 30g soap bar (THB13.5/bar)	Plastic wrap (min. order~100 pieces)	0.05	0.37%
	Paper sticker (label)	0.80	5.93%
	Total	0.85	6.30%
A 60g soap bar (THB27/bar)	Plastic wrap (min. order~100 pieces)	0.05	0.19%
	Paper sticker (label)	0.80	2.96%
	Total	0.85	3.15%
A 100g soap bar (THB45/bar)	Plastic wrap (min. order~100 pieces)	0.05	0.11%
	Paper sticker (label)	0.80	1.78%
	Total	0.85	1.89%

Table 9.5 Types and costs of packaging of soap produced by Chumtabong enterprise

Type of soap (Capital cost)	Packaging used	Packaging cost (baht/soap)	Packaging cost/Capital cost
A 50g soap bar (THB24/bar)	Paper sticker (print themselves)	0.40	1.67%
	Compostable plastic wrap	0.10	0.42%
	Total	0.50	2.08%
An 80g soap bar (THB34/bar)	Compostable paper box (min. order ~ 10,000 boxes)	2.70	7.94%
	Compostable plastic wrap	0.10	0.29%
	Total	2.80	8.24%
A 120ml soap liquid (THB55/bottle)	Recyclable plastic bottle (min. order~ 5,000 pieces)	8.00	14.54%
	Plastic pump dispenser (min. order ~ 5,000 pieces)	5.00	9.09%
	Total	13.00	23.64%
A 240ml soap liquid (THB55/bottle)	Recyclable plastic bottle (min. order~ 5,000 pieces)	8.00	14.54%
	Plastic pump dispenser (min. order ~ 5,000 pieces)	5.00	9.09%
	Total	13.00	23.64%

As presented in Tables 9.3-9.5, the materials used in soap packaging were paper and plastic. However, the soapmakers or leaders of community enterprises who bought them had no information about chemical compositions of these materials and whether these materials were biodegradable or not, nor did they understand their impact on the environment. The soapmakers from Chumtabong enterprise claimed that their packaging was compostable and recyclable, but they had no evidence to substantiate these claims. Partly, this may be because the Thailand Cosmetic Act C.E. 2015 requires a description of a cosmetic's ingredients, but does not command details regarding chemical compositions of labelling or packaging used in cosmetics (The Royal Thai Government, 2015). Only the aesthetic appeal of the packaging and labelling was of any real importance to the producers, as this is one of the factors consumers consider when purchasing their soap.

This research agrees with studies that suggest the discharging of soap effluents and packaging waste has an impact on the environment (Holdway, Walker and Hilton, 2002; Francke and Castro, 2013; Mustafa and Ahmed, 2014). The degree to which soap effluents and packaging impact the

environment depends on their chemical compositions, their amounts, and how they are processed prior to disposal (Holdway, Walker and Hilton, 2002; Wiel-Shafran *et al.*, 2006; Gross *et al.*, 2008; Eriksson *et al.*, 2009; Misra, Patel and Baxi, 2010; Dhanirama, Gronow and Voulvoulis, 2012; Mohamed *et al.*, 2013). Likewise, based on findings from interviews and observations, this research concurs with Van Lieshout *et al.* (2015) who argue that the distinct production and consumption patterns associated with different kinds of soap have different impacts on the environment. Accordingly, this study contributes to the literature by highlighting the environmentality dimension of geography of consumption.

The absence of ethical labelling meant that even when consumers were concerned about socioenvironmental impacts of soap, they would not be able to make an informed decision about whether to purchase it or not. This thus leads to environmental impacts at the consumption end of the chain without consumers fully understanding of their potential impacts on the environment before purchasing. This is an area overlooked by both soapmakers and the government agencies that supervise these enterprises. Correspondingly, this reflects the inadequacy of Thai regulations relating to cosmetics in terms of enforcing cosmetic manufacturers to complete a transparent and comprehensive assessment of the social and environmental impacts of the cosmetic value chain before retailing them.

Findings from interviews show that consumers' lack of understanding of how their consumption behaviours and product choices impact the environment is a cause for concern. This study substantiates the literature which presents that consumers appear generally unaware of such issues, regardless of their gender, education, ethnicity, culture, and socio-economic background (Johri and Sahasakmontri, 1998; Auger *et al.*, 2003; Belk, Devinney and Eckhardt, 2005). In this study, there was an absence of information regarding the socio-environmental impacts of sericin soap at any point in the soap value chain. The study also showed that ethical issues were not generally considered when making a purchase decision. This might be because such issues do not engage consumers personally and they do not prioritise how the environment is affected by their choices. This stops consumers from having an emotional connection with these issues and stops them being able to change their consumption behaviour (Eckhardt, Belk and Devinney, 2010). Although recent concerns about plastic pollution may be changing the

global mindset, generally, there is an attitude-behaviour gap, and ethical disposition has little association with ethical decision-making (Roberts, 1996; Auger *et al.*, 2003; Vermeir and Verbeke, 2006).

The interviews in this study show that some participants considered the ethical features of soap, but they generally made a purchase based on issues like brand, physical appearance, quality, and cost. The enterprises did not address the ethical issues of soap production in their marketing, probably because ethical labelling is not required by Thai cosmetics regulations (The Royal Thai Government, 2015). Therefore, the social, geographical, and environmental contexts that constitute commodity production are covered by market exchange and marketing activities (Marx, 1976; Baudrillard, 1988; Goss, 2005). As a product's ethical features were not really a concern of most of the consumers in this study, this research argues that lack of consumer motivation encourages enterprises not to share this type of information with the public.

Worakarn, a female Thai soap consumer, suggested:

"I don't think making sericin soap causes environmental issues because locals have been producing silk for a very long time. However, when buying soap, I don't consider the environmental issues related to its production. I just think about whether I want to use it. If it provides good results, then that's good. How it is produced is a different matter."

Andy, a British male, responded:

"I don't think I give [ethical and environmentally-friendly brands] a lot of thought. For example, The Body Shop has an image of being environmentally and socially responsible, so if I plan to buy cosmetics, especially for other people, that is likely to be one shop that I probably go to first or second. It has a good reputation, but it's more the shop's overall reputation rather than the reputation of the individual products. So, I don't look at soap and wonder how it's made. But I just think that this soap is sold at The Body Shop and The Body Shop has a good reputation, so this soap probably has a good reputation, too."

He further commented:

"I think it will be hard for me to compare which [soap] producers have the best working practices. That's pretty hard to tell from the limited information you get in the shop. Maybe if you went online, googled the brand and where a product is from, then maybe you can find out more about it. But when you are in the store, it's difficult to find out - even if you want to know what their working conditions are like or how much people are paid. That information is not readily available in the store, so it's hard to consider, even if you are concerned about it. You don't have the information to make an informed decision."

This study provides results that contrast with the research of Auger *et al.* (2003) and Davies *et al.* (2012) by arguing that the nature of a product, its status, and price are not in themselves sufficient indicators to evaluate the extent to which consumers value the ethical features of a commodity. This is because soap can be viewed as either a general or luxury goods based on consumers' cultures, norms, and socioeconomic backgrounds.

This research complements studies which show that most consumers prioritise product performance over the ethical features of a product (Roberts, 1996; Auger *et al.*, 2003; Belk, Devinney and Eckhardt, 2005). Auger *et al.* (2003) and Carrigan & Attalla (2001) note that specific ethical product features affect certain types of individuals but not others. This might be because what one individual (or even culture) considers ethical might be different to that of another (Carrigan and Attalla, 2001; Belk, Devinney and Eckhardt, 2005; Kauppinen and Spronk, 2014).

Although as far as this study was concerned ethical decision-making was not an obvious influence on soap consumers' purchasing behaviours, other findings show that consumers might alter their purchasing patterns when a company's marketing provides them with information relevant to the ethical issues they are concerned about. This is similar to the experience of The Body Shop and Burt's Bee cosmetic brands (Auger *et al.*, 2003; Todd, 2004). Creyer (1997) argues that consumers who care about a company's ethics will adjust their purchasing behaviours accordingly. Findings from interviews show that most consumers tended not to actively acquire information about ethical issues, but were instead given information by an acquaintance or stimulated by items in the press or online. Hence, this research argues that

the negligence of community enterprises to communicate their ethical practices in soap production leads to consumers' ignorance in taking ethical issues into account when purchasing soap.

9.5 Summary

The *Follow the Thing* approach was used to determine the identities, social status, and lifestyles of soap consumers in Thailand and international students in the UK – a *non-consumer group* neglected in literature despite their potential impact on the value chain (Cook 2004; Cook & Harrison 2007; Ugoh 2017; Yeh & Lama 2013). This study fills the gap in the literature by examining the geographies of consumption of soap at both domestic and international levels. The similarities and differences of consumers' purchasing behaviours in specific geographies have been explored. Their preferences reflect consumers' subjectivities which indicate their lifestyles, identities, status, and sense of self (Bourdieu, 1984; McCracken, 1988; Warde, 1992; Goss, 2005; Mansvelt, 2014; Peterson, 2018). This is underpinned by consumer culture, which people use as a framework for living and making sense of their lives (Willis, 1990). This research argues that consumers' identities can be determined through their purchasing power, soap preferences (Jackson, 1993; McRobbie, 1997; Crane, 2000; Corbett, 2006; Chatterjee, 2007; Badaoui *et al.*, 2018), and how they choose to buy soap from certain people and for others (Fletcher, 2006).

This research fills the gap in the literature by demonstrating that soap consumption connects people, places, and things together through the dimensions of spatialities, socialities, subjectivities, and environmentalities. Likewise, the study contributes to broader literature by demonstrating that the geography of soap consumption is shaped by consumers' lifestyles and preferences, consumer cultures, and the capacities of sericulture community enterprises, traders and producers.

Consumers purchase soap because of *soap functions, soap quality, soap colour, its scent, packaging, branding, the characteristics of where it is sold, price and promotion, customer reviews, product referrals, stock availability, convenience of purchase, product storytelling, and the personal relationship between consumers and producers/traders.* Factors which make consumers choose not to purchase sericin soap include *issues of product quality, lack of trust, unsuitable language and message used in labelling and inconvenience*

of purchase. As people have their own preferences and purchasing criteria, this research argues that some factors affect consumer purchase behaviours more than others, indicating their subjectivities.

Consumer demands affect soapmakers' profit margins and the lifestyles of soapmakers and community enterprise traders. The ethical dimension of soap consumption with respect to labour conditions and environmental impacts have apparently been neglected by the Thai government, community enterprises, and consumers. Consumers interviewed appear to prioritise product performance over ethical features (Belk et al., 2005; Auger et al., 2003). This might be because they buy things to serve their needs, not to justify their moral attitudes. In addition, this research has demonstrated that soap brands fail to provide relevant ethical information and this prevents consumers from making informed decisions.

Consumers' consumption behaviours shape how each kind of soap has different socioenvironmental impacts, and these are often a result of how soap and its packaging is procured, used, transported, and disposed. The degree to which soap effluents and packaging impact the environment depends on their chemical composition, the amount of packaging, the amount of waste discharge, and how they are treated before being released (Holdway, Walker and Hilton, 2002; Wiel-Shafran *et al.*, 2006; Gross *et al.*, 2008; Eriksson *et al.*, 2009; Misra, Patel and Baxi, 2010; Dhanirama, Gronow and Voulvoulis, 2012; Mohamed *et al.*, 2013). By using the *Follow the Thing* approach, this study has shown that lack of information regarding types of packaging and ethical labelling reflects the negligence of government agencies to oversee environmental impacts of the soap value chain and the inadequacy of Thailand's cosmetic regulations which do not enforce cosmetic manufacturers to carry out a transparent and comprehensive assessment of the social and environmental impacts of the cosmetic value chain before retailing them. Consequently, this leads to unexpected environmental impacts at the consumer end due to their consumption and disposal of soap and its packaging; this influences the dynamics of the soap value chain to be less responsible towards society and the environment.

CHAPTER 10-CONCLUSIONS

10.1 Introduction

Thailand is the first country in the world where the government supports sericin soap-making businesses as an extension of silk production. Sericulture communities extract sericin protein from the wastewater produced while degumming silk, and this is used to produce a variety of soap products. Although the government's project has spread to many communities in Thailand, this study is the first to thoroughly investigate the geographies of soap commodity chains, the roles and impacts of chain actors, and the connections between production and consumption.

The soap value chain, which can be viewed as an extension of the silk value chain, has been neglected by previous researchers who have traditionally focused on the more well-established silk textile sector (EU-Thailand Small Projects Facility, 2007; Graham, 2008; Nguyen and Eiligmann, 2010; Vollrath *et al.*, 2013; Patichol, Wongsurawat and Johri, 2014b). As a result, there are few insights available into the socioeconomic impacts of the soap value chain or its environmental impacts (Clinic Technology, 2012a, 2013b, 2013a, 2014; Neal, 2014; BEDO, 2016b). To fill a gap in the literature this study applied the *Follow the Thing* approach (Cook, 2004; Cook & Harrison, 2007) to address the soap value chain's net impact.

The research has specifically considered the soap value chain in Thailand, an upper-middle income country that is rarely investigated in commodity chain analysis. In addition, this research has substantiated the literature by using the *Follow the Thing* approach to demonstrate the gender division of labour and gendered livelihood and development of chain actors. As such, it highlights the largely ignored role of gender in commodity chain analysis.

The *Follow the Thing* approach allowed the researcher to analyse the political economy of commodity chain analysis by investigating the exploitation, dominance and interdependence inherent in the chain. Furthermore, this research has added to existing literature by applying the approach to examining the political ecology of the soap commodity chain, another area traditionally neglected in commodity chain analysis. This was achieved by

addressing the relationship between the commodity chain and the environment, and the chain impact on nature.

This research has also adopted the *Follow the Thing* approach to investigate geographies of consumption and non-consumption of sericin soap. This has helped to understand the similarities and differences between the behaviours, characteristics and identities of sericin soap consumers in Thailand and non-consumers (people who did not consume sericin soap) in the UK. Both groups could influence the geographies and impacts of the soap commodity chain.

This research applied a collective case study methodology in four locations: Huaysai in Nakhon Ratchasima province (Northeast Thailand); Poethong Charoen in Chiang Mai province (North Thailand); Chumtabong in Nakhon Sawan province (Central Thailand); and Nayaw-NaUdom in Buriram province (Northeast Thailand). To achieve the aim and objectives of the study, mixed methods were used in order to obtain consistent and reliable results that were explored from various perspectives while compensating for the weaknesses and benefitting the strengths of each method. Pilot tests, participatory rural appraisal, interviews, observations and questionnaires were used to have a better understanding of roles, relationship, interdependence and socioenvironmental impacts of government agencies, soapmakers, traders, and consumers who were chain actors of soap value chain at different geographies. Consequently, this helped to understand social, economic, cultural, political and environmental underlying aspects of the soap commodity system which led to answer the research question.

The research aim has been *to explicate the complex social and environmental interactions within the commodity chain of soap produced by rural sericulture community enterprises in Thailand.*

Four objectives were formulated to answer the research aim:

Objective 1: To Characterise the Soap Commodity Chain, its Processes, and its Impacts

This research has demonstrated that the soap commodity socially, environmentally and economically links government agencies, soapmakers, traders, and consumers at various geographical locations and times through

the entire chain from production to consumption to disposal. This research has shown that the soap commodity chain is characterised by practices and behaviours of chain actors, the relationships between chain actors, environmental conditions, and government policies. This influences how each soap is produced, packaged, distributed, used, and disposed of, leading to a variety of socioenvironmental impacts. As a result, each soap value chain has its own distinct characteristics, processes and impacts subject to its commodity system; this is shaped by place and space (Leslie and Reimer, 1999).

The soap commodity chain comprises three main parts: the upstream value chain consisting of the Queen Sirikit Department of Sericulture (QSDS), the Thailand Institute of Nuclear Technology (TINT), the Biodiversity-based Economy and Development Organisation (BEDO), Clinic Technology offices (CT), sericulture community enterprises and enterprise members; the midstream value chain consisting of sericulture community enterprises, community enterprise traders, private traders, and government agencies (BEDO and CT); and the downstream value chain consisting of consumers. This research has shown that each actor has their own lifestyle, social status, identity, and environment, all of which influenced them to make certain decisions in the value chain which in return impacts the behaviours of others across the value chain.

This research has revealed the dynamic relationships between chain actors in which none of the actors solely dominates or overpowers the chain. The actions of community enterprises and government agencies alleviate issues of exploitation and dominance while increasing fairness for both soapmakers and traders.

Objective 2: To Identify the Social Status, Identities, and Lifestyles of Chain Actors of the Soap Commodity Chains

This research has revealed the social status, identities, and lifestyles of soapmakers, traders, and consumers. It has also highlighted the policy goals and actions of the four government agencies involved in the study: QSDS, TINT, BEDO, and CT. These organisations adopt people-centred development approaches to assisting rural sericulture communities. They do not work directly with each other but serve the goals of the nationwide Small and Micro Community Enterprise (SMCE) and One Tambon One Product

(OTOP) policies (MOAC, 2005; Natsuda et al., 2012) by tailoring their assistance to community enterprise needs at different points along the soap value chain.

This research has demonstrated the relationships and interdependencies between the organisations in the soap commodity system and shown that each government agency has its own unique role in supporting the business success of rural sericulture community enterprises. The agencies also have symbiotic relationships that help drive them towards their goals.

The research has shown some overlap in the nature of the support the agencies offer community enterprises. This is caused by the specific nature of the outreach activities the agencies are involved in, issues like geographic location, and the agencies' specific areas of expertise. The research also shows that when overlap occurs the organisations do not change their approaches but continue to carry out community development tasks based on their own policies and expertise.

QSDS is the primary supplier of low-cost Thai and Thai-hybrid silkworm eggs and mulberry saplings to farmers. The organisation offers free delivery services to rural communities, and this allows farmers to produce silk at a reduced cost. It also encourages communities to engage in soap production activities. This research has shown that QSDS assumes the roles of *educator* and *market facilitator* by creating an enabling environment in which soapmakers can have a continuous supply of sericin, by enhancing the capacity of farmers to improve their silk production, and by providing free venues where silk and soapmakers sell their products.

This research has demonstrated that to achieve the objectives of its 2013 policy QSDS relied on the outreach activities of other government agencies (TINT, BEDO and CT) to share soapmaking techniques with community enterprises and provide them with the marketing and trading support they required.

CT and BEDO assist rural sericulture communities in the production, marketing and trading of soap. They connect soapmakers with the market and expand soap markets in areas where lack of knowledge, market information, funding and transport options have been obstacles for

soapmakers. These are activities that neither QSDS or TINT are typically involved in. Partly, this is because QSDS promotes Thai silk textiles above ancillary products. Likewise, TINT is a scientific organisation which prioritises research over aspects of commerce.

QSDS depends on the credibility of TINT's research into the areas of sericin extraction methods and the use of sericin in cosmetics (Zhang, 2002; TINT, 2010; Javali *et al.*, 2015). This supports QSDS's policy of encouraging community enterprises to create value-added cosmetic products from sericin (TINT, 2010; QSDS, 2013).

TINT assumes the role of *educator and community developer* in the soap commodity chain by delivering knowledge and soapmaking technology to rural communities. The techniques they promote can be adopted easily and inexpensively, leading to job creation and income enhancement. Once TINT has given each of the community enterprises a foundation in soapmaking, BEDO and CT help to improve and standardise their soap formulas, diversify their cosmetic production line, and market and trade their products.

Sericulture community enterprises are business entities that produce and trade soap through the enterprise distribution channels in order to enhance their negotiation power in the market and minimise exploitation by intermediaries. They assume the role of *community developers.*

This research has defined characteristics of community enterprises based on 1) community enterprise management practices, 2) characteristics of enterprise members, 3) government supports, 4) operational soapmaking styles, 5) obstacles faced by enterprise members, 6) profit sharing schemes that apply to the enterprises, and 7) the contribution enterprises make to their respective communities. This influences their roles and levels of impacts on communities and the environment.

Two categories of community enterprises exist, privately-owned or community-led businesses, depending on how they were formed. Community-led enterprises have instituted transparent profit-sharing schemes set up by their members while private enterprises have profit-sharing schemes that have been initiated by their leaders.

Huaysai and Nayaw-NaUdom enterprises are community-led businesses run as cooperatives, whereas Poethong Charoen and Chumtabong enterprises are private businesses. Other enterprises except Poethong Charoen produce and market silk textiles and soap. Poethong Charoen is the only enterprise that does not produce soap; it commercialises organic mulberry leaves, organic silk cocoons, and compost fertilisers. The reasons of its failure in soapmaking business are due to lack of manpower, poor marketing strategies, inefficient stock management, and lack of support from government agencies. Both Huaysai and Nayaw-NaUdom enterprise members produce soap themselves and rely on community enterprise traders to trade soap on behalf of their enterprises. Whereas, Chumtabong enterprise owners produce and trade soap by themselves and hire their members to assist in soap packaging.

This research has shown that soapmakers' behaviours and lifestyles are influenced by their environments, socioeconomic backgrounds, cultures, interactions with stakeholders, and knowledge and technology available. Enterprise workers are mostly female farmers who produce soap during their free time after farming and producing silk. Soapmaking provides them supplementary income.

This research has identified three types of traders: community enterprise traders, private traders, and Thai government agencies (BEDO and CT). Soapmakers and community enterprise traders have similar lifestyles and identities because they also farm and produce silk and soap. However, they might have different social status due to their different socioeconomic backgrounds which might allow them to own different things and to operate differently from each other.

Typically, community enterprise traders are in leading positions of the enterprises, such as chairperson, president of soap production, or treasurer. One major difference between soapmakers and community enterprise traders is that all community enterprise traders are women whereas there is a mix of men and women in the soapmaker group, with a higher proportion of women, mostly middle-aged to elderly women.

This study has shown that community enterprise traders have managed to overcome transport issues, and that this allows them to secure independent

market power against soapmakers and other intermediaries. Roles of community enterprise traders has been identified as *educators, leaders, trade facilitators, brand ambassadors, gatekeepers, and community developers.*

Private traders are middlemen who are not part of community enterprises. Private traders may have similar or different backgrounds from soapmakers and community enterprise traders. Some are sericulturists from other sericulture community enterprise whereas others are entrepreneurs and shopkeepers approached personally by community enterprise traders. These private traders either sell the original soap brands, which promotes the original producer group, or rebrand them before reselling at premium prices, which conceals their trade routes from soapmakers and community enterprise traders as well hiding soap origins from consumers. Compared to other types of traders, private traders' backgrounds and identities are more obscure than other types due to business privacy issues. This research has identified them as both *facilitators and exploiters*.

BEDO and CT also act as traders. BEDO only assists Chumtabong enterprise to produce and trade sericin soap in Thailand and abroad whereas CT assists more than one sericulture community enterprise (Huaysai and Nayaw-NaUdom enterprises including their networked villages) to produce and commercialise soap in the domestic market. BEDO and CT work independently of each other and focus on different community enterprises, but they share common development goals, which are to alleviate poverty and create jobs based on local resources. As previously mentioned, both organisations are driven by SMCE and OTOP Policies.

In addition, this study identifies that these agencies act as *guarantors of soap quality, educators, facilitators, product and production promoters, and community developers*, as it has become clear that community enterprises' soap production, trading, and marketing are all assisted by these agencies. However, BEDO and CT take different development approaches. CT tends to prioritise the economic outcome over social and environmental impacts, whereas BEDO attempts to balance all aspects when evaluating their community development projects. Furthermore, they also have different partnership strategies and different marketing and profit-sharing schemes with enterprises with which they partner.

This research has demonstrated that soap consumption connects people, place, and things together through the production of spatialities, socialities, subjectivities, and environmentalities. Consumer preferences for soap reflect consumer subjectivities which indicate their lifestyles and cultures, identities, status, and sense of self. In addition, consumer identity can be identified through analysis of purchasing power and soap preferences, and how they choose to buy soap from certain people and for others.

Consumers take the role of triggering profits for midstream and upstream chain actors. This research has revealed that consumer demand strongly affects profit margins of soapmaking and the lifestyles of soapmakers and community enterprise traders.

Objective 3: To Assess Social and Economic Impacts of the Soap Commodity Chains on Sericulture Communities

The socioeconomic impacts of the commodity chain of soap bars and liquids on stakeholders and communities vary according to the characteristics of the individual chains. Since different organisation models favoured by sericulture community enterprises are influenced by characteristics of enterprise workers and local cultures, different community enterprises bring different benefits to enterprise workers in the soapmaking businesses.

This research has shown that soap production contributes to communities in terms of employment opportunities, income generation, and expense reduction. In addition, the production enhances the social safety net of rural sericulture communities through the zero-waste economy. Furthermore, this research has demonstrated that soapmaking preserves tradition, identity, and heritage aligned to silk production while actively empowering women and elderly people, both socially and financially, both inside and outside the home.

Women are empowered by soap production and trading because they take the roles of leaders, producers, and community enterprise traders. Their increased incomes and social status make them more socially and economically independent both in general and specifically from men. Consequently, these practices reform sociocultural and economic gender relations where some women now play dominant roles in supporting their

families and businesses instead of men playing the dominant role, which is more typical in rural communities.

The four government agencies (QSDS, TINT, BEDO, and CT) described empower sericulture communities by providing logistical and financial support and knowledge which improves both human development and economic empowerment, especially for women who have taken control and who have developed autonomy in the upstream and midstream soap value chains. This greatly reduces socioeconomic inequality within and between rural communities, regardless of their socioeconomic backgrounds. These female soapmakers and community enterprise traders are explicitly taking advantage of national SMCE and OTOP policies.

This research has demonstrated that government policies significantly affect the business environment for rural women in Thailand; government agency support can determine the degree to which women succeed in rural businesses. Despite this, there are limits on the extent to which these agencies can help communities. QSDS helps sericulture community enterprises to minimise their raw materials operating costs by providing low-cost supplies and free delivery services. However, its limited silkworm supplies constrain silk production which consequently limits the soap productivity, unless additional raw materials can be sourced cheaply from the private sector.

Furthermore, this research has shown that knowledge and technology transfer of soapmaking by TINT is not delivered to all sericulture communities in Thailand equally, as this depended on local needs and interests. Because TINT has no strategic plans regarding unique selling propositions for each enterprise, its actions might enhance the market saturation of sericin soap. Furthermore, since CT and BEDO apply different partnership strategies to rural communities, this could lead to differential economic growth between communities. As a result, this might degrade the effectiveness of the SMCE promotion scheme by enhancing socioeconomic disparities among rural communities. Besides, in spite of the efforts of agencies to diminish socioeconomic inequalities, impacts of government agencies on enterprise workers may differ significantly because individual people's practices and attitudes towards change can cause discrepancies.

This research has shown that the knowledge sharing and commercial support of community enterprise traders and government agencies help soapmakers to avoid being at the losing end of market asymmetries. Likewise, if there is a wide range of traders, with a variety of distribution capacities, then this can enable products to reach consumers in areas inaccessible to the producers themselves. Competition between different types of traders help to minimise exploitation in the chain. However, this may come at the expense of the various capacities and distribution channels of traders, along with the personal relationships and degree of trust already established between producers and traders. However, since some soapmakers choose to trade with certain traders with whom they have already established trust, the soap market is overpowered by certain groups of traders. But, the threat of exploitation is alleviated by cultivating and maintaining strong personal relationships, as well as by the standard profit-sharing schemes set by community enterprises.

Objective 4: To Explore the Environmental Impacts of Soap Production, Trade, and Consumption

The environmental impacts of each soap value chain differ because of individual chain actors' behaviours and practices, which shape the commodity chain. The level of environmental impacts of soap commodity chain is influenced by how soaps are produced, how wastes are treated, how soaps are transported from production to consumption sites with the assistance of traders, and how consumers use and dispose of soaps and their packaging materials.

Producers and locals generally feel that soap production has limited negative environmental impact compared with existing agricultural practices. The environmental impacts from silk production have been reduced by retrieving pure sericin for making soap using the HTHP degumming method originally introduced by TINT. Furthermore, this research has revealed that BEDO and CT encourage soapmakers to minimise the use of synthetic chemicals in soap production and to reuse wastes whenever possible. However, this research argues that the degree to which environmental pollution is minimised depends on individual practices and lifestyles which are influenced by environment, culture, their socioeconomic backgrounds, and chain actors' interdependencies.

This research has explored the degree to which soap effluents and packaging impact the environment and demonstrated that there has been little understanding of this aspect of the commodity chain of Thai sericin soap production.

10.2 Contributions to Theoretical Approaches

This research has contributed to theoretical approaches in five key areas: 1) employing the *Follow the Thing* approach as a political tool to evaluate the government performance; 2) applying the *Follow the Thing* approach to the cosmetics industry; 3) adopting the *Follow the Thing* approach to explore environmental aspects of the commodity chain; 4) using the *Follow the Thing* approach to analyse the geographies of consumption in both the West and the East; and 5) exploring the relevance and uses of the *Follow the Thing* approach in community development, environmental conservation, ethical trade, and ethical consumption.

10.2.1 Employing the *Follow the Thing* Approach as a Political Tool to Evaluate the Government Performance

This study has contributed to the broader literature by adopting the *Follow the Thing* approach as an explicit political tool to demonstrate the strengths and weaknesses of government agencies, including the effectiveness of government policies. The *Follow the Thing* approach enables examination of the extent to which government policies have achieved their objectives or caused unwanted secondary effects. It allows identification of people and geographies which are impacted from government intervention, and reveals other issues related to implementation of policy.

Using the *Follow the Thing* approach, this study has shown that the success of sericulture community enterprises in running soap businesses requires political support of the Royal Thai government through its nationwide SMCE and OTOP promotion schemes to create an enabling environment for producers and traders to benefit and profit in a fair and transparent manner. This approach helps analyse the government's contribution to community development, environmental conservation, ethical trade, and ethical consumption along the value chain. This research's findings, conclusions, and recommendations can be used to help the government reform its governance and tailor appropriate assistance to improve the quality of life of

stakeholders, to minimise environmental impacts of the commodity chain, and to enhance the fairness of benefits to stakeholders.

10.2.2 Applying the *Follow the Thing* Approach to the Cosmetics Industry

This study fills the gap in the commodity chain literature by applying the *Follow the Thing* approach to soap, a natural cosmetics commodity. The cosmetics industry has previously been neglected in terms of commodity chain analysis (Lovett, 2004; Clark et al., 2011).

10.2.3 Adopting the *Follow the Thing* Approach to Explore Environmental Aspects of the Commodity Chain

This study fills the gap in the commodity chain literature by employing the *Follow the Thing* approach to explore both environmental interactions within—and impacts of—the commodity chain, and addresses debates concerning political ecology in the commodity chain.

10.2.4 Using the *Follow the Thing* Approach to Analyse the Geographies of Consumption in Both the West and the East

This study bridges a gap in the literature by applying the *Follow the Thing* approach to both the West and the East to compare soap consumption patterns and purchase behaviours of consumers in Thailand and the UK. This emphasises the importance of consumer culture which underpins consumption behaviour. Likewise, this highlights the impacts of local to global consumption of soap which can trigger profit-sharing with other chain actors in the midstream to upstream industries.

10.2.5 Exploring the Relevance and Uses of the *Follow the Thing* Approach in Community Development, Environmental Conservation, Ethical Trade, and Ethical Consumption

This research contributes to the broader literature by applying the *Follow the Thing* approach to explore issues of community development, environmental conservation, ethical trade, and ethical consumption in the value chain. The *Follow the Thing* approach is useful as it combines a variety of theoretical approaches into a single method by which the complexities of social and environmental interactions within the commodity chain may be understood.

10.3 Recommendations for Policy Makers

The following recommendations are based on the findings of this research and are focused on achieving sustainable development in Thailand.

10.3.1 Scaling Up Circular Economy Projects

Soap production by rural sericulture communities fits well with the development strategy of the 12th National Economic and Social Development Plan of Thailand (2017-2021). The soap production scheme aligns with four out of ten national strategies included in that plan: Strategy 1, Human capacity development; Strategy 2, Promoting social fairness and reducing inequality; Strategy 3, Strengthening a sustainable economy and developing competitiveness; and Strategy 4, Green growth for sustainable development (PRD, 2016). Likewise, soap production that utilises technology and innovation for the green economy also serves the 'Thailand 4.0' policy which aims for a value-based, balanced development and innovation-driven economy (DRAEQA, 2016).

Soap production also corresponds to six United Nations Sustainable Development Goals under the 2030 Agenda for Sustainable Development (UN, 2015): Goal 1, No poverty; Goal 5, Gender equality; Goal 8, Decent work and economic growth; Goal, 10 Reduced inequalities; Goal 11, Sustainable cities and communities; and Goal 12, Responsible consumption and production.

This research suggests that community enterprises could improve their value chains by aiming for organic soap production with no use of synthetic chemicals, and by using biodegradable packaging and ingredients, reusing all wastes in the production chain, and treating wastewater from the cosmetic production house before releasing it to nature. This would have the advantage of improving the community's well-being and minimising environmental impacts while differentiating their products from synthetic soaps in the market.

Storytelling in relation to the products would also contribute greatly to marketing the communities. Developing an organic, waste-free and environmentally friendly niche in the market would allow producers to access wider consumer bases which could potentially bring more profits to all chain actors. This model of *zero waste* and an *organic soap village* could be

adopted across the whole nation in order to help the country achieve sustainable green growth (UNDP, 2016).

However, in order to avoid excess supply in the market, other communities may choose to differentiate themselves by producing other kinds of organic products from natural resources and waste by-products from their areas. This could be done based on local knowledge, conditions, and needs (Sjögersten *et al.*, 2013). Market research and a full feasibility study would be required to increase success rates (Changwatchai and Santipolvut, 2015). Adopting this model at the grassroots level would support a circular economy in Thailand and move the country towards creation of an organic cosmetic hub in Southeast Asia (Garcia, Quaratesi and Sincharoen, 2011) while meeting both domestic and international goals for sustainable development.

10.3.2 Developing a Standard Sustainability Assessment Framework for Community Development Projects

Although the Thai government has shown the political willpower and has policies in place to achieve green growth and poverty alleviation, this study clearly shows that—in supporting SMCEs in practice—economic development is favoured and environmental conservation is neglected (PRD, 2016). The Royal Thai government does not have a standard sustainability assessment framework for community development projects (PRD, 2016). Consequently, each government agency has independently formulated project assessment frameworks along with indicators based on its particular project objectives.

Although these agencies do empower communities to minimise their environmental impacts to some extent, it is still difficult to compare these agencies' performances and to ensure that their actions meet the sustainable development goals of the nation. Without this standard, decision-making regarding sustainability across the nation is unlikely to fully reflect the government's vision, despite the fact that goals and indicators are already in place at sectoral, regional, and national levels in order to meet the UN Sustainable Development Goals (Lorjeerachunkun and Jitratawate, 2012; UN, 2015; SDG MOVE THAILAND, 2016; PRD, 2016; Official Statistics Thailand, 2018).

A clear recommendation from this research is that the Royal Thai government should develop a standard sustainability assessment framework

specifically for community development projects which all agencies should adopt for their project assessments. This can be adapted from existing models and indicators, modified to make it appropriate for the local Thai context (Fraser *et al.*, 2006; Pope and Grace, 2006; Hacking and Guthrie, 2008; Bond, Morrison-Saunders and Pope, 2012; Pintér *et al.*, 2012).

Bond and Morrison-Saunders (2012) note that sustainability assessment can engender better learning for all stakeholders involved. In this regard, this would allow the government and stakeholders to compare the impacts, strengths, and weaknesses of these agencies relative to society and the environment, while monitoring the change of these communities in a systemic manner. It is important to point out that this should be developed democratically with input from community members and stakeholders in terms of what areas should be prioritised and accepted as part of this framework (Sinclair and Diduck, 2001; Bond and Morrison-Saunders, 2012; UNDP, 2016). Fraser *et al.* (2006) note that this can lead to community empowerment where conventional development approaches have failed because local values can be realised and relevant and appropriate management decisions can be executed.

Government agencies should apply the *Follow the Thing* approach in the sustainability assessment framework when evaluating the impacts of their OTOP projects. Agencies should measure sustainability impacts along the commodity chains, and should better understand issues of dependency, dominance, poverty, and exploitation, which may occur in the commodity system (Appadurai, 1986; Kopytoff, 1986; Cook, 2004; Hughes and Reimer, 2004; Gregson *et al.*, 2010; Yeh and Lama, 2013; Saguin, 2014; Turner, 2015). This will allow the government to understand its impacts from local to global scales, on stakeholders and on the environment, including the strengths and weaknesses of its projects, governance, and policies.

At present, collaboration between Thai government agencies is limited to only a few programs (Krueathep, 2008) meaning that the agencies may be better off if they manage to collaborate more effectively and to learn best practices from each other through this sustainability assessment framework.

10.3.3 Educating the Public about Ethical Consumption

Findings from this study have shown that consumers were not aware of the wider impacts of their consumption. Although some awareness of ethical consumption has already been raised by both public and private actors internationally, these efforts are not much in evidence in Thailand (Arli, Tjiptono and Winit, 2015). The Thai government should educate the public about ethical consumption through various media and education programmes and should also set standards on what is considered ethical consumption. Similarly, it should set regulations for businesses to increase the supply chain transparency, by presenting information about labour conditions and environmental impacts to the public, through green marketing and ethical labelling and certification such as Fair trade (Todd, 2004; Nicholls and Opal, 2005; Howard and Allen, 2006; Hartlieb and Jones, 2009; Kim, Lee and Park, 2010; Annunziata, Ianuario and Pascale, 2011). This will enable consumers to make more informed decisions and likewise influence good practices in the value chain. These measures would feedback positively, reinforcing each other and greatly benefitting society as a whole.

10.3.4 Improving Basic Infrastructure

Many sericulture communities are situated in rural areas which lack access of public transport and transport infrastructure. Jaensirisak *et al.*, (2017) show that Thailand's transport sector for domestic passengers is dominated by road, rail, and air, in order of decreasing prominence, while freight transport is likewise dominated by road, water, and the rail network. These services have low efficiency and there is a lack of choices in rural areas (APEC, 2011; Jaensirisak *et al.*, 2017). This has affected the livelihood options and decision-making of locals, the net profits a community enterprise can generate, the level of dependency and exploitation within the value chain, and the agencies and stakeholders who can support or collaborate with the enterprises. As a result, this lack of efficient and effective transport options exacerbates socioeconomic disparities between urban and rural areas and gives disproportionate power to those actors who can overcome the transport issues and take advantage of the commodity system.

In other words, this research concludes that lack of transport is a key obstacle which impedes Thailand to achieve its sustainable development goals. Although the government already has its National Transport Master Plan in place (Jaensirisak *et al.,* 2017), results show that the improvement

of infrastructure has not been well decentralised yet, especially in rural areas.

To tackle this matter, the Thai government should reform this basic transport infrastructure and at least provide the standard transport options across the country for people with different abilities of mobility, incomes, and ages, to enhance equity which has been neglected to some extent (Donnges, 2001; Currie *et al.*, 2007; Davey, 2007; Pinstrup-Andersen and Shimokawa, 2008; APEC, 2011; Department of Empowerment of Persons with Disabilities, 2016). Upgrading transport facilities and networks will not only enhance the mobility of locals, goods, and services, but will also help to reduce poverty and isolation while improving the livelihoods and life opportunities of rural citizens (Donnges, 2001; Tacoli, 2003; Porter, 2014).

10.3.5 Improving Adult Learning Capabilities

Argote and Ingram (2000) argue that a business's competitive advantage is based in its ability to create and transfer knowledge while preventing external transfer to competitors. Likewise, the success and sustainability of a community enterprise is dependent on the internal transfer of knowledge and its members' ability to learn from each other. The knowledge of an individual within a group impacts the experience of others and thus influences group performance. This in turn can impact the quality of the product line and enhance an enterprise's competitiveness (Singley and Anderson, 1989; Darr, Argote and Epple, 1995; Argote and Ingram, 2000).

Several factors can influence the transfer of knowledge across social units. The psychology of the individuals involved and the technologies they use are both important, as are issues like individuals' networks, personnel mobility and routines (Argote and Ingram, 2000; Rosenkopf and Almeida, 2003; Kane, Argote and Levine, 2005; Gupta, Hoopes and Knott, 2015; Mawdsley and Somaya, 2016). Learning abilities within an enterprise community can vary greatly, and this might impact what people are able to learn from government agencies, and the extent that they are able to use the technologies the agencies promote.

Studies show that in Thailand little research has been done into the learning abilities of people in rural areas or how their particular needs or disabilities might impact learning (Atchoarena and Gasperini, 2003; Ministry of

Education, 2008). Atkin and Merchant (2004) suggest poor literacy and numeracy is linked to a rural economy which tends to confine people (particularly the elderly) in a limited sociocultural environment. As such, there is a tendency for those in rural areas to undervalue learning in favour of practical work, and this in turn influences the 'rural masculine and feminine identity' (Atkin and Merchant, 2004, p.6).

UNDP (2016) states that access to education and skill development are crucial factors in reducing poverty. Although lifelong formal, non-formal and informal education exists in Thailand's rural communities, it remains inadequate and lack of availability helps to maintain the rural-urban gap. Somtrakool (2002) argues that despite the existence of educational programs the elderly in Thailand have few educational opportunities.

This research suggests that Thailand's existing education system should be able to address issues of education and training in rural communities. Likewise, it should be able to address issues related to gender, disability, age and physical and mental health. To enhance the effectiveness of locals in rural areas, programmes that meet their learning capacities and offer the same standard of education should be expanded across the country (Somtrakool, 2002; Atchoarena and Gasperini, 2003; Atkin and Merchant, 2004; Atkin, Rose and Shier, 2005; Ministry of Education, 2008; Atkin, 2010; OECD, 2013).

Alongside traditional education, a modern education system based on indigenous knowledge would also prove beneficial for those in Thailand's rural areas (Cavallo, 2000; FAO, 2002; Atchoarena and Gasperini, 2003). This approach would recognise local talents and intelligence (Cavallo, 2000) and help preserve and enhance sociocultural heritage and integrity (Atchoarena and Gasperini, 2003). Educational reform of this nature would support the people-centred development approach Thailand's government has adopted to alleviate social and economic disparity and increase the effectiveness of existing grassroot community support (Kelly *et al.*, 2012). The education system based on their culture and traditions can enhance people's ability to transfer knowledge within the same organisation, allowing them to support the enterprise better and thus improving the likeliness of an enterprise's success.

10.3.6 Using Partnership Strategies to Reduce Dependency of Communities on Government

This research recommends that a strategy for community enterprises to reduce their dependence on government agencies and intermediaries is for them to expand their strategic alliances and partnerships with other public and private organisations, university research groups, or Non-Government Organisations (NGOs) with clear aims and objectives (Davies, 2002; Nawir and Santoso, 2005; Krueathep, 2008; Derkzen and Bock, 2009). This kind of small-scale, local partnership is quite absent in Thailand, where public and private partnerships on mega infrastructure projects are more common (Pongsiri, 2003; Krueathep, 2008; Kokkaew, Sunkpho and Alexander, 2013; Chanapai and Suttawet, 2018; PWC, 2018). In the community partnership approach, communities can benefit from the services, resources, skills, and knowledge of their partners, leading to social, technical, environmental, and business learning (Nawir and Santoso, 2005; Bull, Petts and Evans, 2008).

Likewise, this would help rural communities enhance their resilience, economic empowerment, and sustainability (Davies, 2002; Moseley, 2003). It would reduce the impacts of external shocks if agencies reduce support to communities and ameliorate the negative influence of lack of knowledge or capabilities (Seixas & Berkes, 2010). However, conflicts can happen because of poor coordination, lack of trust, and unclear division of tasks (Moseley, 2003; Nawir and Santoso, 2005). In the process of collaboration, it may take time for actors and potential partners to find common interests (Moseley, 2003). Hence, the selection of the right partner and partnership arrangement are essential for this proposed collaboration and coordination to work (Greer, 2001).

This research agrees with Miraftab (2004) and strongly recommends that partnerships should be structured and maintained in such a way that they do not exacerbate local communities' conditions or negatively impact the environment, but rather serve community and environmental interests.

Understanding of discrepancies in partners' social and institutional capacities is a necessary element, so these issues can be discussed and resolved by stakeholders when they formulate their partnership strategies, in order to formulate equitable processes that will ensure equitable outcomes and equitable horizontal power relations (Miraftab, 2004; Nawir & Santoso,

2005). In this regard, it is necessary that government intervene by issuing regulations and policies to ensure that equitable partnerships are formed with community enterprises. Exploitation and dependence can be reduced in this alliance when all partners get their fair share of mutual benefits and have complementary roles. Moreover, government agencies which already partner with community enterprises and non-government organisations may help to initiate partnerships for other communities (Edwards *et al.*, 2000; Nawir and Santoso, 2005).

10.4 Limitations of the Study

In common with all research studies, there were financial and time constraints which limited the reach of this study. In addition, communication difficulties with locals in the Northeast region of Thailand required time and understanding to overcome, and this also limited the number of respondents. Most interviews with Thai people were conducted in Thai before being translated into English, and this can result in meanings not being fully captured.

If I were to repeat this research, I would interview more people in each case study region and employ the same numbers of interviews and questionnaires across case study locations, necessitating living in each village for a longer period. Extended periods in each location would have helped to understand the local contexts and interactions between chain actors better and enabled me to monitor daily life in various seasons of the year. Likewise, questionnaires could have been improved by collecting more information about the quantitative data of socioeconomic backgrounds of farmers such as sizes of their farms, including amounts of chemicals used and wastes released in the process.

10.5 Future Research

This research has focused on qualitative investigation of the social and environmental impacts of the soap value chain. Future research should focus on quantitative analysis of environmental impacts of the chain from chemicals used and wastes released. Long-term study is required to collect this data, in order to estimate total amounts and observe changes in chain actors' behaviours and lifestyles in all seasons. Likewise, future study should focus on using life cycle assessment (LCA) on soap and other kinds of silk-

related products in order to contribute to existing literature which focuses only on LCA of silk but not for its extended activities (Astudillo, Thalwitz and Vollrath, 2014, 2015).

In order to reflect a more comprehensive understanding of the extended soap industry in Thailand, a greater number of case studies would enable a broader understanding of social and environmental interactions within the commodity chain in a broader range of geographies. Since various Thai government agencies have come to assist community enterprises in various aspects, future research should examine how they exert control in different parts of the commodity chain and impact communities and the environment. Similarly, future research should discover, evaluate, and propose best practices which government agencies should carry out in order to maximise benefits to all stakeholders and to sustain rural community development projects in the longer term.

References

Abbot, J. and Guijt, I. (1997) 'Methodological complementarity.', in PLA Notes. London: International Institute for Environment and Development, pp. 27–32.

Abbott, J. C. (1987) 'Institutional reform of marketing and related services to agriculture, with particular reference to Africa', Agricultural Economics, 1(2), pp. 143–157.

Abdullaev, I. K. and Guseinova, P. A. (1961) 'The chemical composition of the leaves of selected varieties of mulberry.', Doklady Akademii Nauk Azerbaidzhana, 17, pp. 723–726.

Aday, L. A. and Cornelius, L. J. (2006) Designing and conducting health surveys: a comprehensive guide. 3rd editio. San Francisco: Jossey-Bass.

Adithya, H. S. (2011) Soaps - an explorative study on consumer behaviours in Bangalore city. Educational and Research Institute University.

Agarwal, B. (2001) 'Participatory Exclusions, Community Forestry, and Gender: An Analysis for South Asia and a Conceptual Framework', World Development, 29(10), pp. 1623–1648.

Agricultural Technologies (no date) Management of silkworm rearing, mounting & production of cocoon., India Agronet.

Agrifood Consulting International (2005) 'Northeast Thailand Silk Value Chain Study', pp. 1–4.

Akter, N., Rahman, A. and Chowdhury, M. (1998) Environmental investigation and evaluation of sericulture programme and Ayesha Abed Foundation. Dhaka.

Al-Amer, R. et al. (2015) 'Translation of interviews from a source language to a target language: examining issues in cross-cultural health care research', Journal of Clinical Nursing, 24(9–10), pp. 1151–1162.

Ali, A. et al. (2018) 'Antecedents of consumers' Halal brand purchase intention: an integrated approach', Management Decision, 56(4), pp. 715–735.

Ampuero, O. and Vila, N. (2006) 'Consumer perceptions of product packaging', Journal of Consumer Marketing, 23(2), pp. 100–112.

Anbumozhi, V. (2007) Eco-Industrial Clusters in Urban-Rural Fringe Areas. Hyogo: Institute for Global Environmental Strategies (IGES).

Anderson, C. (2010) 'Presenting and evaluating qualitative research.', Americal Journal of Pharmaceutical Education, 74(8), pp. 1–7.

Annunziata, A., Ianuario, S. and Pascale, P. (2011) 'Consumers' Attitudes Toward Labelling of Ethical Products: The Case of Organic and Fair Trade Products', Journal of Food Products Marketing. 17(5), pp. 518–535.

APEC (2011) The Impacts and Benefits of Structural Reforms in the Transport, Energy and Telecommunications Sectors in APEC Economies. Edited by C. Findlay. Asia-Pacific Economic Cooperation.

Appadurai, A. (1986) Social life of things: commodities in cultural perspective. Cambridge: Cambridge University Press.

Aramwit, P. et al. (2010) 'Properties and anti-tyrosinase activity of sericin from various extraction methods.', Biotechnology and Applied Biochemistry, 55, pp. 91–98.

Aramwit, P. (2014) 'Bio-response to silk sericin', in Kundu, S. (ed.) Silk Biomaterials for Tissue Engineering and Regenerative Medicine. New Delhi: Woodhead Publishing, pp. 299–329.

Aramwit, P., Siritientong, T. and Srichana, T. (2012) 'Potential applications of silk sericin, a natural protein from textile industry by-products', Waste Management & Research, 30, pp. 217–224.

Arce, A. and Marsden, T. K. (1993) 'The Social Construction of International Food: A New Research Agenda', Economic Geography. Taylor & Francis, Ltd., 69(3), p. 293.

Argote, L. and Ingram, P. (2000) 'Knowledge Transfer: A Basis for Competitive Advantage in Firms', Organizational Behaviour and Human Decision Processes. Academic Press, 82(1), pp. 150–169.

Arli, D., Tjiptono, F. and Winit, W. (2015) 'Consumer ethics among young consumers in developing countries: a cross national study', Social Responsibility Journal, 11(3), pp. 449–466.

Aruga, H. (1994) Principles of Sericultures. CRC Press.

Astudillo, M. F., Thalwitz, G. and Vollrath, F. (2014) 'Life cycle assessment of Indian silk.', Journal of Cleaner Production, 81, pp. 158–167.

Astudillo, M. F., Thalwitz, G. and Vollrath, F. (2015) Life cycle assessment of silk production- a case study from India., Handbook of Life Cycle Assessment (LCA) of Textiles and Clothing. Edited by S. S. Muthu. Elsevier.

Atchoarena, D. and Gasperini, L. (2003) Education for rural development: towards new policy responses.

Atkin, C. (2010) 'A Decade of Rural Research: What have We Learnt about Adult Language, Literacy and Numeracy?', International Education Studies, 3(4).

Atkin, C. and Merchant, P. (2004) The impact of adult literacy and numeracy on small businesses in rural Lincolnshire and Rutland: a case study.

Atkin, C., Rose, A. and Shier, R. (2005) Provision of, and learner engagement with, adult literacy, numeracy and ESOL support in rural England: a comparative case study.

Auger, P. et al. (2003) 'What will consumers pay for social product features?', Journal of Business Ethics Feb, 42(3).

Australian Educational International (2013) Thailand regulatory fact sheet.

Ayres, L., Kavanaugh, K. and Knafl, K. A. (2003) 'Within-Case and Across-Case Approaches to Qualitative Data Analysis', Qualitative Health Research, 13(6), pp. 871–883.

Azuizkulove, D. (2013) 'Country of origin and brand loyalty on cosmetic products among Universiti Utara Malaysia students', Atlantic Review of Economics, 2.

Babu, K. M. (2012) Handbook of Natural Fibres, Handbook of Natural Fibres.

Babu, K. M. (2013) Silk, Silk. Elsevier.

Badaoui, K. et al. (2018) 'The influence of personal and social identity on the clothing consumption of adolescents', Canadian Journal of Administrative Sciences, 35(1), pp. 65–78.

Bahar, M. H. et al. (2011) 'Performance of polyvoltine silkworm Bombyx mori L. on different mulberry plant varieties', Entomological Research, 41(2), pp. 46–52.

Bailey, J. (2008) 'First steps in qualitative data analysis: transcribing', Family Practice, 25(2), pp. 127–131.

Bair, J. (2008) Frontiers of commodity chain research. Edited by J. Bair. Stanford University Press.

Bair, J. (2009) 'Global commodity chains: genealogy and review', in Frontiers of Commodity Chain Research. Stanford University Press.

Bair, J. (2014) 'Commodity chains in and of the world-system', Journal of World-Systems Research, 20(1), pp. 1–10.

Balasubramanian, S., Raghunathan, R. and Mahajan, V. (2005) 'Consumers in a multichannel environment: Product utility, process utility, and channel choice', Journal of Interactive Marketing, 19(2), pp. 12–30.

Bangkok Focus (2017) 11th Anniversary of Thailand Institute of Nuclear Technology: Enhancing economic potentials to support SMEs (in Thai).

Barrett, H. R., Browne, A. W. and Ilbery, B. W. (2004) 'From farm to supermarket: the trade in fresh horticultural produce from sub-Saharan

Africa to the United Kingdom', in Hughes, A. and Reimer, S. (eds) Geographies of Commoidty Chains. Abing: Routledge, pp. 19–38.
Barsky, J. and Nash, L. (2002) 'Evoking Emotion: Affective Keys to Hotel Loyalty', The Cornell Hotel and Restaurant Administration Quarterly. SAGE Publications, 43(1), pp. 39–46.
Basavaraja, H. K. et al. (2005) A Text Book on Silkworm Breeding and Genetics. Bangalore, India.
Baudrillard, J. (1988) 'Consumer society.', in Poster, M. (ed.) Selected writings. Cambridge: Policy Press.
Bbenkele, E. (1986) Understanding consumer behaviour in the less developed countries: an empirical investigation of brand loyalty in Zambia. University of Stirling.
Beckett, K. (2015) The role of natural product value chains in the post-2015 development agenda.
Bedford, K. and Rai, S. M. (2010) 'Feminists Theorize International Political Economy', Signs: Journal of Women in Culture and Society. The University of Chicago Press, 36(1), pp. 1–18.
BEDO (2016a) BEDO Fact Sheet. Bangkok.
BEDO (2016b) 'Chumtabong Community Enterprise: From Silk to Skin (in Thai)', BEDO Magazine.
Belk, R., Devinney, T. and Eckhardt, G. (2005) 'Consumer Ethics Across Cultures', Consumption Markets & Culture. Routledge, 8(3), pp. 275–289.
Belton, B. and Little, D. (2008) 'The development of aquaculture in Central Thailand: Domestic demand versus export-led production', Journal of Agrarian Change, 8(1), pp. 123–143.
Bergmann, W. (1940) 'Relations between the food and silk and silkworms (Bombyx mori L.).', Textile Research, 10, pp. 462–475.
Bernard, R. H. (2006) Research methods in Anthropology: Qualitative and Quantitative approaches. 4th edition. Oxford: AltaMira Press.
Bhruksasri, W. (1989) Hill tribes today : problems in change. Edited by J. McKinnon and B. Vienne. Bangkok.
Bilsborrow, R. E. et al. (1987) 'The Impact of Origin Community Characteristics on Rural-Urban Out-Migration in a Developing Country', Demography. SpringerPopulation Association of America, 24(2), p. 191.
BEDO (2013) Encyclopedia of biodiversity in Chumtabong subdistrict in Nakhon Sawan province. Nonthaburi province: BEDO.
BEDO (2014a) Bio-Economy criteria.
BEDO (2014b) BEDO Report.

BEDO (2014c) Types of product promotion logos.
Bird, K. et al. (2011) Poverty, income inequality and microfinance in Thailand. Manila.
Blaschke, J. W. (2005) 'Globalization of Cosmetic Regulations', Food and Drug Law Journal, 60.
Blog (2015) Whole lotta Thailand: 77 things to do in 77 provinces.
Bolarinwa, O. A. (2015) 'Principles and methods of validity and reliability testing of questionnaires used in social and health science researches.', The Nigerian postgraduate medical journal. Medknow Publications and Media Pvt. Ltd., 22(4), pp. 195–201.
Bond, A. and Morrison-Saunders, A. (2012) 'Better learning', in Bond, A., Morrison-Saunders, A., and Howitt, R. (eds) Sustainability Assessment Pluralism, Practice and Progress. Oxon: Routledge, pp. 216–230.
Bond, A., Morrison-Saunders, A. and Pope, J. (2012) 'Sustainability assessment: the state of the art', Impact Assessment and Project Appraisal. TF, 30(1), pp. 53–62.
Bonner, A. and Tolhurst, G. (2002) 'Insider-outsider perspectives of participant observation', Nurse Researcher, 9(4), pp. 7–19.
Booker, A. et al. (2014) 'Chemical variability along the value chains of turmeric (Curcuma longa): a comparison of nuclear magnetic resonance spectroscopy and high performance thin layer chromatography.', Journal of ethnopharmacology, 152(2), pp. 292–301.
Boonchoo, S. (2008) 'International forum on distinctive signs for collective use: Non-agricultural products'. Versailles: The World Intellectual Property Organization (WIPO) and the National Institue of Industrial Property (INPI).
Boonchoo, S. and Rakpong, N. (2011) Wisdom of indigenous Thai silk yarn (in Thai). Bangkok.
Bora, D., Khanikor, B. and Gogoi, H. (2012) 'Plant Based Pesticides: Green Environment with Special Reference to Silk Worms', in Pesticides - Advances in Chemical and Botanical Pesticides.
Borrus, M., Ernst, D. and Haggard, S. (2000) International Production Networks in Asia. Rivalry or Riches?, Edited by Michael Borrus, Dieter Ernst, and Stephan Haggard. London and New York: Routledge.
Boulstridge, E. and Carrigan, M. (2000) 'Do consumers really care about corporate responsibility? Highlighting the attitude—behaviour gap', Journal of Communication Management, 4(4), pp. 355–368.
Bourdieu, P. (1984) Distinction: A social critique of the judgement of taste. London: Routledge and Kegan Paul.

Bremmer, H., Prud'homme de Lodder, L. and Van Engelen, J. (2006) Cosmetic Factsheet: To assess the risks for the consumer. Blthoven.

Brooks, A. and Bryant, R. (2013) 'Consumption', in Death, C. (ed.) Critical Environmental Politics. Routledge, pp. 72–82.

Brown, I. (1980) 'Government initiative and peasant response in the Siamese silk industry, 1901-1913', Journal of the Siam Society, 68(2).

Brown, J. R. and Goolsbee, A. (2002) 'Does the internet make markets more competitive? Evidence from the life insurance industry.', Journal of Political Economy, 110(31).

Bull, R., Petts, J. and Evans, J. (2008) 'Social learning from public engagement: dreaming the impossible?', Journal of Environmental Planning and Management, 51(5), pp. 701–716.

Busch, L. and Juska, A. (1997) 'Beyond Political Economy: Actor Networks and the Globalization of Agriculture', Review of International Political Economy. Taylor & Francis, Ltd., pp. 688–708.

Butkhup, L. et al. (2012) 'Phenolic composition and antioxidant activity of Thai and Eri silk sericins', Food Science and Biotechnology, 21(2), pp. 389–398.

den Butter, F. A. G. and Mosch, R. H. J. (2003) 'Trade, Trust and Transaction Costs', SSRN Electronic Journal.

Carboni, P. (1952) Silk, Biology, Chemistry and Technology. London: Chapman & Hall.

Carney, D. (1995) Changing public and private roles in agricultural service provision: a literature survey. Overseas Development Institute.

Carrigan, M. and Attalla, A. (2001) 'The myth of the ethical consumer – do ethics matter in purchase behaviour?', Journal of Consumer Marketing, 18(7), pp. 560–578.

Caseley, J. C., Cussans, G. W. and Atkin, R. K. (1991) Herbicide resistance in weeds and crops. Butterworth-Heinemann.

Castagno, A. (2012) 'What makes critical ethnography "critical"?', in Lapan, S. D., Quartaroli, M. T., and Riemer, F. J. (eds) Qualitative research: an introduction to methods and designs. San Francisco: Jossey-Bass.

Cavallo, D. (2000) 'Emergent design and learning environments: building on indigenous knowledge', IBM Systems Journal, 39(3&4).

Central Intelligence Agency (2015) The World Factbook: Thailand.

Chaimongkon, T. (2013) Condition supporting the development of organic agriculture of small farmers in Po Thong Charoen Village. Chiangmai University.

Chambers, P. (2013) 'Economic Guidance and Contestation: An Analysis of Thailand's Evolving Trajectory of Development.', Journal of Current Southeast Asia Affairs, 32(1), pp. 81–109.

Chambers, R. (1994) 'Participatory rural appraisal (PRA): Challenges, potentials and paradigm', World Development, 22(10), pp. 1437–1454.

Chanakit, T. (2016) Thai stakeholder's perceptions of the introduction of the Doctor of Pharmacy programme. Nottingham.

Chanapai, S. and Suttawet, C. (2018) 'Cooperation between public and private sectors in providing workforces and development of labour efficiency in the motorcycle industry', Kasetsart Journal of Social Sciences, pp. 1-6.

Changwatchai, P. and Santipolvut, S. (2015) 'The Enhancement of Community Enterprises in Thailand: Case Study of Ban Nongwha Mushroom Community Enterprise', in Proceedings of the Third Asia-Pacific Conference on Global Business, Economics, Finance and Banking.

Charmaz, K. (2014) Constructing grounded theory. 2nd edn. Edited by J. Seaman. London: SAGE.

Charsombut, P. and Islam, R. (1992) 'Chapter 8: Adoption and diffusion of new technology in cottage industries of rural Thailand: a case study of basketry and silk industries.', in Islam, R. (ed.) Transfer, adoption, and diffusion of technology for small and cottage industries. International Labour Organization, pp. 256–292.

Chatterjee, I. (2007) 'Packaging of Identity and Identifiable Packages: A study of women–commodity negotiation through product packaging', Gender, Place & Culture. Taylor & Francis Group, 14(3), pp. 293–316.

Cherndoi subdistrict Council (2016) General information of Cherngdoi subdistrict Council (in Thai).

Chi, H. K., Yeh, H. R. and Yang, Y. T. (2009) 'The Impact of Brand Awareness on Consumer Purchase Intention: The Mediating Effect of Perceived Quality and Brand Loyalty.', The Journal of International Management Studies, 4(1).

Choenkwan, S., Fox, J. M. and Rambo, A. T. (2014) 'Agriculture in the Mountains of Northeastern Thailand: Current Situation and Prospects for Development', Mountain Research and Development, 34(2), pp. 95–106.

Chongkum, S. (2003) Role of nuclear energy in Thailand. Kyoto.

Chumtabong subdistrict Administrative Organisation (2016) General information of Chumtabong subdistrict (in Thai).

Clark, A. et al. (2011) Promoting sustainability in the value chain of Natural Bisabolol, a Brazilian rainforest product.

Clement, J. (2007) 'Visual influence on in-store buying decisions: an eye-track experiment on the visual influence of packaging design', Journal of Marketing Management, 23(9–10), pp. 917–928.

Clinic Technology (2012a) Report of science and technology network village project: Nayaw-NaUdom community 2012. Buriram.

Clinic Technology (2012b) Science and Technology village report: Nayaw-NaUdom community (in Thai).

Clinic Technology (2013a) Full report on Huaysai green sericulture community 2013. Nakhon Ratchasima.

Clinic Technology (2013b) Report of science and technology network village project: Nayaw-NaUdom community 2013. Buriram.

Clinic Technology (2014) Full report on Huaysai green sericulture community 2014. Nakhon Ratchasima.

Cohen, L. H. (1997) Glass, paper, beans. London: Doubleday.

Collins, K. M. T. (2010) 'Advanced sampling designs in mixed research: Current practices and emerging trends in the social and behavioural sciences.', in Tashakkori, A. and Teddlie, C. (eds) Mixed Methods in Social & Behavioral Research. 2nd edn. California: SAGE Publications.

Colloredo-Mansfeld, R. (2003) 'Introduction: Matter Unbound', Journal of Material Culture. SAGE Publications, 8(3), pp. 245–254.

Conway, S. (1992) Thai Textiles. Bangkok: River Books Press.

Cook, I. (2004) 'Follow the thing: papaya', Antipode, 36(4), pp. 642–664.

Cook, I. (2006) 'Geographies of food: following.', Progress in Human Geography, 30(5), pp. 655–666.

Cook, I. et al. (2007) '"It"s more than just what it is': Defetishising commodities, expanding fields, mobilising change.', Geoforum, 38, pp. 1113–1126.

Cook, I. and Crang, P. (1996) 'The World On a Plate: Culinary Culture, Displacement and Geographical Knowledges', Journal of Material Culture, 1(2), pp. 131–153.

Cook, I., Crang, P. and Thorpe, M. (2004) 'Tropics of consumption: "Getting with the fetish" of "exotic" fruit?', in Hughes, A. and Reimer, S. (eds) Geographies of commodity chains. London: Routledge, pp. 173–192.

Cook, I. and Harrison, M. (2007) 'Follow the Thing: "West Indian Hot Pepper Sauce"', Space and Culture, 10(1), pp. 40–63.

Corbett, J. M. (2006) 'Scents of Identity: Organisation Studies and the Cultural Conundrum of the Nose', Culture and Organization, 12(3), pp. 221–232.

Corbitt, B. J., Thanasankit, T. and Yi, H. (2003) 'Trust and e-commerce: a study of consumer perceptions.', Electronic Commerce Research and Applications, 2, pp. 203–215.

Coulter, R. A. et al. (2005) 'The Evolution of Consumer Knowledge and Sources of Information: Hungary in Transition', Journal of the Academy of Marketing Science, 33(4), pp. 604–619.

Council of Agriculture (no date) Molecular Farming of Silkworm (Bombyx mori L.).

Crane, D. (2000) Fashion and Its Social Agendas: Class, Gender, and Identity in Clothing. University of Chicago Press.

Crang, M. et al. (2013) 'Rethinking governance and value in commodity chains through global recycling networks', Transactions of the Institute of British Geographers. Wiley/Blackwell, 38(1), pp. 12–24.

Crang, P. (1996) 'Displacement, consumption and identity.', Environment and Planning A. SAGE Publications: London, 28(1), pp. 47–67.

Creswell, J. W. (2014) Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. 4th edn. London: SAGE Publications.

Creswell, J. W. and Miller, D. L. (2000) 'Determining validity in qualitative inquiry.', Theory into Practice, 39(3), pp. 124–130.

Creswell, J. W. and Poth, C. N. (2017) Qualitative inquiry and research design: Choosing among five approaches. 4th edn. London: SAGE Publications.

Crewe, L. and Lowe, M. (1995) 'Gap on the map? Towards a geography of consumption and identity', Environment and Planning A, 27(12), pp. 1877–1898.

Creyer, E. H. (1997) 'The influence of firm behaviour on purchase intention: do consumers really care about business ethics?', Journal of Consumer Marketing, 14(6), pp. 421–432.

Curran, S. R. and de Sherbinin, A. (2004) 'Completing the picture: The challenges of bringing "consumption" into the population-environment equation', Population and Environment, 26(2), pp. 107–131.

Currie, G. et al. (2007) No way to go: transport and social disadvantage in Australian communities. Monash University ePress.

Daithankar, A. V et al. (2005) 'Moisturizing efficiency of silk protein hydrolysate : Silk fibroin', Indian Journal of Biotechnolgy, 4, pp. 115–121.

Dandin, S. B. and Kumar, S. N. (2007) 'Bio-medical uses of silk and its derivatives', Indian Silk, 45(9), pp. 5–8.

Dant, T. (2006) 'Material civilization: things and society', The British Journal of Sociology, 57(2), pp. 289–308.

Darr, E. D., Argote, L. and Epple, D. (1995) 'The Acquisition, Transfer, and Depreciation of Knowledge in Service Organizations: Productivity in Franchises', Management Science. INFORMS, 41(11), pp. 1750–1762.

Das, B. K. and Sikdar, A. K. (1970) 'Evaluation of some improved strains of mulberry by feeding experiment.', Indian Journal of Sericulture, 9, pp. 16–30.

Dash, P., Dash, S. and Behera, S. (2015) Women in Developing Sustainable Livelihood System Through Sericulture in Rural India.

Dash, R. et al. (2008) 'Antioxidant potential of silk protein sericin against hydrogen peroxide-induced oxidative stress in skin fibroblasts.', BMB Report, 41, pp. 236–241.

Dash, R. et al. (2008) 'Silk sericin protein of tropical tasar silkworm inhibits UVB-induced apoptosis in human skin keratinocytes.', Molecular and cellular biochemistry, 311(1–2), pp. 111–9.

Datta, R. K. (1992) Guidelines for Bivoltine Rearing. Bangalore, India.

Datta, R. K. (1996) Global Silk Scenario 2001. New Delhi: Oxford and IBH Publishing.

Datta, R. K. (no date) Mulberry cultivation and utilization in India, Food and Agriculture Organization.

Davey, J. A. (2007) 'Older people and transport: coping without a car', Ageing and Society. Cambridge University Press, 27(01), pp. 49–65.

Davies, A. (2007) 'Organic or Orchestrated: The Nature of Leadership in Rural Australia', Rural Society. Routledge, 17(2), pp. 139–154.

Davies, A. R. (2002) 'Power, politics, networks: shaping partnerhsips for sustainable communities', Royal Geographical Society, 34(2), pp. 190–203.

Davies, I. A., Lee, Z. and Ahonkhai, I. (2012) 'Do Consumers Care About Ethical-Luxury?', Journal of Business Ethics, 106(1), pp. 37–51.

Dearden, P. (1991) 'Tourism and sustainable development in Northern Thailand', Geographical Review, 81(4), pp. 400–413.

Deliya, M. M. and Parmar, B. (2012) 'Role of packaging on consumer buying behavior-Patan District.', Global Journal of Management and Business Research, 12(10).

Dennis, C. (1991) 'Constructing a career under conditions of economic crisis and structural adjustment: the survival strategies of Nigerian women.', in Afshar, H. (ed.) Women, Development and Survival in the Third World. London: Longman.

Denpaiboon, C. and Amatasawatdee, K. (2012) 'Similarity and Difference of One Village One Product for Rural Development Strategy in Japan and Thailand.', Japanese Studies Journal Special Issue: Regional Cooperation for Sustainable Future in Asia, pp. 52–62.

Department of Agriculture Extension (DOAE) (2005) Characteristics and criteria of small and micro community enterprises (in Thai).

Department of Empowerment of Persons with Disabilities (2016) Information on disability issues.

Derkzen, P. and Bock, B. (2009) 'Partnership and Role Perception, Three Case Studies on the Meaning of Being a Representative in Rural Partnerships', Environment and Planning C: Government and Policy. SAGE PublicationsSage UK: London, 27(1), pp. 75–89.

DeWalt, K. M. and DeWalt, B. R. (2011) Participant Observation: A Guide for Fieldworkers. Rowman Altamira.

Dewangan, S. K. (2013) 'LIVELIHOOD OPPORTUNITIES THROUGH SERICULTURE A MODEL OF GHARGHODA TRIBAL BLOCK, RAIGARH DIST.', American Journal of Environmental Sciences. Science Publications, 9(4), pp. 343–347.

Dewangan, S. K. et al. (2013) 'Sericulture for employment generation among the tribal -a study of two tribal block of Raigarh Dist. [C.G.] India.', International Journal of Biological, Biomolecular, Agricultural, Food and Biotechnological Engineering, 7(7).

Dewangan, S. K., Sahu, K. R. and Achari, K. V. (2011) 'Sericulture: A tool of eco-system checking through tribal.', Journal of Environmental Research and Development, 6(1).

Dhanirama, D., Gronow, J. and Voulvoulis, N. (2012) 'Cosmetics as a potential source of environmental contamination in the UK', Environmental Technology. Taylor & Francis, 33(14), pp. 1597–1608.

Dhurup, M., Mafini, C. and Dumasi, T. (2014) 'The impact of packaging, price and brand awareness on brand loyalty: Evidence from the paint retailing industry', Professional Accountant, 14(1), pp. 1–9.

Dicken, P. et al. (2001) 'Chains and networks, territories and scales: towards a relational framework for analysing the global economy', Global Networks. Wiley/Blackwell, 1(2), pp. 89–112.

Division of Research Administration and Educational Quality Assurance (DRAEQA) (2016) Blueprint of Thailand 4.0 model (in Thai).

Dodds, W. B., Monroe, K. B. and Grewal, D. (1991) 'Effects of Price, Brand, and Store Information on Buyers' Product Evaluations', Journal of Marketing Research. American Marketing Association, 28(3), p. 307.

Donnges, C. (2001) 'Rural transport and local government units: how to improve rural transport for the rural poor?', Transport and Communication Bulletin for Asia and the Pacific, 71.

Doob, C. B. (2013) Social inequality and social stratification in US society. London and New York: Pearson.

Drost, S., Wijk, J. van and Vellema, S. (2012) Linking theories of change and observed reality: the shea value chain partnership case in Burkina.

Duber-Smith, D. C. et al. (2012) 'Natural Cosmetics', Kirk-Othmer Encyclopedia of Chemical Technology. Hoboken, NJ, USA: John Wiley & Sons, Inc.

Dunaway, W. A. (2013) Gendered commodity chains: seeing women's work and households in global production. Edited by W. A. Dunaway.

Dunaway, W. A. (2014) 'Bringing Commodity Chain Analysis Back to Its World-Systems Roots: Rediscovering Women's Work and Households', Journal of World-Systems Research, 20(1), pp. 64–81.

Dunseith, B. (2018) Thailand's Eastern Economic Corridor – What You Need to Know - ASEAN Business News, ASEAN Briefing.

Durst, P. B. and Hanboonsong, Y. (2015) 'Small-scale production of edible insects for enhanced food security and rural livelihoods: experience from Thailand and Lao People's Democratic Republic', Journal of Insects as Food and Feed, 1(1), pp. 25–31.

Dwyer, S. C. and Buckle, J. L. (2009) 'The Space Between: On Being an Insider-Outsider in Qualitative Research', International Journal of Qualitative Methods, 8(1), pp. 54–63.

Earth, B. et al. (2008) 'Intensification regimes in village-based silk production, Northeast Thailand: Boosts (and Challenges) to women's authority.', in Resurrection, B. P. and Elmhirst, R. (eds) Gender and Natural Resource Management: Livelihoods, Mobility and Interventions. Earthscan, pp. 43–65.

Eastern Economic Corridor Office (EECO) (2018) Background | EEC.

Easton, K. L., McComish, J. F. and Greenberg, R. (2000) 'Avoiding Common Pitfalls in Qualitative Data Collection and Transcription', Qualitative Health Research, (5), pp. 703–707.

Eckhardt, G. M., Belk, R. and Devinney, T. M. (2010) 'Why don't consumers consume ethically?', Journal of Consumer Behaviour, 9(6), pp. 426–436.

Edwards, B. et al. (2000) Partnership working in rural regeneration: governance and empowerment? Bristol.

Eisenhardt, K. M. (1989) 'Building Theories from Case Study Research', The Academy of Management Review, 14(4), pp. 532–550.

Ekasingh, B. et al. (2008) The development of competitive commercial agriculture in Northeast Thailand, 1950-2006: Chiang Mai, Thailand.

Ergun, A. and Erdemir, A. (2010) 'Negotiating Insider and Outsider Identities in the Field: "Insider" in a Foreign Land; "Outsider" in One's Own Land', Field Methods, 22(1), pp. 16–38.

Eriksson, E. et al. (2009) 'Greywater pollution variability and loadings', Ecological Engineering, 35(5), pp. 661–669.

Eswarappa, K. (2011) 'Developmental initiatives and sericulture in South Indian village.', South Asia Research, 31(3), pp. 213–229.

Eswarappa, K. (2013) 'Role of Women in Sericulture and Community Development: A study from South Indian village.', SAGE Publications, Los Angeles, CA, 3(3).

Etebari, K. et al. (2007) 'Biochemical changes in haemolymph of silkworm larvae due to pyriproxyfen residue', Pesticide Biochemistry and Physiology, 88(1), pp. 14–19.

Etikan, I. (2016) 'Comparison of Convenience Sampling and Purposive Sampling', American Journal of Theoretical and Applied Statistics, 5(1), pp. 1–4.

EU-Thailand Small Projects Facility (2007) Value chain analysis for Thai home textiles silk sub-sector. Chiang Mai.

Eyring, V. et al. (2010) 'Transport impacts on atmosphere and climate: Shipping', Atmospheric Environment. Pergamon, 44(37), pp. 4735–4771.

Fabiani, C. et al. (1996) 'Treatment of waste water from silk degumming processes for protein recovery and water reuse.', Desalination, 105(1–2), pp. 1–9.

Fafchamps, M. and Minten, B. (2001) 'Social Capital and Agricultural Trade', American Journal of Agricultural Economics, 83(3), pp. 680–685.

Fahsai Gallery (no date) Chumtabong Sericin Soaps (in Thai).

Falvey, L. (2000) Thai agriculture: golden cradle of millennia. Kasetsart University Press.

Fan, S., Jitsuchon, S. and Methakunnavut, N. (2004) The importance of public investment for reducing rural poverty in middle-income countries: the case of Thailand. Washington.

Fay, B. (1996) Contemporary philosophy of social science: a multicultural approach. Blackwell.

Felício, J. A., Couto, E. and Caiado, J. (2012) 'Human capital and social capital in entrepreneurs and managers of small and medium enterprises', Journal of Business Economics and Management, 13(3), pp. 395–420.

Filep, B. (2009) 'Interview and translation strategies: coping with multilingual settings and data.', Social Geography, 4, pp. 59–70.

Fine, B. (1994) 'Towards a Political Economy of Food', Review of International Political Economy. Taylor & Francis, Ltd., pp. 519–545.

Fine, B. and Leopold, E. (1993) The world of consumption. London: Routledge.

Fink, A. and Kosecoff, J. (1998) How to conduct surveys: a step by step guide. 2nd edn. Thousand Oaks, California: SAGE Publications.

Finlay, L. (2002) 'Negotiating the swamp: the opportunity and challenge of reflexivity in research practice', Qualitative Research. Sage Publications, CA, 2(2), pp. 209–230.

Fischer, E. and Qaim, M. (2010) Linking smallholders to markets: determinants and impacts of farmer collective action in Kenya.

Fletcher, R. (2006) 'Reproductive consumption', Feminist Theory, 7(1), pp. 27–47.

Fontana, A. and Frey, J. (1994) 'Interviewing: the Art of Science', in Denzin, N. and Lincoln, Y. (eds) The Handbook of Qualitative Research. CA: Thousand Oaks: Sage, pp. 361–376.

Food and Agriculture Organization (FAO) (2002) Case study on education opportunities for hill tribes in Northern Thailand. Bangkok.

Food and Drug Administration of Thailand (2011) Government Gazette: Cosmetic labelling.

Forestier, A. (2010) 'Risk, kinship and personal relationships in late eighteenth-century West Indian trade: The commercial network of Tobin & Pinney', Business History. Routledge, 52(6), pp. 912–931.

Forstner, K. (2004) 'Community ventures and access to markets: the role of intermediaries in marketing rural tourism products.', Development Policy Review, 22(5), pp. 497–514.

Foster, R. J. (2006) 'Tracking globalization: Commodities and value in motion.', in Tilley, C. et al. (eds) Sage handbook of material culture. London: Sage, pp. 285–302.

Francke, I. C. M. and Castro, J. F. W. (2013) 'Carbon and water footprint analysis of a soap bar produced in Brazil by Natura Cosmetics', Water Resources and Industry, 1–2, pp. 37–48.

Fraser, E. D. G. et al. (2006) 'Bottom up and top down: Analysis of participatory processes for sustainability indicator identification as a pathway to community empowerment and sustainable environmental management', Journal of Environmental Management, 78(2), pp. 114–127.

Freddi, G., Mossotti, R. and Innocenti, R. (2003) 'Degumming of silk fabric with several proteases', Journal of Biotechnology, 106(1), pp. 101–112.

Garcia, A. R., Quaratesi, G. and Sincharoen, K. (2011) Study survey on successful implementation of voluntary and regulated requirements of EU single market available in food, textile, and cosmetics sectors in Thailand.

Genefke, J. and McDonald, F. (2001) Effective collaboration: managing the obstacles to success. 1st edn. Edited by F. McDonald and J. Genefke. Palgrave Macmillan.

Gereffi, G. (1994a) 'The international economy and economic development', in Smelser, N. J. and Sweldberg, R. (eds) The Handbook of Economic Sociology. Princeton: Princeton University Press.

Gereffi, G. (1994b) 'The organization of buyer-driven global commodity chains: how US retailers shape global production networks', in Commodity Chains and Global Capitalism. Gereffi, G. Westport, CT: Greenwood Press, pp. 95–122.

Gereffi, G. et al. (2001) 'Introduction: Globalisation, Value Chains and Development', IDS Bulletin. Wiley/Blackwell, 32(3), pp. 1–8.

Gereffi, G. (2014) 'Global value chains in a post-Washington Consensus world', Review of International Political Economy. Routledge, 21(1), pp. 9–37.

Gereffi, G., Humphrey, J. and Sturgeon, T. (2005) 'The Governance of Global Value Chains.', Review of International Political Economy. Taylor & Francis Group, 12(1), pp. 78–104.

Gereffi, G. and Korzeniewicz, M. (1994) Commodity Chains and Global Capitalism.

Gilliam, D. A. and Flaherty, K. E. (2015) 'Storytelling by the sales force and its effect on buyer–seller exchange', Industrial Marketing Management, 46, pp. 132–142.

Glaser, B. and Strauss, A. (1967) 'The discovery of grounded theory: Strategies for qualitative research',

Glassman, Ji. and Sneddon, C. (2003) 'Chiang Mai and Khon Kaen as Growth Poles: Regional Industrial Development in Thailand and Its Implications for Urban Sustainability', The Annals of the Americal Academy of Political and Social Science, pp. 93–115.

Godey, B. et al. (2012) 'Brand and country-of-origin effect on consumers' decision to purchase luxury products', Journal of Business Research, 65(10), pp. 1461–1470.

Goodenough, W. H. (1970) Description and comparison in cultural anthropology. Cambridge: Cambridge University Press.

Goodman, M. K., Goodman, D. and Redclift, M. (2012) Consuming Space: Placing Consumption in Perspective. Farham and Burlington: Ashgate Publishing, Ltd.

Goss, J. (2005) 'Consumption Geography', in Cloke, P., Crang, P., and Goodwin, M. (eds) Introducing human geographies. 2nd edn. Routledge, pp. 253–265.

Gottdiener, M. (1995) Postmodern Semiotics: Material culture and the forms of postmodern life. Oxford: Blackwell.

Government Savings Bank (GSB) (2018) Community development credit (in Thai).

Graham, M. (2008) New Silks Roads: Promises and Perils of the Internet in the Thai Silk Industry. University of Kentucky.

Graham, M. (2010) Justifying Virtual Presence in the Thai Silk Industry: Links Between Data and Discourse. Oxford.

Graham, M. (2011a) 'Disintermediation, altered chains and altered geographies: the internet in the Thai silk industry', Electronic Journal of Informationa Systems in Developing Countries, 45(5), pp. 1–25.

Graham, M. (2011b) '"Perish or globalize:" Network integration and the reproduction and replacement of weaving traditions in the Thai silk industry', An International E-Journal for Critical Geographics, 10(3), pp. 458–482.

Gramsci, A. (1971) Selection from the Prison Notebooks. London: Lawrence and Wishart.

Grand View Research (2018) Global Soap and Detergent Market Size | Industry Report, 2018-2025.

Greco, L. Del, Walop, W. and McCarthy, R. H. (1987) 'Questionnaire development: 2. Validity and reliability.', Clinical Epidemiology, 136.

Greene, J. C., Caracelli, V. J. and Graham, W. F. (1989) 'Toward a Conceptual Framework for Mixed-Method Evaluation Designs', Educational

Evaluation and Policy Analysis. American Educational Research Association, 11(3), p. 255.

Greer, J. (2001) 'Whither Partnership Governance in Northern Ireland?', Environment and Planning C: Government and Policy. SAGE Publications, London, 19(5), pp. 751–770.

Gregson, N. et al. (2010) 'Following things of rubbish value: End-of-life ships, "chock-chocky" furniture and the Bangladeshi middle class consumer', Geoforum, 41(6), pp. 846–854.

Gregson, N. and Crewe, L. (2003) Second-hand cultures. Oxford and New York.

Grewal, D. et al. (1998) 'The effect of store name, brand name and price discounts on consumers' evaluations and purchase intentions', Journal of Retailing, 74(3), pp. 331–352.

de Groot, R. S., Wilson, M. A. and Boumans, R. M. . (2002) 'A typology for the classification, description and valuation of ecosystem functions, goods and services', Ecological Economics, 41(3), pp. 393–408.

Gross, A. et al. (2008) 'Reliability of small scale greywater treatment systems and the impact of its effluent on soil properties', International Journal of Environmental Studies, 65(1), pp. 41–50.

Groves, R. M. (1990) 'Theories and Methods of Telephone Surveys', Annual Review of Sociology. Annual Reviews, 16(1), pp. 221–240.

Guba, E. G. and Lincoln, Y. S. (1989) Fourth generation evaluation. London: Sage Publications.

Gulrajani, M. L. (1988) 'Degumming of silk.', Silk dyeing printing and finishing. Edited by M. L. Gulrajani. New Delhi: Department of Textile Technology Indian Institute of Technology, 22, pp. 63–95.

Gulrajani, M. L. (1992) 'Degumming of silk.', Review of Progress in Coloration and Related Topics, 22.

Gupta, A., Hoopes, D. G. and Knott, A. M. (2015) 'Redesigning routines for replication', Strategic Management Journal, 36(6), pp. 851–871.

Ha, H.-Y. and Perks, H. (2005) 'Effects of consumer perceptions of brand experience on the web: Brand familiarity, satisfaction and brand trust.', Journal of Consumer Behaviour, 4(6), pp. 438–452.

Haberland, M. F. (2009) The power of scent: empirical field studies of olfactory cues on purchase behaviour. University of St. Gallen.

Hackethai, A. (2008) Silk making step 1: raising silkworms and harvesting cocoons, Design Boom.

Hacking, T. and Guthrie, P. (2008) 'A framework for clarifying the meaning of Triple Bottom-Line, Integrated, and Sustainability Assessment', Environmental Impact Assessment Review, 28(2–3), pp. 73–89.

Haggblade, S. and Ritchie, N. (1992) Opportunities for intervention in Thailand's silk subsector. Maryland.

Haines-Young, R. and Potschin, M. (2009) Methodologies for defining and assessing ecosystem services. Nottingham.

Halcomb, E. J., Cert, I. and Davidson, P. M. (2006) 'Is verbatim transcription of interview data always necessary?', Applied Nursing Research, 19, pp. 38–42.

Hall, J. M. and Stevens, P. E. (1991) 'Rigor in feminist research.', Advances in Nursing Science, 13(3), pp. 16–29.

Hamamura, Y. (1959) 'Food selection by silkworm larvae.', Nature, 183(4677), pp. 1746–7.

Hammersley, M. (1992) What's wrong with ethnography? Routledge.

Hammersley, M. and Atkinson, P. (2007) Ethnography: Principles in Practice. 3rd edn. London and New York: Routledge.

Hammond, J. (2011) Branding your business. London: Kogan Page.

Hanboonsong, Y. (2010) 'Edible insects and associated food habits in Thailand.', in Durst, P. B. et al. (eds) Edible Forest Insects: humans bite back. Bangkok: Food and Agriculture Organization of the United Nations.

Hannigan, J. (2007) 'Casino cities.', Geography Compass, pp. 959–975.

Hapke, H. M. (2001) 'Petty Traders, Gender, and Development in a South Indian Fishery*', Economic Geography, 77(3), pp. 225–249.

Hardaker, J. B. et al. (2004) Coping with risk in agriculture. Edited by J. B. Hardaker et al. Wallingford: CABI.

Harris, M. (2001) Cultural materialism: the struggle for a science of culture. California: AltaMira Press.

Harrison, B. (2006) 'Shopping to save: green consumerism and the struggle for northern Maine', Cultural Geographies, pp. 395–420.

Hartlieb, S. and Jones, B. (2009) 'Humanising Business Through Ethical Labelling: Progress and Paradoxes in the UK', Journal of Business Ethics, 88(3), pp. 583–600.

Hartwick, E. (1998) 'Geographies of Consumption: A Commodity-Chain Approach', Environment and Planning D: Society and Space. SAGE Publication: London, 16(4), pp. 423–437.

Hartwick, E. R. (2015) 'Commodity chains', International Encyclopedia of the Social & Behavioural Sciences, 4.

Harvey, D. (1990) 'Between Space and Time: Reflections on the Geographical Imagination', Annals of the Association of American Geographers. Wiley/Blackwell, 80(3), pp. 418–434.

Harvie, C. (2003) The contribution of micro-enterprises to economic recovery and poverty alleviation in East Asia.

Hassanein, M. H. and Shaawary, M. F. (1962) 'The nutritional value of certain mulberry varieties.', Journal of Silkworm, 14, pp. 211–260.

Hawkins, C. V. (2010) 'Competition and Cooperation: Local Government Joint Ventures for Economic Development', Journal of Urban Affairs, 32(2), pp. 253–275.

Hayami, Y., Kikuchi, M. and Marciano, E. . (1999) 'Middlemen and peasants in rice marketing in the Philippines', Agricultural Economics, 20(2), pp. 79–93.

Hedlund, J. and Mattero, K. (2018) When product attributes are not enough: A study of a Finnish cosmetics brand on the Swedish market. Uppsala University.

Hemalatha, A., Antony, V. and Sivanesan, G. (2014) 'A study of brand loyalty on toilet soaps buying behaviour of female consumers in Tiruchirappalli.', International Journal of Marketing and Human Resource Management, 5(5), pp. 11–21.

Henn, M., Weinstein, M. and Foard, N. (2006) A short introduction to social research. London: SAGE Publications.

Herod, A. et al. (2013) 'Waste, commodity fetishism and the ongoingness of economic life', Area, 45(3), pp. 376–382.

Herriott, R. E. and Firestone, W. A. (1983) 'Multisite Qualitative Policy Research: Optimizing Description and Generalizability', Educational Researcher, 12(2), pp. 14–19.

Herskovitz, S. and Crystal, M. (2010) 'The essential brand persona: storytelling and branding', Journal of Business Strategy, 31(3), pp. 21–28.

Hingley, M., Lindgreen, A. and Beverland, M. (2010) 'Barriers to network innovation in U.K Ethnic Fresh Produce Supply.', Entrepreneurship and Regional Development, 22(1), pp. 77–96.

Holbrook, A. L., Green, M. C. and Krosnick, J. A. (2003) 'Telephone versus Face-to-Face Interviewing of National Probability Samples with Long Questionnaires', Public Opinion Quarterly. Oxford University Press, 67(1), pp. 79–125.

Holdway, R., Walker, D. and Hilton, M. (2002) 'Eco-design and successful packaging', Design Management Journal (Former Series). Wiley/Blackwell, 13(4), pp. 45–53.

Hopkins, T. K. and Wallerstein, I. (1977) 'Patterns of Development of the Modern World-System', Review (Fernand Braudel Center). Research Foundation of State, University of New York, 1, pp. 111–145.

Hopkins, T. and Wallerstein, I. (1986) 'Commodity chains in the world economy prior to 1800.', Review, 10(1), pp. 157–170.

Howard, P. H. and Allen, P. (2006) 'Beyond organic: consumer interest in new labelling schemes in the Central Coast of California', International Journal of Consumer Studies, 30(5), pp. 439–451.

Hudson, I. and Hudson, M. (2003) 'Removing the veil?', Organization & Environment, 16(4), pp. 413–430.

Hughes, A. (2000) 'Retailers, knowledges and changing commodity networks: the case of the cut flower trade', Geoforum, 31(2), pp. 175–190.

Hughes, A. and Reimer, S. (2004) Geographies of commodity chains. Edited by A. Hughes and S. Reimer. London: Routledge.

Huirne, R. B. M. et al. (2000) 'Risk and risk management in agriculture: an overview and empirical results'.

Huzhou, X. (2013) Silk products, Silk Energy: Biotechnology & Technology.

Hwang, J. and Kandampully, J. (2012) 'The role of emotional aspects in younger consumer-brand relationships', Journal of Product & Brand Management, 21(2), pp. 98–108.

Hyett, N., Kenny, A. and Dickson-Swift, V. (2014) 'Methodology or method? A critical review of qualitative case study reports', International Journal of Qualitative Studies on Health and Well-being, 9(1), pp. 1–12.

IMARC (2017) Bath Soap Market | Share | Size | Global Analysis | Forecast 2018-2023.

Inserco (2013) Key components of the silk industry, International Sericultural Commission.

INSERCO (2013) Thai Sericulture.

Israel, M. and Hay, L. (2006) Research Ethics for Social Scientists. London: SAGE Publications.

Jacinto, E. R. and Pomeroy, R. (2011) 'Developing markets for small-scale fisheries: utilising the value chain approach', in Pomeroy, R. S. and Andrew, N. L. (eds) Small-scale fisheries management: frameworks and approaches for the developing world. Wallingford: CAB International.

Jackson, P. (1993) 'Towards a cultural politics of consumption.', in Bird, J. et al. (eds) Mapping the futures: Local cultures, global change. London: Routledge.

Jackson, P. (1999) 'Commodity Cultures: The Traffic in Things', Transactions of the Institute of British Geographers, 24(1), pp. 95–108.

Jackson, P. and Taylor, J. (1996) 'Geography and the cultural politics of advertising', Progress in Human Geography, 20(3), pp. 356–371.

Jaensirisak, S. et al. (2017) 'Development of national transport master plan in Thailand', Transport Research Procedia.

Jamal, A., Khan, M. S. and Tsesmetzi, M. S. (2009) 'Perceived Quality, Packaging and Self-Image Congruence: An Application in the Cosmetics Market', ACR North American Advances, 36, pp. 1019–1020.

Jamal, A., Khan, M. S. and Tsesmetzi, M. S. (2012) 'Information cues roles in product evaluations: the case of the UK cosmetics market', Journal of Strategic Marketing, 20(3), pp. 249–265.

Javali, U. C. et al. (2015) Developments in the use of silk by-product and silk waste., Advances in Silk Science and Technology. Elsevier.

Jewitt, S. (2000) 'Mothering earth? Gender and environmental protection in the Jharkhand, India', Journal of Peasant Studies, 27(2), pp. 94–131.

Jick, T. D. (1979) 'Mixing qualitative and quantitative methods: triangulation in action.', Administrative Science Quarterly, 24(4), pp. 602–611.

Jinachai, N., Anantachoti, P. and Winit-Watjana, W. (2016) 'Exploring competitiveness of Thailand's cosmetic industry using Porter's diamond model', Thai Journal of Pharmaceutical Sciences, 40(4), pp. 172–178.

Jitsanguan, T. (2001) Sustainable agricultural systems for small-scale farmers in Thailand: Implications for the Environment.

Jitsuchon, S. (1989) Alleviation of rural poverty in Thailand. Bangkok.

Jitsuchon, S. and Richter, K. (2006) Thailand's Poverty Maps: From construction to application.

Johnson, B. and Turner, L. A. (2003) 'Data collection strategies in mixed methods research.', in Tashakkori, A. and Teddlie, C. (eds) Handbook of Mixed Methods in Social & Behavioral Research. London: SAGE Publications.

Johnson, W. (2015) Safety assessment of silk proteins as used in cosmetics. Washington.

Johri, L. M. and Sahasakmontri, K. (1998) 'Green marketing of cosmetics and toiletries in Thailand', Journal of Consumer Marketing, 15(3), pp. 265–281.

Jolly, M. et al. (1979) Non-mulberry silks. Edited by G. Rangaswami et al. Rome, Italy: FAO of the United Nations.

Jory, P. (1999) 'Thai identity, globalisation, and advertising culture', Asian Studies Review, 23(4), pp. 461–487.

Joseph, B. and Raj, S. J. (2013) 'Therapeutic applications and properties of silk proteins from Bombyx mori', Frontiers in Life Science, 6(3–4), pp. 55–60.

Juska, A. and Busch, L. (1994) 'The Production of Knowledge and the Production of Commodities: The Case of Rapeseed Technoscience1', Rural Sociology, 59(4), pp. 581–597.

Kachondham, Y., Winichagoon, P. and Tontisirin, K. (1992) 'II. OVERVIEW OF THAILAND AND ECONOMIC PERFORMANCE', in Nutrition and Health in Thailand: Trends and Actions. Bangkok: Mahidol University.

Kahan, D. (2008) Managing risk in farming. Rome, Italy.

Kahn, B. E., Inman, J. J. and Verhoef, P. C. (2018) 'Introduction to Special Issue: Consumer Response to the Evolving Retailing Landscape', Journal of the Association for Consumer Research. University of Chicago, 3(3), pp. 255–259.

Kamtam, M. (2015) History of Chumtabong sericulture community. Nakhon Sawan province.

Kamtam, M. (no date) General information of Chumtabong community (unpublished report).

Kane, A. A., Argote, L. and Levine, J. M. (2005) 'Knowledge transfer between groups via personnel rotation: Effects of social identity and knowledge quality', Organizational Behaviour and Human Decision Processes. Academic Press, 96(1), pp. 56–71.

Kanuha, V. K. (2000) 'Being "Native" versus "Going Native": conducting social work research as an insider.', Social Work, 45(5), pp. 439–447.

Kasi, E. (2009) Anthropology and Development in a Globalized India: an Ethnography of Sericulture from the South. Cambridge Scholars Publishing.

Kasiviswanathan, K., Iyengar, M. and Krishnaswami, S. (1970) 'Effects of feeding leaves grown under different systems of mulberry cultivation on the silkworm cocoon crop.', Indian Journal of Sericulture, 9, pp. 53–58.

Katiyar, A. and Katiyar, N. (2014) 'An empirical study of Indian consumer buying behavior of FMCG products (with special reference of bathing soap)', International Journal of Management and Commerce Innovations, 2(1), pp. 211–217.

Kato, N. et al. (1998) 'Silk protein, sericin, inhibits lipid peroxidation and tyrosinase activity.', Bioscience, biotechnology, and biochemistry, 62(1), pp. 145–7.

Kauppinen, A.-R. and Spronk, R. (2014) 'Afro-chic: Beauty, ethics and "locks without read" in Ghana.', in Barendregt, B. and Jaffe, R. (eds) Green Consumption: The Global Rise of Eco-Chic. London: Bloomsbury Academic.

Kelly, M. et al. (2012) 'Development Policy in Thailand: From Top-down to Grass Roots.', Asian social science. Europe PMC Funders, 8(13), pp. 29–39.

Kemavuthanon, S. (2014) 'Leadership in the OVOP and Similar Movements: The Comparative Study Between the OVOP Movement in Japan and OTOP Project in Thailand', International Journal of Public Administration. Routledge, 37(9), pp. 542–555.

Khan, M. E. et al. (1991) 'The use of focus groups in social and behavioural research: some methodological issues.', World health statistics quarterly, 44(3), pp. 145–9.

Khong District Office (no date a) Khong district. Nakhon Ratchasima.

Khong District Office (no date b) Khong district profile. Nakhon Ratchasima.

Khraim, H. S. (2011) 'The influence of brand loyalty on cosmetics buying behaviour of UAE female consumers.', International Journal of Marketing Studies, 3(2), pp. 123–133.

Kim, G.-S., Lee, G. Y. and Park, K. (2010) 'A Cross-National Investigation on How Ethical Consumers Build Loyalty Toward Fair Trade Brands', Journal of Business Ethics, 96(4), pp. 589–611.

Kirk, J. and Miller, M. L. (1986) Reliability and validity in qualitative research. Sage Publications.

Kitisin, T., Maneekan, P. and Luplertlop, N. (2013) 'In-vitro Characterization of Silk Sericin as an Anti-aging Agent', Journal of Agricultural Science, 5(3), pp. 54–63.

Knafl, K. and Breitmayer, B. (1991) 'Triangulation in qualitative research: issues of conceptual clarity and purpose.', in Morse, J. (ed.) Qualitative nursing research: a contemporary dialogue. Sage Publications, pp. 226–239.

Knodel, J. and Saengtienchai, C. (2007) 'Rural parents with urban children: social and economic implications of migration for the rural elderly in Thailand', Population, Space and Place. Wiley-Blackwell, 13(3), pp. 193–210.

Kokkaew, N., Sunkpho, J. and Alexander, D. (2013) 'Thailand's New Public Private Partnership Law: A Cure to the Problem?', European Procurement & Public Private Partnership Law Review, 8(2), pp. 143–150.

Komatsu, K. (1975) 'Studies on dissolution behaviors and structural characteristics of silk sericin', Bull. Sericult. Exp. Sta., 26, pp. 135–256.

Kopytoff, I. (1986) 'The Cultural Biography of Things: Commoditization as Process', in The Social Life of Things: Commodities in Cultural Perspective, pp. 64–91.

Korgaonkar, P. et al. (2010) 'Product classifications, consumer characteristics, and patronage preference for online auction', Journal of Retailing and Consumer Services. Pergamon, 17(4), pp. 270–277.

Krishanswami, S. et al. (1973) Silkworm rearing Bulletin. Rome, Italy.

Krishna, K. S. (2012) Integrated weed management in mulberry and it's effect on silkworm rearing (bombyx mori l.). University of Agricultural Sciences Bangalore.

Krishnaswami, S. et al. (1971) 'Silkworm feeding trials for evaluating the quality of mulberry leaves as influenced by variety, spacing and nitrogen fertilization.', Indian Journal of Sericulture, 10, pp. 79–89.

Krishnaswami, S. et al. (1973) Manual of Sericulture Vol 2. Silkworm Rearing. Rome.

Krishnaswami, S., Noamani, K. R. and Asan, M. (1970) 'Studies on the quality mulberry leaves and silkworm cocoon crop production. Part I. Quality differences due to varieties.', Indian Journal of Sericulture, 9, pp. 1–10.

Krueathep, W. (2008) 'Collaborative network activities of Thai subnational governments: curren practices and future challenges', International Public Management Review, 9(2).

Kulkarni, M. and Nithyanand, S. (2012) 'Social influence and job choice decisions', Employee Relations. Emerald Group Publishing Limited, 35(2), pp. 139–156.

Kumaresan, P., Sinha, P. K. and Urs, S. R. (2007) 'Sericin: a versatile by-product', Indian Silk, 45(12), pp. 11–13.

Kumari, V., Priyadarshani, N. and Varma, M. C. (2013) 'Toxicity impact of Silk dye effluent on blood profile of Swiss albino mice Mus musculus.', Journal of Academia and Industrial Research, 2(1).

Kunz, R. I. et al. (2016) 'Silkworm Sericin: Properties and Biomedical Applications', BioMed Research International. Hindawi Publishing Corporation, 2016, pp. 1–19.

Kurokawa, K., Tembo, F. and Velde, D. W. (2010) Challenge for the OVOP Movement in Sub-Saharan Africa., Working Papers. 18. JICA Research Institute.

Kwon, I.-W. G. and Suh, T. (2004) 'Factors affecting the level of trust and commitment in supply chain relationships.', The Journal of Supply Chain Management.

Lackey, S. B., Freshwater, D. and Rupasingha, A. (2002) 'Factors Influencing Local Government Cooperation in Rural Areas: Evidence from the Tennessee Valley', Economic Development Quarterly. Sage Publications, CA, 16(2), pp. 138–154.

Laoharojanaphand, S. et al. (2016) 'The recent status of nuclear technology development in Thailand', E-Journal of Advanced Maintenance, 8(1).

Larkin, P. J., Dierckx de Casterlé, B. and Schotsmans, P. (2007) 'Multilingual Translation Issues in Qualitative Research', Qualitative Health Research, 17(4), pp. 468–476.

Latour, B. (1990) 'Technology is Society Made Durable', The Sociological Review. SAGE Publications: London, 38(1), pp. 103–131.

Lee, D. S. et al. (2010) 'Transport impacts on atmosphere and climate: Aviation', Atmospheric Environment. Pergamon, 44(37), pp. 4678–4734.

Lee, Y.-W. (1999) Silk reeling and testing manual. Food and Agriculture Organization of the United Nations.

Legay, J. M. (1958) 'Recent advances in silkworm nutrition.', Annual Review of Entomology, 3, pp. 75–86.

Lent, R. W. and Brown, S. D. (1996) 'Social Cognitive Approach to Career Development: An Overview', The Career Development Quarterly, 44(4), pp. 310–321.

Lepawsky, J. and Mather, C. (2011) 'From beginnings and endings to boundaries and edges: rethinking circulation and exchange through electronic waste', Area, 43(3), pp. 242–249.

Leslie, D. and Reimer, S. (1999) 'Spatializing commodity chains', Progress in Human Geography, 23(3), pp. 401–420.

Lewis, D. (1973) 'Anthropology and colonialism.', Current Anthropology, 14(5).

Van Lieshout, K. G. et al. (2015) 'Leveraging Life Cycle Assessment to Evaluate Environmental Impacts of Green Cleaning Products', Procedia CIRP. Elsevier, 29, pp. 372–377.

Lincoln, Y. S. and Guba, E. G. (1985) Naturalistic inquiry. Sage Publications.

Lo, M. S. (2013) 'Confidant par excellence, advisors and healers: women traders' intersecting identities and roles in Senegal', Culture, Health & Sexuality. Routledge, 15(4), pp. 467–481.

Lockie, S. and Kitto, S. (2000) 'Beyond the Farm Gate: Production-Consumption Networks and Agri-Food Research', Sociologia Ruralis, 40(1), pp. 3–19.

De Long, D. W. and Fahey, L. (2000) 'Diagnosing cultural barriers to knowledge management.', Academy of Management Perspectives. Academy of Management Briarcliff Manor, NY 10510, 14(4), pp. 113–127.

Long, T. and Johnson, M. (2000) 'Rigour, reliability and validity in qualitative research', Clinical Effectiveness in Nursing, 4(1), pp. 30–37.

Looney, R. (2004) 'Thaksinomics: A new Asian paradigm.', The Journal of Social, Political and Economic Studies, 29(1), pp. 65–82.

Lopez, G. I. et al. (2008) 'Translation Barriers in Conducting Qualitative Research With Spanish Speakers', Qualitative Health Research, 18(12), pp. 1729–1737.

Lorenzo, T. and Motau, J. (2014) 'A Transect Walk to Establish Opportunities and Challenges for Youth with Disabilities in Winterveldt, South Africa', Disability, CBR & Inclusive Development, 25(3), pp. 45–63.

Lorjeerachunkun, W. and Jitratawate, J. (2012) 'Developing index and indicators for sustianable development at the regional level of Thailand', Development Economic Review, (1).

Lovett, P. (2004) The Shea Butter Value Chain: Production, Transformation and Marketing in West Africa.

MacLean, L. M., Meyer, M. and Estable, A. (2004) 'Improving Accuracy of Transcripts in Qualitative Research', Qualitative Health Research, 14(1), pp. 113–123.

Mahalingam, S. and Kumar, N. (2012) 'A study on consumer behaviour towards selected fast moving consumer goods in Coimbatore city.', Indian Journal of Education and Information Management, 1(11).

Mansvelt, J. (2005) Geographies of Consumption. London: SAGE Publications.

Mansvelt, J. (2008) 'Geographies of consumption: citizenship, space and practice', Progress in Human Geography, 32(1), pp. 105–117.

Mansvelt, J. (2010) 'Geographies of consumption: engaging with absent presences', Progress in Human Geography, 34(2), pp. 224–233.

Mansvelt, J. (2014) 'Consumption-Reproduction', in Cloke, P., Crang, P., and Goodwin, M. (eds) Introducing human geographies. 3rd edn. London and New York: Routledge, pp. 378–390.

Mapcoordinates.net (2016) Google Maps - Find GPS coordinates, longitude, latitude, altitude.

Marella, S. (2013) 'Scenario of sericulture in countries across the world', Journal of Biological and Chemistry Research, 30(2), pp. 959–990.
Markelova, H. and Meinzen-Dick, R. (2009) 'Collective action for smallholder market access', Food Policy, 34(1), pp. 1–7.
Marx, K. (1976) Capital. Volume 1. Harmondsworth: Penguin Books.
Mather, C. (2015) Consumption, Geography of. 2nd edn, International Encyclopedia of the Social & Behavioural Sciences. 2nd edn. Elsevier.
Mawdsley, J. K. and Somaya, D. (2016) 'Employee Mobility and Organizational Outcomes', Journal of Management. SAGE, 42(1), pp. 85–113.
McCracken, G. (1988) Culture and consumption: new approaches to the symbolic character of consumer goods and activities. Broomington: Indiana University Press.
McRobbie, A. (1997) 'Bridging the Gap: Feminism, Fashion and Consumption', Feminist Review. Nature Publishing Group, 55(1), pp. 73–89.
Meesilpa, P. et al. (2004) 'Silk soap comprising sericin protein'.
Merriam, S. B. et al. (2001) 'Power and positionality: negotiating insider/ outsider status within and across cultures.', International Journal of Lifelong Education, 20(5), pp. 405–416.
Merriam, S. B. (2009) Qualitative research: a guide to design and implementation. San Francisco: Jossey-Bass.
Miles, M. B. and Huberman, A. M. (1994) Qualitative data analysis: an expanded sourcebook. 2nd edn. Sage Publications.
Miles, M. B., Huberman, A. M. and Saldaña, J. (2014) Qualitative data analysis : a methods sourcebook. 3rd edn. California: SAGE Publications.
Millennium Ecosystem Assessment (MEA) (2003) Ecosystems and human well-being: a framework for assessment. Washington, DC.: Island Press.
MOAC (2005) Small and micro community enterprise promotion Act 2005 (in Thai).
Ministry of Education (2008) The development and state of the art of adult learning and education (ALE). Bangkok.
Ministry of Natural Resources and Environment (2005) Thailand National report on the implementation of the Convention on Biological Diversity.
MOST (2013) Technology transfer for using natural dye colour from plants and creating value added from silk glue (in Thai).
MOST (2014) Non-chemical sericulture village: Baan Huaysai.
MOST (2015a) Green sericulture community: Baan Huay Sai (in Thai).
MOST (2015b) Science Hit: Green sericulture community at Huaysai village.

MOST (2016) Heads of science and technology villages (in Thai).
MOST (2017) Thailand Institute of Nuclear Technology (Public Organisation) (TINT).
MOST (no date a) Achievement of Clinic Technology (in Thai).
MOST (no date b) Clinic Technology Background.
Miraftab, F. (2004) 'Public-Private Partnerships', Journal of Planning Education and Research, 24(1), pp. 89–101.
Misra, R. K., Patel, J. H. and Baxi, V. R. (2010) 'Reuse potential of laundry greywater for irrigation based on growth, water and nutrient use of tomato', Journal of Hydrology, 386(1–4), pp. 95–102.
MOAC (no date) Nayaw-NaUdom Sericulture community Enterprise (in Thai).
Mohamed, R. M. S. R. et al. (2013) 'A monitoring of environmental effects from household greywater reuse for garden irrigation', Environmental Monitoring and Assessment, 185(10), pp. 8473–8488.
Mohd Yasin, N., Nasser Noor, M. and Mohamad, O. (2007) 'Does image of country-of-origin matter to brand equity?', Journal of Product & Brand Management, 16(1), pp. 38–48.
Molony, T. (2008) 'Running out of credit : the limitations of mobile telephony in a Tanzanian agricultural marketing system.', Journal of Modern African Studies, 46(4), pp. 637–658.
Mondal, M., Trivedy, K. and Kumar, N. (2007) 'The Silk Proteins, Sericin and Fibroin in Silkworm, Bombyx mori Linn., - a review', Caspian Journal of Environmental Sciences, 5(2), pp. 63–76.
Mora, P. and Livat, F. (2013) 'Does storytelling add value to fine Bordeaux wines?', Wine Economics and Policy, 2(1), pp. 3–10.
Morris, M. W. et al. (1999) 'Views from inside and outside: integrating emic and etic insights about culture and justice judgment.', Academy of Management Review, 24(4), pp. 781–796.
Morris, P. and Therivel, R. (2001) Methods of environmental impact assessment. Spon Press.
Morrison, S. and Crane, F. G. (2007) 'Building the service brand by creating and managing an emotional brand experience', Journal of Brand Management, 14(5), pp. 410–421.
Morse, J. M. (2003) 'Principles of mixed methods and multimethod research design.', in Tashakkori, A. and Teddlie, C. (eds) Handbook of Mixed Methods in Social & Behavioural Research. SAGE Publications.
Morton, A. (1989) 'Thailand's million-dollar moth', New Scientist.

Moseley, M. J. (2003) Local partnerships for rural development: the European experience. Edited by M. J. Moseley. Oxon: CABI Publishing.

Mosier, C. I. (1947) 'A Critical Examination of the Concepts of Face Validity', Educational and Psychological Measurement, 7(2), pp. 191–205.

MOST (Ministry of Science and Technology) (no date a) Clinic Technology Data Center (in Thai).

MOST (Ministry of Science and Technology) (no date b) Technology Transfer from Clinic Technology (in Thai).

Munck, V. C. De and Sobo, E. J. (1998) Using Methods in the Field: A Practical Introduction and Casebook. Oxford: AltaMira Press.

Munhoz, R. E. F. et al. (2013) 'Evaluation of the toxic effect of insecticide chlorantraniliprole on the silkworm (Lepidoptera: Bombycidae)', Open Journal of Animal Sciences, 03(04), pp. 343–353.

Murdoch, J. (1997) 'Towards a geography of heterogeneous associations', Progress in Human Geography. Sage Publications, 21(3), pp. 321–337.

Murdoch, J. (2000) 'Networks — a new paradigm of rural development?', Journal of Rural Studies. Pergamon, 16(4), pp. 407–419.

Musser, W. N. and Patrick, G. F. (2002) 'How Much does Risk Really Matter to Farmers?', in A Comprehensive Assessment of the Role of Risk in U.S. Agriculture. Boston, MA: Springer US, pp. 537–556.

Mustafa, N. E. M. and Ahmed, G. E. A. (2014) 'Health Impacts of Soap Industry Effluents: Case Study of Soap Collectors at Alfatah District, Omdurman Sudan.', in Anwar, S. A. (ed.) 5th Health and Environment Conference in the Middle East: Transformation for Better Healthcare and Environment. Dubai: Hamdan Bin Mohammed Smart University.

Mustafaev, A. S. (1968) 'Study on the effect of leaf quality of experimentally obtained triploid mulberry forms on the biological indices of Chinese silkworm.', Doklady Akademii Nauk Azerbaidzhana, 22, pp. 49–54.

Nadiger, G. S. and Bhat, N. V. (1985) 'Investigation of amino acid composition in the crystallne region of silk fibroin.', Journal of Applied Polymer Science, 30, pp. 221–225.

Naenna, P. (1984) Thai Textiles: Threads of a Cultural Heritage. Bangkok.

Nahm, D. and Sutmmakid, N. (2003) 'Efficiency of agricultural production in the central region of Thailand', Korea Review of International Studies.

Narayana, E. S., Kasiviswanathan, K. and Iyengar, M. N. S. (1967) 'Preliminary observation on the effect of feeding leaves of varying maturity on the larval development and cocoon characters of Bombyx mori L.', Indian Journal of Sericulture, 6, pp. 109–113.

Nations Online (2018) Political map of Thailand.
Natsuda, K. et al. (2012) 'One Village One Product – rural development strategy in Asia: the case of OTOP in Thailand', Canadian Journal of Development Studies. Routledge, 33(3), pp. 369–385.
Nawir, A. A. and Santoso, L. (2005) 'Mutually beneficial company-community partnerships in plantation development: emerging lessons from Indonesia', International Forestry Review, 7(3).
Neal, L. (2014) Rural Thai community creates value from waste, Impact Journalism Day.
Neilson, J. (2014) 'Value chains, neoliberalism and development practice: The Indonesian experience', Review of International Political Economy. Routledge, 21(1), pp. 38–69.
New Directions Aromatics (NDA) (2015) Silk Powder.
Nguyen, T. and Eiligmann, A. (2010) Value chain study for sericulture in Phu Tho, Hoa Binh, Thanh Hoa and Nghe An, Vietnam.
Nhong Manaw Sub-district Administrative Organisation (2013) Sufficiency Economy Village: Huaysai village. Nakhon Ratchasima.
Nhong Manaw Sub-district Administrative Organisation (2015) Huaysai community development plan. Nakhon Sawan province.
Nhonghong Agriculture Organisation (2005) Agriculture Development plan. Buriram.
Nicholls, A. and Opal, C. (2005) Fair trade : market-driven ethical consumption. SAGE.
Nilvarangkul, K. et al. (2006) 'Strengthening the Self-Care of Women Working in the Informal Sector: Local Fabric Weaving in Khon Kaen, Thailand (Phase I)', Industrial Health, 44, pp. 101–107.
Noble, G. (2008) 'Living with things: consumption, material culture and everyday life.', in Anderson, N. and Schlunke, K. (eds) Cultural theory in everyday practice. Melbourne: Oxford University Press, pp. 98–113.
Noble, H. and Smith, J. (2015) 'Issues of validity and reliability in qualitative research.', Evidence-based nursing. Royal College of Nursing, 18(2), pp. 34–5.
Nontume Craftmanship group (2015) Silk protein soap Facebook Fanpage.
Novakovic, A. and Fouad, N. A. (2013) 'Background, Personal, and Environmental Influences on the Career Planning of Adolescent Girls', Journal of Career Development, 40(3), pp. 223–244.
NSTDA (2014) Collections of cosmeceutical data (in Thai).

O'Mahony, M. et al. (2002) Scope of Transport Impacts on the Environment: Final Report. Wexford.

Ödlund, A. (2010) 'Pulling the same way? A multi-perspectivist study of crisis cooperation in government.', Journal of Contingencies and Crisis Management, 18(2).

OECD (2000) Income risk management in agriculture.

OECD (2013) Structural policy country notes: Thailand.

Office of the U.S. Trade Representative (2005) Interim environment review: United States-Thailand Free Trade Agreement.

Official Statistics Thailand (2018) Indicators of sustainable development goals (in Thai).

Oguoma, O., Nkwocha, V. and Ibeawuchi, I. (2011) 'Implications of middlemen in the supply chain of agricultural products', Journal of Agriculture and Social Research (JASR), 10(2).

Ohno, A. and Jirapatpimol, B. (1998) 'The rural garment and weaving industries in Northern Thailand', in Hayami, Y. (ed.) Washington, DC.: The World Bank, pp. 131–159.

Onwuegbuzie, A. J. and Collins, K. M. (2007) 'A Typology of Mixed Methods Sampling Designs in Social Science Research.', The Qualitative Report, 12(2), pp. 281–316.

Opdenakker, R. (2006) 'Advantages and Disadvantages of Four Interview Techniques in Qualitative Research.', Forum: Qualitative Social Research, 7(4).

Overå, R. (1998) Partners and competitors: gendered entrepreneurship in Ghanaian canoe fisheries. Bergen: Department of Geography, University of Bergen.

Owusu, G. and Lund, R. (2004) 'Markets and women's trade: exploring their role in district development in Ghana', Norwegian Journal of Geography, 58(3), pp. 113–124.

Padamwar, M. N. et al. (2005) 'Silk sericin as a moisturizer: an in vivo study.', Journal of cosmetic dermatology, 4(4), pp. 250–7.

Padamwar, M. N. and Pawar, A. P. (2004) 'Silk sericin and its applications: A review', Journal of Scientific & Industrial Research, 63, pp. 323–329.

Palaganas, E. C. et al. (2017) 'Reflexivity in qualitative research: a journey of learning.', The Qualitative Report, 22(2), pp. 426–438.

Paris, T. R. et al. (2009) Labour out migration on rice farming households and gender roles: synthesis of findings in Thailand, the Philippines and Vietnam.

Park, C.-H. and Kim, Y.-G. (2003) 'Identifying key factors affecting consumer purchase behavior in an online shopping context.', International Journal of Retail & Distribution Managment, 31(1), pp. 16–29.

Park, H.-H. et al. (2008) 'Flavonoids inhibit histamine release and expression of proinflammatory cytokines in mast cells', Archives of Pharmacal Research, 31(10), pp. 1303–1311.

Park, K.-H. et al. (2007) 'Relationship between the non-spinning syndrome of silkworm, Bombyx mori and pesticides.', The Korean Journal of Pesticide Science, 11(4), pp. 238–245.

Parnwell, M. J. G. (1988) 'Rural poverty, development and the environment: the case of North-East Thailand.', Journal of Biogeography, 15, pp. 199–208.

Parnwell, M. J. G. (1986) 'Migration and the development of agriculture: a case study of North-East Thailand.', in Parnwell, M. (ed.) Rural development in North-East Thailand: case studies of migration, irrigation and rural credit. University of Hull, pp. 93–140.

Parsons, A. G. (2009) 'Use of scent in a naturally odourless store', International Journal of Retail & Distribution Management. Emerald Group Publishing Limited, 37(5), pp. 440–452.

Paterson, M. (2013) 'Commodification', in Death, C. (ed.) Critical Environmental Politics. Routledge, pp. 53–62.

Patichol, P., Wongsurawat, W. and Johri, L. M. (2014a) Modernizing tradition – the Thai silk industry. Emerald Group Publishing Limited.

Patichol, P., Wongsurawat, W. and Johri, L. M. (2014b) 'Upgrade strategies in the Thai silk industry: balancing value promotion and cultural heritage', Journal of Fashion Marketing and Management, 18(1), pp. 20–35.

Patil, B. R. et al. (2009) Sericulture: An Alternative Source of Income to Enhance the Livelihoods of Small-scale Farmers and Tribal Communities.

Patwardhan, M., Flora, P. and Gupta, A. (2010) 'Identification of Secondary Factors that Influence Consumer's Buying Behaviour for Soaps and Chocolates.', Journal of Marketing Management, 9(1/2), pp. 55–72.

Payanun, K. (1995) 'Sericulture development in Thailand', Kasetsart Journal - Social Science, 16, pp. 92–104.

Peet, R. and Watts, M. (1996) Liberation ecologies: environment, development and social movements. London: Routledge.

Peterson, M. (2018) Consumption and everyday life. 2nd edn. Oxon: Routledge.

Pinstrup-Andersen, P. and Shimokawa, S. (2008) 'Rural infrastructure and agricultural development', in Bourguignon, F. and Pleskovic, B. (eds)

Rethinking Infrastructure for Development. Washington, DC.: The World Bank.

Pintér, L. et al. (2012) 'Bellagio STAMP: Principles for sustainability assessment and measurement', Ecological Indicators, 17, pp. 20–28.

Poedi, A. et al. (no date) Utilisation of wood vinegar for pest control in mulberry (in Thai).

Poland, B. D. (1995) 'Transcription quality as an aspect of rigor in qualitative research.', Qualitative Inquiry, 1(3), pp. 290–310.

Polmart, K. (2016) NaUdom Community Development Plan. Buriram.

Pongsiri, N. (2003) 'Public-Private Partnerships in Thailand: A Case Study of the Electric Utility Industry', Public Policy and Administration, 18(3), pp. 69–90.

Pope, J. and Grace, W. (2006) 'Sustainable assessmetn in context: issues of process, policy and governance', Journal of Environmental Assessment Policy and Management, 8(03), pp. 373–398.

Porter, G. (2014) 'Transport Services and Their Impact on Poverty and Growth in Rural Sub-Saharan Africa: A Review of Recent Research and Future Research Needs', Transport Reviews, 34(1), pp. 25–45.

Porter, M. E. (1990) The Competitive Advantage of Nations. New York: MacMillan.

Potschin, M. B. and Haines-Young, R. (2011) 'Ecosystem services: exploring a geographical perspective.', Progress in Physical Geography, 35(5), pp. 575–594.

Pottier, J. (1992) 'Agrarian change at the household level: A note on investigative styles in research on Mambwe Agriculture (Northern Zambia).', in Kaarsholm, P. (ed.) Institutions, Culture and Change at Local Community Level. Internatio. Rosklide, Denmark: Rosklide University Centre, pp. 61–74.

Powell, W. and Smith-Doerr, L. (1994) 'Networks and economic life', in Smelser, N. and Swedberg, R. (eds) The Handbook of Economic Sociology. New Jersey and New York: Princeton University Press and Russell Sage Foundation, pp. 368–402.

Practical Action (2012) Core Guidance Note A: The Market Map.

Prasad, S. and Tata, J. (2010) 'Micro-enterprise supply chain management in developing countries.', Journal of Advances in Management Research, 7(1), pp. 8–31.

PWC (2018) Infrastructure developments and public private partnerships in Thailand: a 2018 update.

Punch, K. F. (2005) Introduction to social research: quantitative and qualitative approaches. 2nd edn. London: SAGE Publications.

Punpanishgul, T. (2002) A study on impact of marketing mix on purchasing decision on body liquid soap. Assumption University, Thailand.

Quader, M. A. (1987) 'Importance of mulberry leaf selection for silkworm rearing (in Bengali).', Krishi Katha, 7, pp. 347–349.

Quader, M. A. and Bari, M. A. (1989) 'Comparative study of leaf protein from different mulberry varieties.', Bangladesh Journal of Agriculture, 14, pp. 85–88.

QSDS (2014) Sericulture statistics data (in Thai).

QSDS (2013) Silk (in Thai).

QSDS (no date a) Silkworm rearing techniques (in Thai).

QSDS (no date b) Silkworm Varieties in Thailand (in Thai).

Rahmathulla, V. K. (2012) 'Management of climatic factors for successful silkworm (Bombyx mori L.) crop and higher silk production: A review', Psyche.

Raikes, P., Friis Jensen, M. and Ponte, S. (2000) 'Global commodity chain analysis and the French filière approach: comparison and critique', Economy and Society, 29(3), pp. 390–417.

Rief, Y. M. and Cochrane, S. H. (1990) 'The Off-Farm Labour Supply of Farmers: The Case of the Chiang Mai Valley of Thailand', Economic Development and Cultural Change, 38(4), pp. 683–698.

Ritchie, J. and Lewis, J. (2003) Qualitative Research Practice: A guide for social science students and researchers. Edited by J. Ritchie and J. Lewis. London: SAGE Publications.

Roberts, J. A. (1996) 'Will the real socially responsible consumer please step forward?', Business Horizons. Elsevier, 39(1), pp. 79–83.

Robson, C. (2011) Real World Research. Wiley.

Robson, R. M. (1985) 'Silk composition, structure and properties', in Lewin, M. and Pearce, E. M. (eds) Handbook of Fibre Science and Technology. IV. New York.

Rockwood, D. N. et al. (2011) 'Materials fabrication from Bombyx mori silk fibroin.', Nature protocols, 6(10), pp. 1612–31.

Rola, A. C. et al. (1993) Pesticides, rice productivity, and farmers' health: an economic assessment. International Rice Research Institute.

Rosenkopf, L. and Almeida, P. (2003) 'Overcoming Local Search Through Alliances and Mobility', Management Science, 49(6), pp. 751–766.

Rossman, G. B. and Wilson, B. L. (1985) 'Numbers and Words', Evaluation Review, 9(5), pp. 627–643.

Routray, J. K. (2007) 'One Village One Product - Strategy for sustainable rural development in Thailand.', CAB Calling.

Ruengdet, K. and Wonsurawat, W. (2010) 'Characteristics of successful small and micro community enterprises in rural Thailand', Journal of Agricultural Education and Extension, 16(4), pp. 385–397.

SAB Miller, Business Fights Poverty and Harvard Kennedy School (2016) Growing together: strengthening micro-enterprises in value chains.

Sadov, F., Korchagin, M. and Matetsky, A. (1987) Chemical technology of fibrous materials. Moscow: Mir Publication.

Saguin, K. (2014) 'Biographies of fish for the city: Urban metabolism of Laguna Lake aquaculture', Geoforum, 54, pp. 28–38.

Sakthivel, N. et al. (2014) Organic farming in Mulberry: Recent breakthrough. Tamil Nadu, India: Central Silk Board, Ministry of Textiles, India.

Salem, M. Z. (2018) 'Effects of perfume packaging on Basque female consumers purchase decision in Spain', Management Decision, 56(8), pp. 1748–1768.

Salzinger, L. (2003) Genders in production: making workers in Mexico's global factories. University of California Press.

Santitaweeroek, Y. (2008) Understanding and Improving the Sustainability of the Silk Cottage Industry in Thailand: Applying Sufficiency Economy Philosophy and Sustainable Approaches. University of Surrey.

Santos-Granero, F. (2007) 'Of fear and friendship: Amazonian sociality beyond kinship and affinity', Journal of the Royal Anthropological Institute,13(1), pp. 1–18.

Santoso, B. et al. (2005) The Need and Availability of Micro Finance Service for Micro Enterprise: Bringing Multi-Level Good Practices into Local Context.

Saodeaw subdistrict Administrative Organisation (SAO) (2016) General information of Saodeaw subdistrict (in Thai).

Saouter, E. and van Hoof, G. (2002) 'A database for the life-cycle assessment of procter & gamble laundry detergents', The International Journal of Life Cycle Assessment, 7(2), pp. 103–114.

Sarma, M. S. and Pratap, R. (2011) 'Brand loyalty and satisfaction towards toilet soaps: a study of urban consumers in Warangal District.', Foundation for Organisational Research & Education, 29(3).

Sarovart, S. et al. (2003) 'The use of sericin as an antioxidant and antimicrobial for polluted air treatment', Reviews of Advanced Material Science, pp. 193–198.

Sawasdee, K., Yodmalee, B. and Phaengsoi, K. (2015) 'Silk Patterns: Conservation and Development of Traditional Thai silk Production for Added Commercial Value in Khon Kaen Province.', Asian Culture and History, 7(1).

Schein, E. H. (1984) 'Culture as an environmental context for careers', Journal of Organizational Behaviour, 5(1), pp. 71–81.

Schmidt, J. and Ruiz, J. (1996) 'Cultural barriers to effective trade between the United States and Latin America.', in Grammy, A. P. and Bragg, K. (eds) United States-Third World Relations in the New World Order. New York: Nova Science Publishers.

SDG MOVE THAILAND (2016) Indicators of sustainable development for Thailand (in Thai).

Seixas, C. S. and Berkes, F. (2010) 'Community-based enterprises: The significance of partnerships and institutional linkages', International Journal of the Commons, 4(1), p. 183.

Selnes, F. (1993) 'An Examination of the Effect of Product Performance on Brand Reputation, Satisfaction and Loyalty', European Journal of Marketing, 27(9), pp. 19–35.

Setboonsarng, S. (2002) 'Gender division of labour in integrated agriculture/aquaculture of Northeast Thailand.', in Edwards, P., Little, D. C., and Demaine, H. (eds) Rural Aquaculture. Oxon: CABI Publishing, pp. 253–274.

Shah, S. (2005) 'Voices and choices: how education influences the career choices of young disabled people', Journal of Research in Special Educational Needs, 5(3), pp. 112–117.

Shanmugapriya, G. and Sethuraman, R. (2014) 'Consumers' satisfaction towards Hamam soap in Thanjavur town.', International Journal of Engineering and Management Sciences, 5(2), pp. 122–127.

Shekhar, S. K. and Raveendran, P. T. (2013) 'Role of packaging cues on consumer buying behaviour.', International Journal of Engineering and Managment Sciences, 4(1), pp. 61–69.

Siewsamdangdet, P., Vemuri, S. and Bretherton, P. (2010) 'Strategies for sustainable development of silk industry in Northeast Thailand', International Journal of Strategic Management, 10(1), pp. 1–11.

Sikod, F. (2007) 'Gender division of labour and women's decision-making power in rural households in Cameroon', Africa Development, 32(3), pp. 58–71.

Silayoi, P. and Speece, M. (2004) 'Packaging and purchase decisions', British Food Journal, 106(8), pp. 607–628.

Silayoi, P. and Speece, M. (2007) 'The importance of packaging attributes: a conjoint analysis approach', European Journal of Marketing, 41(11/12), pp. 1495–1517.

Silcock, T. H. (1970) The Economic Development of Thai Agriculture. Canberra: Australian National University Press.

Silva, V. R. et al. (2012) 'High Molecular Weight Sericin Obtained by High Temperature and Ultrafiltration Process', Procedia Engineering. Elsevier, 42, pp. 833–841.

Sinclair, A. J. and Diduck, A. P. (2001) 'Public involvement in EA in Canada: a transformative learning perspective', Environmental Impact Assessment Review, 21(2), pp. 113–136.

Singha, S. (1989) 'Development impact of silk promotion: a wealth of opportunities', Economic and Political Weekly, 24(3), pp. 157–163.

Singhanetra-Renard, A. (1999) 'Population mobility and the transformation of a village community in Northern Thailand', Asia Pacific Viewpoint, 40(1), pp. 69–87.

Singley, M. K. and Anderson, J. R. (1989) The transfer of cognitive skill. London: Harvard University Press.

Sittitoon, N. et al. (2015) 'Environmental Impact From Wastewater Effluent Of The Silk Cottage Industry: A Case Study Of Pak Thohg Chai, Nakhon Ratchasima, Thailand.', in Proceedings on the 14th International Conference on Environmental Science and Technology Rodes, Greece.

Sjögersten, S. et al. (2013) 'Responses to climate change and farming policies by rural communities in northern China: A report on field observation and farmers' perception in dryland north Shaanxi and Ningxia', Land Use Policy, 32, pp. 125–133.

Soares, A. M. (2004) The influence of culture and consumers: exploratory and risk taking behaviour. University of Minho.

Somtrakool, K. (2002) 'Lifelong learning for a modern learning society', in Medel-Añonuevo, C. (ed.) Integrating Lifelong Learning Perspectives. UNESCO Institute for Education.

Sovacool, B. K. (2013) 'Confronting energy poverty behind the bamboo curtain: A review of challenges and solutions for Myanmar (Burma)', Energy for Sustainable Development, 17(4), pp. 305–314.

Spangenberg, E. R., Crowley, A. E. and Henderson, P. W. (1996) 'Improving the Store Environment: Do Olfactory Cues Affect Evaluations and Behaviors?', Journal of Marketing, 60(2), p. 67.

Spangenberg, J. H. and Lorek, S. (2002) 'Environmentally sustainable household consumption: From aggregate environmental pressures to priority fields of action', Ecological Economics, 43(2–3), pp. 127–140.

Srimongkol, K. and Marten, G. (1986) 'Traditional agriculture in Northern Thailand', in Marten, G. G. (ed.) Traditional Agriculture in Southeast Asia1. Westview Press, pp. 85–102.

Van Staden, D. et al. (2006) A transect walk undertaken in Itereleng informal settlement to observe community vulnerability (Unpublished report). Pretoria: City of Tshwane.

Stake, R. (1995) The art of case study research. CA: SAGE Publications.

Stanley, J. and Preetha, G. (2016) 'Pesticide Toxicity to Silkworms: Exposure, Toxicity and Risk Assessment Methodologies', in Pesticide Toxicity to Non-target Organisms, pp. 229–275.

Stephens, N. (2007) 'Collecting data from elites and ultra elites: telephone and face-to-face interviews with macroeconomists', Qualitative Research, 7(2), pp. 203–216.

Stone, D. L., Isenhour, L. and Lukaszewski, K. M. (2008) 'A model of the influence of cultural values on job application intentions and behaviours.', in Stone, D. L. and Stone-Romero, E. F. (eds) The influence of culture on human resource management processes and practices. New York: Psych Press, pp. 25–52.

Sturges, J. E. and Hanrahan, K. J. (2004) 'Comparing Telephone and Face-to-Face Qualitative Interviewing: A Research Note', Qualitative Research. SAGE Publications, 4(1), pp. 107–118.

Subrahmanyan, S. and Tomas Gomez-Arias, J. (2008) 'Integrated approach to understanding consumer behaviour at bottom of pyramid.', Journal of Consumer Marketing, 25(7), pp. 402–412.

Subramani, M. and Walden, E. (2001) 'The impact of e-commerce announcements on the market value of firms', Information Systems Research. INFORMS Inst. for Operations Res. and the Management Sciences, 12(2), pp. 135–154.

Subramani, T. and Somasundaram, S. K. (2015) 'A case study of occupational hazards in silk industry.', International Journal of Application or Innovation in Engineering & Management, 4(5).

Sujatha, K. and Sathish, J. (2017) 'A study on health problems faced by workers in silk industry.', International Journal of Entomology Research, 2(1), pp. 76–78.

Sundt, E., Willhalm, B. and Stoll, M. (1964) 'Analyse des parties acides de l'essence de bergamote saponifiee.', Helv. Chim. Acta, 47, pp. 408–413.

Sunstein, C. R. (1996) 'Social Norms and Social Roles.', Columbia Law Review. Columbia Law Review Association, Inc., 96(4), pp. 903–968.

Supyuenyong, V., Islam, N. and Kulkarni, U. (2009) 'Influence of SME characteristics on knowledge management processes', Journal of Enterprise Information Management. Edited by Y. K. Dwivedi. Emerald Group Publishing Limited, 22(1/2), pp. 63–80.

Suresh Kumar, N. et al. (2001) 'Studies on the effect of high temperature on F1 hybrids between polyvoltine and bivoltine silkworm races of Bombyx mori L', International Journal of Industrial Entomology, 2(2), pp. 123–127.

Swamy, K. (2016) 'Majority poor Indian peasant farmers - victims of middlemen exploitation - are rendered perpetually poverty - stricken-cum-debt ridden: measures to alleviate perennial rural poverty through village democratization.', Journal of Financial Management and Analysis, 29(1), pp. 65–78.

Taattong Farm (no date) Sericin-Mulberry soaps (in Thai).

Tacoli, C. (2002) Changing rural-urban interactions in sub-Saharan Africa and their impact on livelihoods: a summary. London.

Tacoli, C. (2003) 'The links between urban and rural developments', Environment & Urbanization, 15(1).

Takasu, Y., Yamada, H. and Tsubouchi, K. (2002) 'Isolation of three main sericin components from the cocoon of the silkworm, Bombyx mori.', Bioscience, Biotechnology and Biochemistry, 66(12), pp. 2715–2718.

Takeda, S. (2009) Encyclopedia of Insects, Encyclopedia of Insects. Elsevier.

Tamada, Y. et al. (2004) 'Sulfation of silk sericin and anticoagulant activity of sulfated sericin.', Journal of Biomaterials Science, 15, pp. 971–980.

Tanaka, K. et al. (1999) 'Determination of the site of disulfide linkage between heavy and light chains of silk fibroin produced by Bombyx mori.', Biochimica et Biophysica Acta, pp. 92–103.

Tanaka, K. et al. (2009) 'Highly selective tuning of a silkworm olfactory receptor to a key mulberry leaf volatile.', Current biology: CB, 19(11), pp. 881–90.

Taussig, M. T. (2010) The devil and commodity fetishism in South America. University of North Carolina Press.

Taylor, A. (1980) 'Soaps and detergents and the environment', Journal of the American Oil Chemists' Society. Springer-Verlag, 57(11), pp. 859–861.

Temple, B., Edwards, R. and Alexander, C. (2006) 'Grasping at context: Cross language qualitative research as secondary qualitative data analysis.', Forum: Qualitative Social Research, 7(4).

Temple, B. and Young, A. (2004) 'Qualitative Research and Translation Dilemmas', Qualitative Research, 4(2), pp. 161–178.

Teschari, P. et al. (no date) Silk soap production methods (in Thai).

Thai Meteorological Department (TMD) (2010) The climate of Thailand.

National Economic and Social Development Board (NESDB) and the World Bank (2005) Thailand Northeast Economic Development Report. Bangkok.

TTINT (2010) Amazing silk powder (in Thai). Bangkok.

Thailand Law Forum (2011) Thailand Cosmetic Law.

Thailand National Statistic Office (NSO) (2013) Executive Summary: Advance Reports 2013, Agricultural Census.

ThaiTambon (2017) OTOP products.

Thanisorn, R., Byaporn, N. and Chanchai, B. (2012) 'Thai Consumers' Perception on Herbal Cosmetic Products: A Comparative Study of Thai and Imported Products.', Information Management and Business Review, 4(1), pp. 35–40.

BEDO (2013) Five-year action plan of BEDO (2013-2017). Bangkok.

BEDO (2017) 20-year strategy framework of BEDO (2017-2036). Bangkok.

BEDO (2019) Chumtabong Sericulture Community Enterprise (in Thai).

The Chaipattana Foundation (no date) Philosophy of Sufficiency Economy.

The Government Public Relations Department (PRD) (2016a) 12th National Economic and Social Development Plan.

The Government Public Relations Department (PRD) (2016b) The innovation of silk protein sericin benefits the beauty sector. (in Thai).

The International Trade Administration (ITA) (2018) Thailand - Personal Care and Beauty Products, Export.gov.

QSDS (2013) Thailand Sericulture Strategy 2013 (in Thai). Bangkok.

QSDS (2015) Thailand Sericulture Strategy 2015-2018.

QSDS (2009) Areas of mulberry cultivation, numbers of farmers and silk productivity.

The Revenue Department (2017) Tax manual for small and micro community enterprise (in Thai).

The Royal Forest Department (2017) Areas of forest coverage in Thailand during 1973-2017.

The Royal Thai Government (2015) Thailand Cosmetic Act C.E. 2015 (in Thai).

The World Bank (1997) Transport in Thailand: Lessons for Institutional Development.

The World Bank (2017) Thailand Overview.

Thomas, G. (2011) 'A Typology for the Case Study in Social Science Following a Review of Definition, Discourse, and Structure', Qualitative Inquiry, 17(6), pp. 511–521.

Thrift, N. and Olds, K. (1996) 'Refiguring the economic in economic geography', Progress in Human Geography, 20(3), pp. 311–337.

Todd, A. M. (2004) 'The aesthetic turn in green marketing: environmental consumer ethics of natural personal care products', Ethics and the Environment, 9(2), pp. 86–102.

Top, B. T. and Ucum, I. (2015) 'Sericulture in organic agriculture areas in Turkey and its contribution to sustainability sector', in 2nd International Conference on Sustainable Agriculture and Environment.

Topographic-map (2018) Topography of Thailand.

Tribhuwan, S. and Mathur, S. M. (1989) 'The main factor in mulberry that attracts the Bombyx mori L. silkworm.', Indian Silk,2, 28, pp. 39–40.

Tsang, S., Royse, C. F. and Terkawi, A. S. (2017) 'Guidelines for developing, translating, and validating a questionnaire in perioperative and pain medicine.', Saudi journal of anaesthesia,11(Suppl 1), pp. 80–89.

Turban, D. B., Eyring, A. R. and Campion, J. E. (1993) 'Job attributes: Preferences compared with reasons given for accepting and rejecting job offers', Journal of Occupational and Organizational Psychology, 66(1), pp. 71–81.

Turner, J. and Fouracre, P. (1995) 'Women and transport in developing countries.', Transport Reviews, 15(1), pp. 77–96.

Turner, J. M. (2015) 'Following the Pb: An Envirotechnical Approach to Lead-Acid Batteries in the United States', Environmental History, 20(1), pp. 29–56.

Turton, C. et al. (1997) 'The use of complementary methods to understand the dimensions of soil fertility in the hills of Nepal.', in PLA Notes. London, pp. 37–41.
Twinn, S. (1997) 'An exploratory study examining the influence of translation on the validity and reliability of qualitative data in nursing research.', Journal of advanced nursing, 26(2), pp. 418–23.
U.S. Central Intelligence Agency (no date) Thailand map.
Ugoh, S. (2017) Walking the sweet orange chain: Agri-food geographies of citrus losses (unpublished). University of Nottingham.
Uherek, E. et al. (2010) 'Transport impacts on atmosphere and climate: Land transport', Atmospheric Environment, 44(37), pp. 4772–4816.
Ullal, S. and Narasimhanna, M. (1981) Hand Book of Practical Sericulture, Central Silk Board. Bombay.
UNCTAD/WTO (1997) Silk Review 1997: A survey of international trends in production and trade. Geneva.
UNCTAD/WTO (2002) Silk Review 2001: A survey of international trends in production and trade. Geneva.
United Nations (UN) (2015) Resolution adopted by the General Assembly on 25 September 2015.
UNDP (2014) About Thailand.
United Nations Development Programme (UNDP) (2016) Thailand common country assessment.
University of Texas Libraries (no date) 'Thailand maps'.
Vaccaro, I. and Beltran, O. (2007) 'Consuming space, nature and culture: patrimonial discussions in the hyper-modern era.', Tourism Geographies, 9, pp. 259–274.
Vaithanomsat, P. and Kitpreechavanich, V. (2008) 'Sericin separation from silk degumming wastewater', Separation and Purification Technology, 59(2), pp. 129–133.
Valeepitakdej, V. and Wongsurawat, W. (2015) 'Can top-down community enterprise development reduce poverty and out-migration? Evidence from Thailand', Development in Practice, 25(5), pp. 737–746.
Valentinov, V. (2007) 'Why are cooperatives important in agriculture? An organizational economics perspective.', Journal of Institutional Economics, 3(1), pp. 55–69.
Vanwambeke, S. O., Somboon, P. and Lambin, E. F. (2007) 'Rural transformation and land use change in northern Thailand', Journal of Land Use Science, 2(1), pp. 1–29.

Vasantha, S., Varatharaj, V. and Shalini, P. (2013) 'A study on buyer behaviour and brand loyalty of toilet soaps in Kanchipuram district (Tamil Nadu).', International Journal of Current Research, 5(5), pp. 1194–1197.

Veiga, J. P. C. and Zacareli, M. A. (2014) Between the local and the international: sustainability of Brazilian rainforest products for the natural cosmetics market.

Verlagsgesellschaft, W. (1981) Mundus.

Vermeer, B. J. (2000) 'Definition', in Elsner, P. and Maibach, H. I. (eds) Cosmeceuticals: Drugs VS. Cosmetics. New York, NY: Marcel Dekker, Inc.

Vermeir, I. and Verbeke, W. (2006) 'Sustainable Food Consumption: Exploring the Consumer "Attitude – Behavioural Intention" Gap', Journal of Agricultural and Environmental Ethics, 19(2), pp. 169–194.

Vollrath, F. et al. (2013) 'Life Cycle Analysis of Cumulative Energy Demand on Sericulture in India', in 6th BACSA International Conference, pp. 1–13.

Walker, A. R. (1975) Farmers in the hills: upland peoples of North Thailand. Georgetown.

Walker, A. R. (1980) 'The Production and Use of Opium in the Northern Thai Uplands: An Introduction', Contemporary Southeast Asia, 2(2), pp. 135–154.

Wall, M., Liefeld, J. and Heslop, L. A. (1991) 'Impact of country-of-origin cues on consumer judgments in multi-cue situations: a covariance analysis', Journal of the Academy of Marketing Science, 19(2), pp. 105–113.

Wani, K. A. and Jaiswal, Y. K. (2011) 'Health hazards of rearing silk worms and environmental impact assessment of rearing households of Kashmir, India', Indian Journal of Public Health Research and Development, 10(1), pp. 85–90.

Warde, A. (1992) 'Notes on the Relationship Between Production and Consumption.', in Burrows, R. and Marsh, C. (eds) Consumption and Class: Divisions and Change. New York: St. Martin's Press, pp. 15–31.

Weir, K. A. (2008) 'Women's Public and Private Tensions: Handicraft NGOs and Women's Development in Thailand', Asian Journal of Women's Studies, 14(4), pp. 80–106.

Whatmore, S. and Thorne, L. (1997) 'Nourishing Networks: Alternative Geographies of Food', in Goodman, D. and Watts, M. J. (eds) Globalising food: Agrarian questions and global restructuring. London: Routledge, pp. 287–304.

Wiel-Shafran, A. et al. (2006) 'Potential changes in soil properties following irrigation with surfactant-rich greywater', Ecological Engineering, 26(4), pp. 348–354.

Wiley, A. S. (2011) 'Milk for "growth": global and local meanings of milk consumption in China, India and the United States.', Food and Foodways, 19, pp. 11–33.

Willis, P. (1990) Common culture: symbolic work at play in the everyday cultures of the young. Westview Press.

Wilson, C. and Tisdell, C. (2000) Why farmers continue to use pesticides despite environmental, health and sustainability costs. 53.

Winter, M. (2003) 'Geographies of food: agro-food geographies making reconnections', Progress in Human Geography, 27(4), pp. 505–513.

Wolcott, H. F. (1944) Transforming qualitative data: description, analysis and interpretation. California: Thousand Oaks: Sage.

Wong, J., Chan, H.-K. and Chrzanowski, W. (2014) 'Silk for pharmaceutical and cosmeceutical applications', in Kundu, S. (ed.) Silk Biomaterials for Tissue Engineering and Regenerative Medicine. Oxford: Woodhead Publishing Limited, pp. 519–545.

World Bank (2004) Thailand Environment monitor.

World Bank (2016) Thailand systematic country diagnostic.

World Fairtrade Organization (no date) Silk Story.

Wuttakul, W. and Panyura, Y. (1994) 'Weaving Textile and the Way of Thai Life', Thai Textile. Bangkok: The National Culture Committee Office.

Yeh, E. T. and Lama, K. T. (2013) 'Following the caterpillar fungus: nature, commodity chains, and the place of Tibet in China's uneven geographies', Social & Cultural Geography, 14(3), pp. 318–340.

Yhoung-Aree, J., Puwastien, P. and Attig, G. A. (1997) 'Edible insects in Thailand: an unconventional protein source?', Ecology of Food and Nutrition, 36, pp. 133–149.

Yin, R. K. (2003) Case study research: Design and method. 3rd edn. CA: SAGE Publications.

Yin, R. K. (2009) Case study: design and methods. London: SAGE Publications.

Yin, R. K. (2012) 'A (Very) brief researcher on the case study method.', in Applications of case study research. Thousand Oaks, California: Sage.

Yin, R. K. (2014) Case Study Research: Design and Methods. 5th edn. London: SAGE Publications.

Yokohira, M. et al. (2008) 'Antioxidant effects of flavonoids used as food additives on liver carcinogenesis in a rat medium-term bioassay.', Journal of food science, 73(7).

Yoshida, A. (1999) 'Toward the Solutions of the World's Most Vexing Problems in Developing Regions.', Plant Biotechnology. Japanese Society for Plant Cell and Molecular Biology, 16(1), pp. 81–88.

Yu, L. et al. (2018) 'The role of individual colour preferences in consumer purchase decisions', Color Research & Application, 43(2), pp. 258–267.

Zhang, Y.-Q. (2002) 'Applications of natural silk protein sericin in biomaterials', Biotechnology Advances, 20(2), pp. 91–100.

Zhang, Z.-Y. et al. (2008) 'Acute toxicity of organophosphorus and pyrethroid insecticides to Bombyx mori.', Journal of economic entomology, 101(2), pp. 360–4.

Zhaorigetu, S. et al. (2001) 'Supplemental silk protein, sericin, suppresses colon tumorigenesis in 1,2-dimethylhydrazine-treated mice by reducing oxidative stress and cell proliferation.', Bioscience, Biotechnology and Biochemistry, 65, pp. 2181–2186.

Zhaorigetu, S. et al. (2003a) 'Inhibitory effects of silk protein, sericin on UVB-induced acute damage and tumor promotion by reducing oxidative stress in the skin of hairless mouse.', Journal of Photochemistry and Photobiology, 71, pp. 11–17.

Zhaorigetu, S. et al. (2003b) 'Silk protein, sericin, suppresses DMBA-TPA-induced mouse skin tumorigenesis by reducing oxidative stress, inflammatory responses and endogenous tumor promoter TNF-alpha.', Oncology Reports, 10, pp. 537–543.

Zhisten, J., Mengcheng, T. and Jianming, W. (1999) 'The determination of flavonoid contents in mulberry and their scavenging effects on superoxide radicals.', Food Chemistry, 64, pp. 555–559.

Zhou, C. Z. et al. (2000) 'Fine organization of Bombyx mori fibroin heavy chain gene', Nucleic Acids Research, 28, pp. 2413–2419.

Appendix 1: Questionnaire Form

Date……..

Questionnaire

This questionnaire is used for doctoral research of Paphaphit Wanasuk, a Ph.D. student from University of Nottingham, UK. This is to investigate socio-environmental impacts of the commodity chain of soap produced by community enterprises in Thailand. All data collected is used solely for the research purpose and will not be used for commercial profits.

You can choose to

[ ] allow your name in publication [ ] omit your name in publication

A. Demographic information

1. Name……Surname……
2. Address
   - Village ……
   - Subdistrict……
   - District……
   - Province……
3. Member of community enterprise named……
4. Contact number……
   Email address……

B. Socio-economic information

1. Gender [ ] Male [ ] Female
2. Age……years
3. Marriage status [ ] Single [ ] Married
4. Nationality……
5. Education background

[ ] No education [ ] Primary School Year…… [ ] Junior High School
[ ] Senior High School/Vocational Certificate [ ] High Vocation Certificate
[ ] Bachelor degree [ ] Master degree [ ] Doctoral degree

5. Main occupation……Period……years
6. Main salary per month (choose only one option)

[ ] <1,000 Baht/month [ ] 1,001-2,500 Baht/month
[ ] 2,501-5,000 Baht/month [ ] 5,001-7,500 Baht/month
[ ] 7,501-10,000 Baht/month [ ] >10,000 Baht/month (please specify…….)

7. Secondary occupation……
Period……years

[ ] <1,000 Baht/month [ ] 1,001-2,500 Baht/month
[ ] 2,501-5,000 Baht/month [ ] 5,001-7,500 Baht/month
[ ] 7,501-10,000 Baht/month [ ] >10,000 Baht/month (please specify…….)

C. Roles in the commodity chain of soap

[ ] Mulberry farmer. Mulberry types…….
[ ] Silkworm rearers. Silkworm breeds……..
[ ] Silk cocoon or silk yarn supplier
[ ] Degumming silk glue for……..
[ ] Silk reeler
[ ] Soapmaker
[ ] Owner of soap business
[ ] Middleman/agent of soap
[ ] Salesman of soap
[ ] Consumers of soap
[ ] Silk weaver
[ ] Other. Please specify……..

Name……
(Respondent who gives information to research)

If you have further suggestions to this research, please contact Paphaphit Wanasuk at email lgxpw3@nottingham.ac.uk or 097-1877896.

Appendix 2: Interview Protocols

Appendix 2.1 Interview Questions for Mulberry Farmers

Topic themes	Interview questions
Farmers' backgrounds	• What's your job? • What makes you choose to do this job? • How long have you been doing this? • What have you been doing before becoming a mulberry farmer? • Do you consider this as a primary or secondary job?
Mulberry cultivation practices	• What varieties of mulberry do you grow? Why? • How do you cultivate mulberry trees? • What chemicals do you use on mulberry trees?
Waste from mulberry cultivation	How do you manage wastes generated during the mulberry cultivation practices?
Picking mulberry leaves for silkworms	What's your routine when picking mulberry leaves?
Distribution of mulberry leaves	How and where do you sell your mulberry leaves?
Impacts of mulberry cultivation activities on their livelihood	What are the impacts of mulberry cultivation on your livelihood?
Impacts of mulberry farms on community	What are the impacts of mulberry farms on your community? Who are impacted by these practices?
Impacts of mulberry farms on the environment	What are the environmental impacts of mulberry cultivation?
Relationship with other chain actors	How is your relationship with people in the silk business?

Appendix 2.2 Interview Questions for Silkworm Rearers

Topic themes	Interview questions
Backgrounds of silkworm rearers	• What's your job? Why do you do it? • What makes you choose to do this job? • How long have you been doing this? • Do you consider this as a primary or secondary job?
Silkworm rearing practices	• What variety of silkworms are you rearing? Why do you choose this type? • How do you rear silkworms?
Waste from silkworm rearing	How do you manage wastes generated during the silkworm rearing practices?
Distribution of silkworms & silk cocoons	How do you transport silkworms and silk cocoons? Who do you trade with?

Impacts of silkworm rearing activities on their livelihood	How does silkworm rearing impact your livelihood?
Impacts of silkworm rearing activities on community	How are community impacted by silkworm rearing practices? Who are particularly impacted by these practices?
Impacts of silkworm rearing activities on the environment	How are the environment impacted by silkworm rearing?
Relationship with other chain actors	How is your relationship with people in the silk business?

Appendix 2.3 Interview Questions for Silk Reelers

Topic themes	Interview questions
Backgrounds of silk reelers	• What's your job? Why do you do it? • What makes you choose to do this job? • How long have you been doing this? • Do you consider this as a primary or secondary job?
Distribution of silk/ silk cocoons	How do you transport silk? Who do you trade with?
Silk degumming and processes	• What chemicals do you use during degumming process? • What silk reeling methods do you use to obtain silk fibres?
Waste from silk reeling processes	How do you manage silk waste from reeling process?
Impacts of silk reeling activities on their livelihood	How does silk reeling impact your livelihood?
Impacts of silk reeling activities on their community	How are community impacted by silk reeling? Who are particularly impacted by these practices?
Impacts of silk reeling activities on their environment	How are the environment impacted by silk reeling?
Relationship with other chain actors	How is your relationship with people in the silk business?

Appendix 2.4 Interview Questions for Silk Suppliers

Topic themes	Interview questions
Backgrounds of middlemen	• What's your job? Why do you do it? • What makes you choose to do this job? • How long have you been doing this?

	• Do you consider this as a primary or secondary job?
Raw material sourcing	• How many types of silk do you supply? Why these types? • Where do you get these silks from? • Who do you supply these silks to? What are they used them for?

Appendix 2.5 Interview Questions for Soapmakers

Topic themes	Interview questions
Backgrounds of soapmakers	• What's your job? Why do you do it? • What makes you choose to do this job? • How long have you been doing this? • Do you consider this as a primary or secondary job? • What makes you choose to become soapmaker?
Soap production	How do you produce soap? Why do you produce it this way?
Wastes generated during soapmaking	How do you manage wastes generated during the soapmaking?
Distribution channels	How and where do you sell this soap?
Impacts of soap on their livelihood	How does soapmaking impact your livelihood?
Impacts of soap on their community	• How is your community impacted by soap production? - Who are particularly impacted by this?
Impacts of soap on environment	How does soapmaking impact the environment?
Relationship with other chain actors	How is your relationship with people in the soap business?
Marketing activities	• How do you promote your products to consumers? • Who are your major consumers? Where are they from?

Appendix 2.6 Interview Questions for Enterprise Members Who Do Not Produce Soap

Topic themes	Interview questions
Backgrounds of entrepreneurs	• What's your job? • What makes you choose to do this job? • How long have you been doing this?

	• What silk-related products do you produce now? • Why don't you choose to produce soap?

Appendix 2.7 Interview Questions for Distributors, Middlemen, Traders and Sellers of Soap

Topic themes	Interview questions
Backgrounds of distributors/middlemen	• What's your job? Why do you do it? • What makes you choose to do this job? • How long have you been doing this? • Do you consider this as a primary or secondary job? • What makes you choose to become trader? • How long have you been doing this? • What have you been doing before becoming a soap trader? • What make you choose to sell this soap? Do you also trade other kinds of cosmetics or other products from sericulture community enterprises? • Have you engaged in any silk or sericin soap production? What are they?
Methods of distribution	• How do you distribute this soap and to where? • What methods do you use to distribute this soap and by what vehicle? • Do you resell them to other retailers or sell them directly to consumers? Why?
Distributional channels	• What distribution channels do you use to sell this soap? • Who is the target market for each channel?
Consumer backgrounds	• What are their characteristics and behaviour of their purchase? • How does channel of distributions impact consumers' decisions in buying this soap?
Profit generation	• What is the retail price of sericin soap? How much profit can you make from trading them? What is the capital cost? • Do you sell soap at different prices to different groups of consumers/retailers? Why and why not? • Do you know where they resell these sericin soap and how much they sell them? • Have you changed the packaging and branding of soap to other brands? Why do you that? Who do you sell them to and at what prices?

Soap trading impacts	• How does the soap trading impact your life, local environment and community?

Appendix 2.8 Interview Questions for Soap Consumers

Topic themes	Interview questions
Backgrounds of consumers	• Where are you from? • What's your job? • Where do you buy sericin soap? • Have you purchased this product before? • How long have you been using soap?
Factors that impact consumers to use this product	• What makes you buy and use this soap? • Are you concerned with the origins of ingredients used in soap? Why and why not? • Are you aware of how this product is made? If so, will this affect your decision in buying them? Will your criteria change according to the type of cosmetics? • What do you use this soap for? • How do you judge the quality of soap? • Do you have the different criteria when buying other kinds of cosmetics compared to soap? Why and why not?
Social and environmental impacts of the commodity chain of soap	• Do you think the supply chain of soap have impacts on society and environment? Why and why not?

Appendix 2.9 Interview Questions for Non-Consumers of Sericin Soaps in the UK

Topic themes	Interview questions
Backgrounds of non-consumers	• Where are you from? • What's your nationality? • What's your job? • Have you heard of sericin soap? If so, from where? • Have you purchased or used this product before? If so, how long have you been using soap?
Factors that impact consumers to buy soap	• Are you concerned with the origins of ingredients used in soap? Why and why not? • Are you aware of how this product is made? If so, will this affect your decision in buying them? Will your criteria change according to the type of cosmetics? • What attribute of soap make you buy them?

	• If you plan to use sericin soap, what will you be using it for? • By looking at this soap, do you want to buy it? Why and why not? • What is the most preferable method for you to purchase them? Why? (In the case of non-consumers, where do you expect to buy sericin soap? • How do you judge the quality of soap? • Do you have the different criteria when buying other kinds of cosmetics compared to soap? Why and why not? • What is your expectation of sericin soap produced by community enterprises in Thailand?
Social and environmental impacts of the commodity chain of soap	• Do you think the supply chain of soap have impacts on society and environment? Why and why not?

Appendix 2.10 Interview Questions for Leaders of Sericulture Community Enterprises

Topic themes	Interview questions
Backgrounds of leader	• Where are you from? • What's your job? • What makes you choose to do this job? • How long have you been doing this? • What have you been doing before becoming a leader of community business? • How do you get selected to become a leader of this business? • What is your role as the leader of the community business? • How do you manage your members and businesses?
General backgrounds of community business	• How was the group formed? • What is the goal of your community business? • How many members do you have now and in the past? Where are they from? What are your members' socio-economic backgrounds? • What is the typical occupation of your members before and after joining the group? • How many members produce soap? Who are they? Where are they from?

	For the rest of the members, what do they do? • Do your members produce the same types of soap with the same standards and practices? Why and why not?
Criteria of choosing members of this community business	• What are the criteria in choosing members?
Benefit sharing	• How do you share benefits within the group?
Impacts of soap on local livelihood	• How does soapmaking impact local livelihoods?
Impacts of soap on their community	• How is your community impacted by soap production? - Who are particularly impacted by this?
Impact of soap on environment	• What is your perception of the impacts of producing soap on environment? Why? How's about other perceptions on this impact? • How do you manage environmental problems that occur due to soap production normally? - Do you have any problems in solving them?
Relationships with other chain actors	• How do people work together in the soap business?
Marketing activities	• How does community business help to promote soap products? • What aspects do you promote your products to your consumers? • Who are your major consumers?

Appendix 2.11 Interview Questions for Local Community Leaders

Topic themes	Interview questions
Backgrounds of community leader	• What's your job? • What makes you choose to do this job? • How long have you been a leader? • How do you get selected to become a local community leader?
Impacts of the commodity chain of soap on local livelihoods	• Have you perceived any socio-environmental impacts of sericulture activities and soap production on local livelihoods? What are they? - How do environmental impacts of sericulture practices and soap production affect locals' livelihoods? - How do locals respond to these problems?

	• Do you think there is any change in locals' livelihood when engaging in sericulture practices and soap production? What are they?
Impacts of the commodity chain of soap on community	• How do people in the community get along with each other? • Can you describe the social settings and relationship of people within your community before and after the sericulture industry and soap business exists or booms? • Do you notice any change in your community after sericulture activities/ soap production started? What are they? • How are community impacted by the commodity chain of soap? - Who are particularly impacted? - What have the community done to resolve these problems?
Impacts of the commodity chain of soap on environment	• What is your perception of the impacts of the commodity chain of soap on environment? Why? How's about other perceptions on this impact? - How does your community manage environmental problems? - Are there any problems/limitations in solving them?

Appendix 2.12 Interview Questions for Locals Who Live in the Community that Produce Soap and Carry Out Sericulture Activities

Topic themes	Interview questions
Backgrounds of locals	• How long have you been living in this community? • Are you originally from this area? • What's your job?
Impacts of the commodity chain of soap on local livelihoods	• Have you experienced any change in your livelihood due to the impacts of sericulture industry and soap production? What are they? • How do you or your community solve these problems?
Impacts of the commodity chain of soap on community	• How do people in the community get along with each other? • Does the relationship of people in the community change due to the impacts of sericulture industry and soap production? • How is your community impacted by the impacts of sericulture industry and soap production? - Who are particularly impacted by mulberry cultivation practices?

Impacts of the commodity chain of soap on environment	• What is your perception of the impacts of sericulture activities and soap production on environment? Why? How's about other perceptions on this impact? • Do you think sericulture activities and soap production have impacts on soils, water, insects, animals, air and other plants in the community? If so, what are they?

Appendix 2.13 Interview Questions for Municipal Officers Who are in Charge of Developing Communities

Topic themes	Interview questions
Impacts of the commodity chain of soap on local livelihood	• Have you perceived any impacts of the commodity chain of soap on your locals' livelihoods? What are they?
Impacts of the commodity chain of soap on community	• Have you perceived any impacts of the commodity chain of soap on your local community? What are they? - Who are particularly impacted?
Impacts of the commodity chain of soap on environment	• What is your perception of the impacts of sericulture activities and soap production on environment? Why? How's about other perceptions on this impact?

Appendix 2.14 Interview Questions for Government Agencies (QSDS, BEDO, TINT and CT)

Topic themes	Interview questions
Roles of government officials	• What is your role in the organisation? • How do you support community enterprise?
Selection criteria in choosing communities	• What makes your agency support this enterprise? • What is the criteria is choosing community enterprise to support?
Supports to communities	• How do you support community enterprises? • How do they benefit from your assistance? • Who benefit and don't benefit from this aid? Why?
Effectiveness of the program	• How do you measure the effectiveness of your programme? • How often do you assess the community which you support?

	• How do you expand your model to other community enterprises?
	• Is there any similarity or difference in terms of implementing your programme in other sericulture communities? What are they?
	  ○ How do locals focus change?
	  ○ Can any communities get the same opportunity to be assisted by your programme? Why and why not?
	• How do you differentiate your programme from other government programmes?
	  ○ What are the unique points of your programme compared to others?

Challenges and obstacles	• What kinds of obstacles do you face when you are trying to implement this programme/activity at the local level? • How do you overcome them? • What is your lesson learned from doing this programme?
Perceptions of impacts of the soap commodity chain	• What are the impacts of soapmaking projects on communities, locals and stakeholders?

Appendix 2.15 Interview Questions for Group Interviews with Enterprise Workers

Topic themes	Interview questions
Operational management of the enterprise	• How do you select the enterprise leader and people who take certain roles in the group? • How do you share profits within the enterprise? Who decide? • How is the profit generated in the enterprise used? Who manages it?
Participation of members	• What makes you decide to be part of this enterprise? • Why do you choose to produce and not produce soap?
Benefits/drawbacks of joining the enterprise	• What benefits do you get from joining the enterprise? • How was your life before joining the enterprise? • Are there any drawbacks being part of the enterprise? How?
Impacts of the soap commodity chain	• What do you think about the impacts of soapmaking?

Government supports	• What areas have government agencies supported your group in the soap business? What do you think about it? • How do agencies know which areas you want them to support your group and individuals?

Appendix 3: An Example of Translated Interview

Date: 14/11/15
Naree is the leader and community enterprise trader of Huaysai sericulture community enterprise.

Community enterprise trader's background (Theme)

- Is sericulturist your **main job**?
    - This is **my main occupation and it's also my main source of incomes for my household**. I **carry out sericulture and also weave silk**. At the same time, I also do **farming. (Occupation: Code)**
    - I earn about **40,000-50,000 Baht/month** by doing sericulture. **(Income: Code)**
- **How long** have you carried out sericulture and silk weaving?
    - 20 years. I started when I was 30 years old. Currently, I am around 49-50 years old. **(Working period for second job: Code)**

Sericulture community enterprise operation (Theme)

- What are the **main products sold** by this enterprise?
    - **Sericin soap and lotions. Silk handicraft scrubs. Silk Scarf and cloths**. We sell them nationally. Currently there is also a Japanese business group wants us to produce silk handicraft socks too. **(Products sold by SMCEs: Code)**
- Do you share a group profit to the member based on no. of shares they have?
    - No. We tend to help our members sell their products instead. For instance, when I have to go to trade fair, **I will ask members to bring their silk cloths together and I will sell on behalf of them. (Operational management at HS: Code)**
- How many members do you have now?
    - 126 people. Most are silk weavers and sericulturists. But not all of them are sericulturists. **They become members because they want to benefit from the funeral purpose. Basically, if they die, they will receive some financial support from our group. (SMCE contribution: Code)**

Appendix 4: Socioeconomic Analysis of Enterprise Workers

Table 11.1 The age of farmers in years

Community	Huaysai	Poethong Charoen	Chumtabong	Nayaw-NaUdom
Mean	58	61	49	53
Min	37	49	21	36
Max	83	82	65	72
SD	±13	±10	±14	±9

Table 11.2 Yearly income of farmers from agriculture (baht)

Community	Huaysai	Poethong Charoen	Chumtabong	Nayaw-NaUdom
Mean	264,050	129,000	154,150	246,550
Min	30,000	36,000	25,000	15,000
Max	1,000,000	360,000	350,000	2,500,000
SD	±282,043	±154,900	±137,160	±574,750

Table 11.3 Yearly income from secondary jobs of farmers (baht)

Community	Huaysai	Poethong Charoen	Chumtabong	Nayaw-NaUdom
Mean	57,850	20,950	73,335	94,450
Min	4,500	4,500	10,000	75,000
Max	360,000	72,000	600,000	250,000
SD	±83,020	±38,407	±183,195	±77,050

Table 11.4 Yearly income of farmers (baht)

Community	Huaysai	Poethong Charoen	Chumtabong	Nayaw-NaUdom
Mean	321,900	149,950	227,485	341,000
Min	30,000	36,000	10,000	25,000
Max	1,004,500	430,000	840,000	2,710,000
SD_{total}	±276,613	±174,945	±246,867	±614,701

Table 11.5 Farming experience (average years per person)

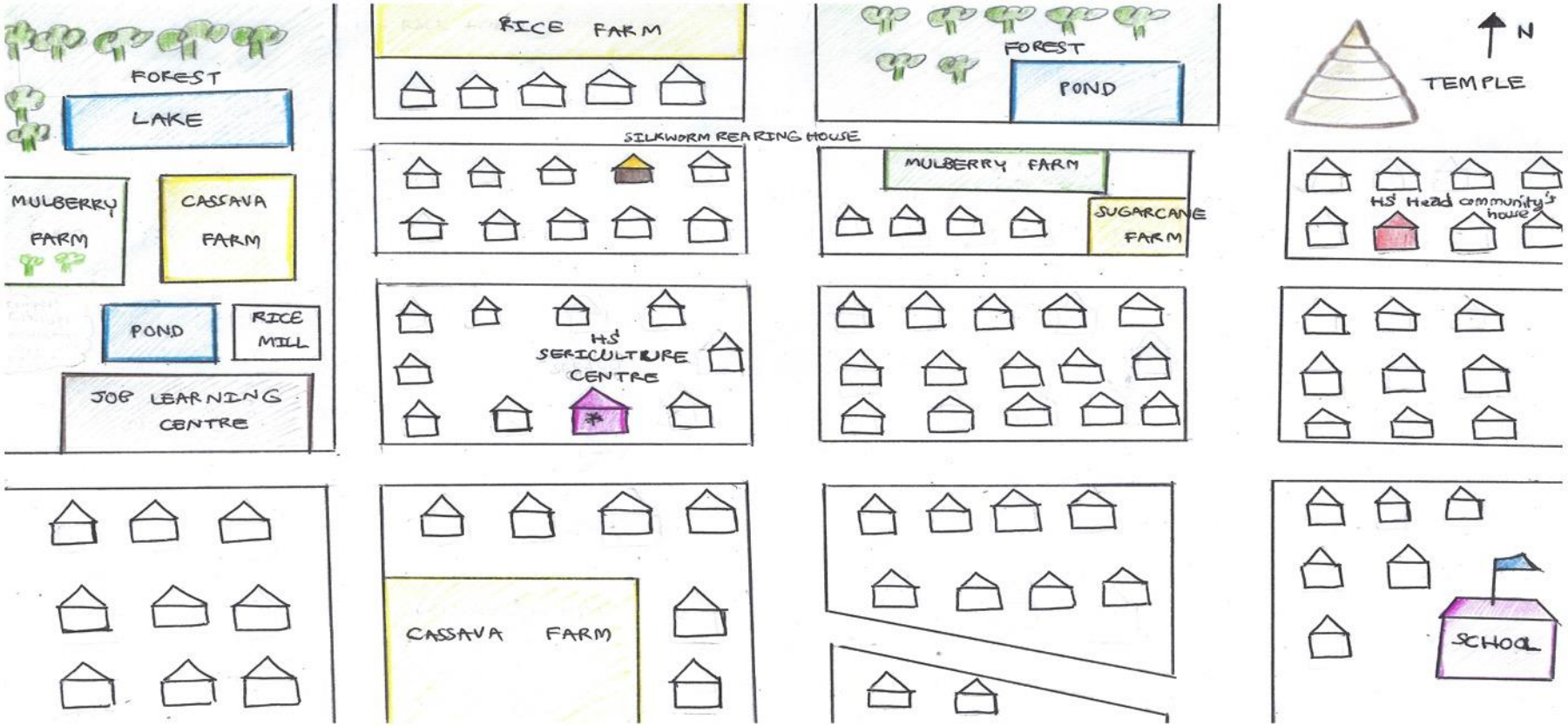
Community	Huaysai	Poethong Charoen	Chumtabong	Nayaw-NaUdom
Mean	40	21	34	38
Min	18	3	6	3
Max	70	40	60	60
SD	±13	±18	±19	±13

Table 11.6 Experience of secondary jobs (average years per person)

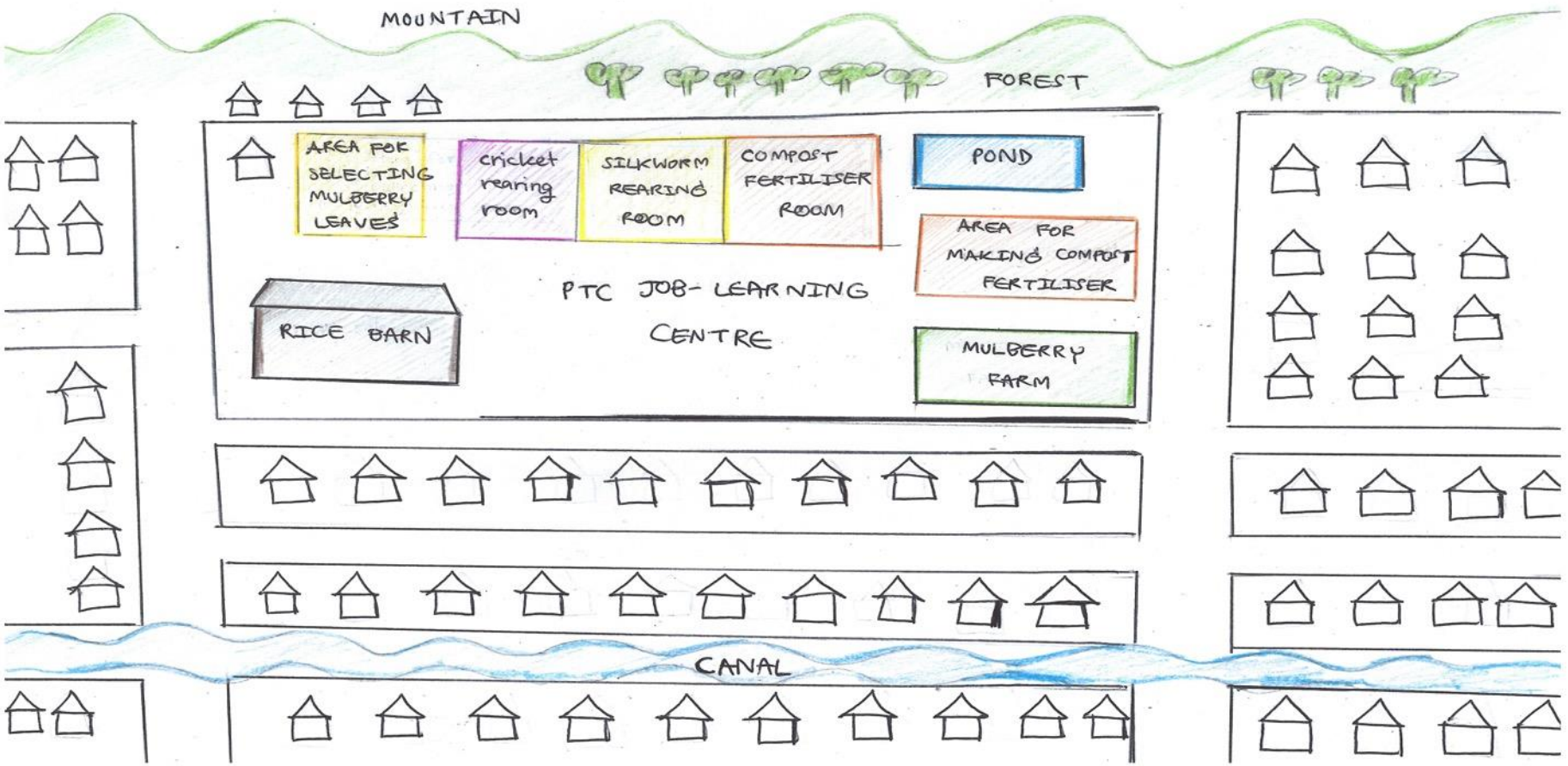
Community	Huaysai	Poethong Charoen	Chumtabong	Nayaw-NaUdom
Mean	27	5	14	14
Min	5	4	3	1
Max	60	6	45	30
SD	±16	±1	±14	±10

Appendix 5 Schematic Maps of Sericulture Communities

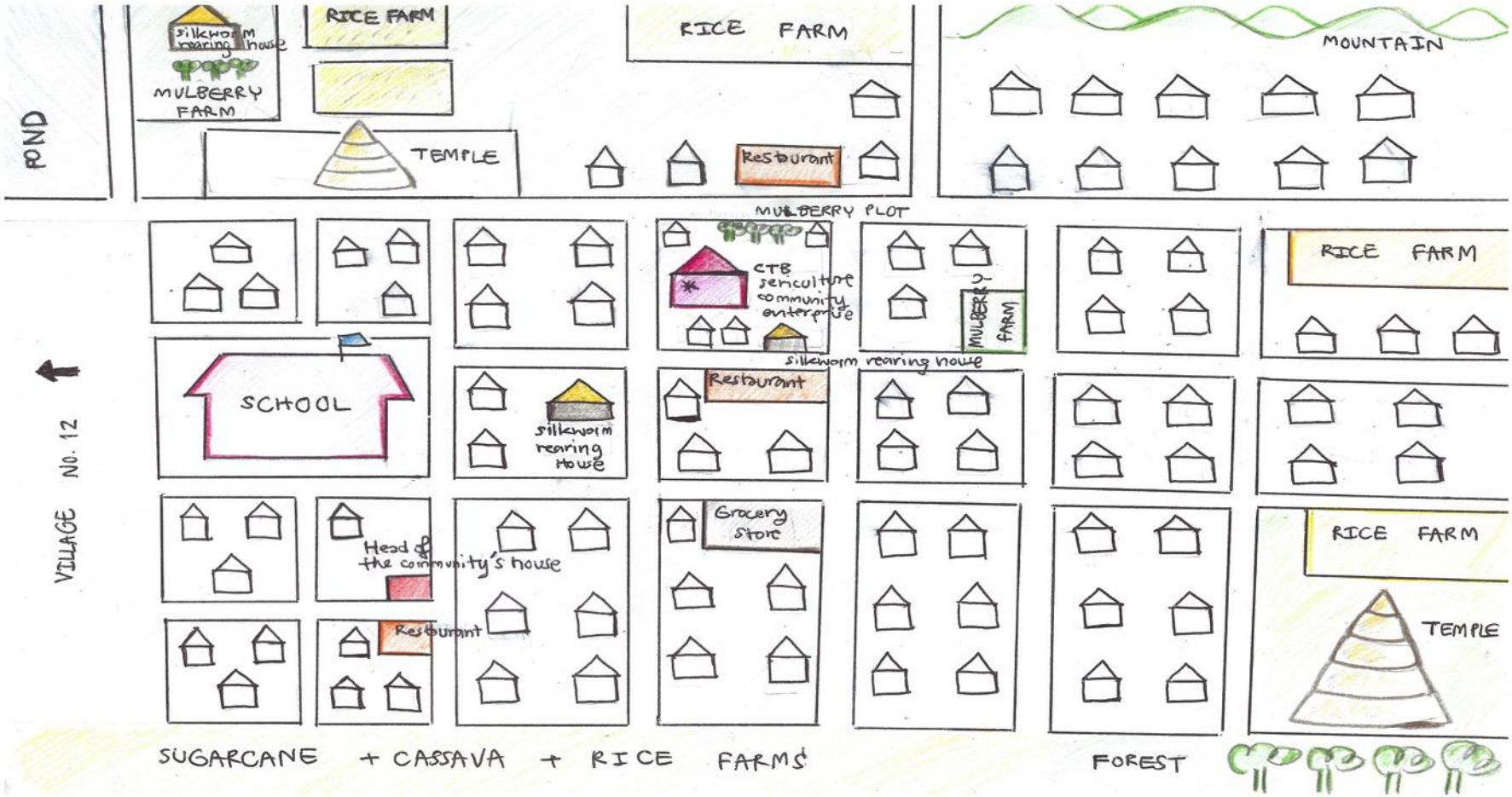
Appendix 5.1 Schematic Map of Huaysai Community (not to scale)



Appendix 5.2 Schematic Map of Poethong Charoen Community (not to scale)



Appendix 5.3 Schematic Map of Chumtabong Community (not to scale)



Appendix 5.4 Schematic Map of Nayaw and NaUdom Communities (not to scale)

