An Exploratory Value Chain Analysis for Burmese Pickled Tea (LAPHET)

A thesis presented in partial fulfilment of the requirements for the degree of

Masters of AgriCommerce

in

Agribusiness

Institute of Agriculture and Environment

MASSEY UNIVERSITY

Palmerston North, NEW ZEALAND

SO PYAY THAR

2016

ABSTRACT

Laphet (pickled tea) is a well-known traditional cuisine of Myanmar consisting of tea leaves fermented into a pickle. It has a unique taste different from tea used for drinking and has health benefits. Despite the fact that pickled tea is a popular food in Myanmar, no research has been done to analyse its value chain and evaluate its potential in the global market.

This study is an exploratory research and aims to examine the value chain of pickled tea from production to the final consumer and to evaluate how to improve the quality in the value chain. In addition, the improvements to the integrity to the pickled tea value chain are addressed.

The value chain analysis revealed the major actors in the pickled tea value chain and described the process as tea leaves pass through several intermediaries with value being added at each stage before reaching the end consumer. The chain is governed by wholesalers and manufacturers who have capital advantage over the other chain actors. Therefore, farmers get the lower share of the price margin.

This study shows the domestic pickled tea value chain and it describes the upgrades to the chain if it is to be upgraded. Pickled tea is a profitable industry and has high potential in the global market. However, there are considerable weaknesses and challenges to developing a sustainable pickled tea industry from both farm and market perspective. Supply issues such as availability of tea leaves, quality and consistency of the pickled tea, and effective grading along the value chain were addressed. Food safety and traceability is also a key area of concern.

The study recommends that value chain upgrading can help improve the effectiveness and efficiency of the chain. Generally, the findings suggest that strategies aiming to strengthen the linkages within the value chain, collective marketing, and improved processing technologies can enhance the development of the pickled tea value chain in Myanmar. Therefore, policy aiming at increasing farmers' access to modern technology and inputs, developing infrastructure, cooperative development, and improving extension systems are recommended to accelerate the chain's development.

ACKNOWLEDGEMENTS

It is a pleasure to thank those who have helped to make this thesis possible.

First of all, I am deeply grateful to my supervisors Walter Glass, for his encouragement, guidance, supervision, advice and support in undertaking this research and to Nicola Shadbolt who has given me guidance and invaluable and constructive feedback. Next, I owe my deepest gratitude to my program director, Iona McCarthy, for her encouragement and support throughout the study year. I also wish to express my thanks to Brian Wilkinson for his help in testing the pH level of the pickled tea prior to the taste test, even though taste testing was not able to be conducted in this study. I am also thankful to Denise Stewart and Fiona Bardell for their valuable help and support.

My sincere gratitude also goes to the staff at the International Student Office for being supportive, understanding, and welcoming throughout the whole study program. Special thanks to Jamie Hooper and Dave Broderick.

I am also very grateful to the New Zealand Development Scholarship that supported financially to pursue my Masters at Massey University and gave me this marvellous opportunity to study and experience this wonderful country, New Zealand.

Thanks to all the value chain participants and restaurants who assisted enthusiastically in the interviews. I greatly appreciate the valuable time they gave, sharing their opinions and ideas to be part of the study.

Special thanks also go to Uncle Tin Win and Uncle Win Kyaw who accompanied me

to the survey sites and linked me with pickled tea farmers, traders, and wholesalers, in addition to giving information about pickled tea. I also wish to convey special thanks to Uncle Htun Myaing for his invaluable knowledge and information on the recent updates on pickled tea exports to the United States.

I must extend my deepest gratitude to my beloved parents for their enormous support in every step of my life and help making me who I am today. I hope I made them proud. I also appreciate my sister for giving time to go through my thesis and for her suggestions and advice and my brother for his encouragement and support. I also wish to express my love and gratitude to my partner for his endless love and support, throughout the duration of my study.

Lastly, I offer my heartfelt gratitude to all of those who supported me in any respect during my studies.

TABLE OF CONTENTS

ABSTRACT i

ACKNOWLEDGEMENTS iii

List of Tables viii

List of Figures ix

GLOSSARY xi

CHAPTER 1 1

INTRODUCTION 1

1.1 Background of the Study 1
1.2 Objectives of the Study 4
1.3 Scope and Limitations of the Study 4
1.4 Significance of the Study 5
1.5 Outline of the Study 6

CHAPTER 2 8

LITERATURE REVIEW 8

2.1 Introduction 8
2.2 Context 8
2.2.1 Tea 8
2.2.2 World Tea Production 9
2.2.3 Tea in Myanmar 14
2.2.4 Varieties of Tea 23
2.2.5 Changing Consumer Demands 26
2.3 Value Chain Concept 27
2.3.1 Value Addition and Value Chain Upgrading 30
2.3.2 Value Chain Study Approaches 33
2.3.3 Value Chain Approach for Agricultural Products 35
2.3.4 Application of Value Chain Analysis on Tea 39

CHAPTER 3 42

METHODOLOGY 42

3.1 Introduction 42
3.2 Research Design 42
3.3 Description of the Study Areas 43
3.4 Research Methods 45
3.5 Data Collection 46

3.6 Data Analysis **50**

CHAPTER 4 ..... **52**

RESULTS **52**
4.1 Introduction **52**
4.2 Pickled Tea Value Chain **52**
4.2.1 Tea Picking 53
4.2.2 Producers and Processors 56
4.2.3 Traders 68
4.2.4 Wholesalers 68
4.2.6 Retailers 72
4.2.7 Consumers 73
4.2.8 Other Participants and Organisations 73
4.3 Margins and Benefit Shares of Participants **77**
4.4 Potential of Pickled tea in the International Market **77**
4.4 Pickled Tea in the United States Market **86**
4.5 Constraint to Research—Rationale for not Taste-Testing Myanmar Pickled Tea in New Zealand **87**

CHAPTER 5 ..... **90**

DISCUSSION AND RECOMMENDATION **90**
5.1 Introduction **90**
5.2 Weaknesses in the Value Chain **91**
5.2.1 Weak link 1: Inputs 92
5.2.2 Weak link 2: Tea plantations 93
5.2.3 Weak link 3: Processing, Trading, and Wholesaling 95
5.2.4 Weak link 4: Manufacturing and Retailing 97
5.2.5 Weak link 5: Consumers 98
5.3 Upgrading the Value Chain **98**
5.4 Recommendations **100**
5.4.1 Government strategies 100
5.4.2 Branding 101
5.4.3 Packaging and Food Safety 103
5.4.4 Product Differentiation 104

Chapter 6 ..... **106**

SUMMARY AND CONCLUSION **106**
6.1 Summary and Conclusion **106**
6.2 Suggestions for Future Research **108**

REFERENCES **111**

APPENDICES..... 131

APPENDIX-1: Laphet Value Chain Questionnaire - Farmers 131

APPENDIX-2: Laphet Value Chain Questionnaire - Wholesalers, Retailers, Manufacturer (Company)..... 136

APPENDIX-3: Laphet Value Chain Questionnaire - Govt. / Organization 145

APPENDIX-4: Laphet Value Chain Questionnaire - Restaurants..... 148

List of Tables

Table 1: **World Tea Production (thousand tonnes) 10**

Table 2: **World Tea Exports (thousand tonnes) 11**

Table 3: **World Tea Consumption (thousand tonnes) 12**

Table 4: **Tea Production in Myanmar 17**

Table 5: **Tea Production of the Different Types of Tea in Myanmar in tonnes. 19**

Table 6: **Prices of Different Types of Tea in Myanmar 20**

Table 7: **Export and Import of Tea in Myanmar 22**

Table 8: **Tea Picking Seasons in Myanmar 54**

Table 9: **Prices Received by Each Participant in the Value Chain and the Price Margins for Pickled Tea made by Low Quality Leaves and Good High Quality Leaves. 79**

Table 10: **Number of Restaurants Surveyed by Country 82**

Table 11: **Total Number of Pickled Tea Leaf Salad Dishes sold per Restaurant and the Prices sold at Different Countries 84**

List of Figures

Figure 1: **FAO tea composite price (Food and Agriculture Organization Statistics (FAOSTAT), 2015). 13**

Figure 2**: Statue of King Alaungsithu giving tea seeds to the people (located in Mt. Lwal Sal, Northern Shan State) 15**

Figure 3**: First tea plant in Myanmar located in Mount Lwal Sal, Northern Shan State. 16**

Figure 4: Tea producing areas in Myanmar (Note: Myanmar Department of Agriculture and Irrigation, 2013). 18

Figure 5: **High fluctuation in the prices of different types of tea in Myanmar. 20**

Figure 6: **Pickled tea leaf samples in a lacquerware tray (Ord, 2013). 24**

Figure 7: **Pickled tea leaf salad (Honn, 2014) 24**

Figure 8: **Supply chain and value chain (Fredendall & Hill, 2000). 29**

Figure 9: **Typical agricultural value chain and associated business development services (Anandjaysekeram & Gebremedhin, 2009) 36**

Figure 10: **Stages of value-addition to fresh tea leaves (Ariyawardana, 2001). 39**

Figure 11: **Map of Myanmar showing Shan State and the study areas of Namsan and Pindaya townships. 44**

Figure 12: **Data collection framework. 49**

Figure 13: **A typical pickled tea value chain. 53**

Figure 14: **Tea picking in the Northern Shan State 55**

Figure 15: **Scattered tea plants along the mountain slopes which require filling up and tall tea plants which require pruning for efficient picking of tea leaves. 55**

Figure 16: **Value chain of pickled tea exported to the U.S. market. 57**

Figure 17: **Step-by-step processing of green tea leaves into pickled tea. 59**

Figure 18: **Comparison of pickled tea processing 60**

***Figure 19*: Step-by-step processing of green tea leaves into pickled tea 62**

***Figure 20:* Storage of pickled tea: in plastic bags; in pits; and in steel tanks..... 65**

***Figure 21:* Production and market flow map of pickled tea. 67**

***Figure 22:* Pickled tea value chain 69**

***Figure 23:* Pickled tea prices (prices as of July, 2015). 70**

***Figure 24:* Prices of pickled tea sold at different stages in the value chain 78**

***Figure 25:* Difference in the prices of poor and high quality pickled tea received at each level of the value chain by the participants. 80**

***Figure 26:* Increase in prices of pickled tea sold at each level of the value chain..... 81**

***Figure 27:* A typical dish of pickled tea served as a salad. 82**

***Figure 28:* Pickled tea leaf salad before being mixed (Burma Superstar Tea Leaf Salad) 83**

***Figure 29:* Importance of certification on a Likert scale of 1-7. ..... 85**

***Figure 30:* Weak links in the pickled tea value chain. 91**

GLOSSARY

Laphet	Pickled tea
FAO	Food and Agriculture Organization
FAO IGG	Food and Agriculture Organization Intergovernmental Group
FAOSTAT	Food and Agriculture Organization Corporate Statistical Database
CTC	Crush, Tear and Curl tea
USAID	US Agency for International Development
USD	United States Dollar
VCA	Value Chain Analysis
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HACCP	Hazard Analysis Critical Control Point
FCL	Full Container Load
FSA	Food Safety Activities
GHP	Good Hygienic Practice
UNODC	United Nations Office on Drugs and Crime
IRC	International Rescue Committee
JICA	Japanese International Cooperation Agency
SADC	Swiss Agency for Development and Cooperation
DOA	Department of Agriculture
PTPA	Palaung Tea Producing Association
MFVPA	Myanmar Fruits and Vegetable Producers Association
MOAG	Myanmar Organic Agriculture Group

* All values in this document are expressed in USD ($) for the purpose of consistency and clarity.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Tea is the second-most-widely consumed beverage throughout the world, and it is consumed by a wide range of people in different age groups in all levels of society (Hicks, 2009). As tea is cultivated worldwide, there are several varieties of tea that compete in the global tea market; however, pickled tea—also known as *laphet* in Myanmar—is the form of tea that is eaten. Laphet consists of tea leaves which have been fermented into a pickle. It is a well-known traditional cuisine of Myanmar, which is one of the very few countries in the world where tea leaves are eaten.

Pickled tea (*laphet*) has been eaten in Myanmar for hundreds of years and the tradition has been handed down from generation to generation, so it has become a traditional food and plays a prominent role in the culture and daily lives of the Myanmar people. It has a unique taste, different from tea used for drinking, and remains popular in Myanmar due to its status as a national food, and for its purported health benefits. During ancient times, it was served only in royal ceremonies. Nowadays, it is normally eaten at the end of each meal as a supplement for satiety, as well as at special occasions, such as festivals, funerals, and weddings.

In Myanmar, there has been very limited research regarding pickled tea. Little, if anything, has been done to explore the potential of international appeal for pickled

tea or the value chain that might be applied. In regards to this, this study provides a planning insight into the potential for pickled tea (Laphet). Therefore, the specific objective of this research is to study the value chain of pickled tea in Myanmar and explore the opportunities for various channels that would be available for the Myanmar pickled tea industry, domestically as well as for the overseas market.

The Myanmar tea industry is facing a range of issues, including low investment in agricultural research; a lack of skilled technicians and labour; weak links between the extension services and farmers; insufficient capital for smallholder tea farmers; and a lack of technology for the cultivation, processing and packaging of pickled tea (Naing, 2011; Cho, 2013). These issues have hindered the development of Myanmar's pickled tea value chain and have hence restricted exports. There is a need for the development of new, innovative end products by utilizing increased commercialisation and technological application at a local level which will lead to value-added products. Efficient value chain analysis is a prerequisite in the development process of any economy (Hellin, 2006). Farmers' incomes can be increased not only by improving productivity but also through efficient and effective value addition. Vanhaverbeke and Cloodt (2006) stated that the difference between prices paid by consumers for value-added products and farmers' realisation has been increasing rapidly. Value addition has the potential to generate more local jobs, better income, and better services (Ravald & Gronroos, 1996). Therefore, value addition of pickled tea could play an important role in improving income and generating employment in certain rural areas of Myanmar

Despite the fact that pickled tea is very popular in Myanmar, it is not well-known outside of the country. However, due to ongoing policy reforms, Myanmar is gaining worldwide interest for business investments and tourism. With the worldwide increase in tourism, immigration, and international trade, the role of provenance has become more important not only in business and consumer behaviour (Rossiter & Chan, 2004), but also in food culture and the food industry (Lee et al., 2014). According to the Myanmar Department of Hotels and Tourism (2014), Myanmar has now become a very popular destination for tourists, and many people around the world are becoming familiar with Burmese cuisine. This has led to the build-up of demand for pickled tea as it is one of the most popular dishes in Myanmar. This research is important as it may help find a place for pickled tea in the global market and make Myanmar and its traditional cuisine becomes more well-known throughout the world.

Moreover, pickled tea is also beginning to gain popularity in countries with significant Burmese populations, such as the United States, Singapore, Thailand, Western Europe, and Australia, where 75% of Burmese migrants live (UN Census Data, 2013). According to Statistics New Zealand (2014), the Burmese ethnic group in New Zealand has also increased by 26.7% between 2006 and 2013, with 83.5% of Burmese migrants living in the North Island. However, pickled tea is still not well-known in New Zealand. In regards to the changing consumption habits and eating behaviour, the introduction of pickled tea into New Zealand would likely to impact on the eating patterns.

This study will assess the potential of pickled tea in countries such the United States, Singapore, Australia, Thailand with high Burmese population and also in

New Zealand. In addition, this research will also look at the critical aspects of the Burmese pickled tea and examine the performance of the industry chain along with the weaknesses hindering the industry and the improvements to the integrity to the value chain.

1.2 Objectives of the Study

The general objective of the study is to analyse the value chain of pickled tea in the study area. The specific objectives of this paper are:

(i) to describes the value chain of the Burmese pickled tea (*laphet*) and examine the performance of the participants in the value chain;

(ii) to identify the weaknesses that hinder the development of the pickled tea industry;

(iii) to address the improvements to the integrity to the pickled tea value chain

1.3 Scope and Limitations of the Study

This thesis describes an exploratory approach to the value chain of pickled tea specifically in the Shan State, which is the main tea-producing state in Myanmar. Pickled tea has received very limited attention in the tea sector as the processing of pickled tea is not widely known, as it has been embedded in Burmese traditional culture and village life. This research on the value chain involved the collection of primary and secondary data. Primary data was collected through a survey of

different tea farmers, pickled tea processors, urban and rural wholesalers, as well as other secondary and tertiary participants along the value chain. Interviews were also conducted with Burmese restaurants, either by personal visits or through phone or email, to study the potential of marketing pickled tea in New Zealand, Australia, Singapore, Thailand, and the United States.

As this study is the first to look at the value chain of pickled tea, it is limited by the lack of other detailed investigations which could reinforce understanding of the whole system, especially in regards to the demand side and consumption preference studies. Hence, due to time and financial constraints, the study was narrowed down to concentrate on the pickled tea value chain in the Shan State. Other tea products are not included. Moreover, this research is predominantly exploratory in nature and the survey results are used to draw only broad generalisations about the potential of pickled tea in the international market. However, further detailed studies are required to thoroughly test the feasibility of pickled tea internationally and to obtain a fully representative result.

1.4 Significance of the Study

The study analysed the value chain of pickled tea from input supplier to consumer. It also provides analysis of the existing challenges, opportunities, and weaknesses in the pickled tea value chain. Therefore, it could suggest ways to enhance the production and utilisation of pickled tea at a larger scale to bring about economic development in the study area. Moreover, the study also examines the potential of

the product in five different countries, and the preferences and requirements for the product to be sustainable in these niche markets.

The information generated could aid a number of research and development organisations, government and non-government organisations, traders, producers, and policy makers to assess their activities and ultimately influence the design and implementation of policies and strategies. This research contributes towards profiling the performance of pickled tea farmers and identifies ways that can be explored to incorporate farmers into formal markets and enable them to contribute to the economy. It could also help different participants in the value chain to identify and analyse new ways of stimulating innovation.

1.5 Outline of the Study

The thesis is organised as follows: the purpose of the study, along with the background, objectives, and limitations to the study, is set out in this first chapter.

In the second chapter, the literature of the study is reviewed.

The third chapter provides the research techniques and the methods used to analyse the value chain of pickled tea in Myanmar, followed by the methods used to investigate the potential for the introduction of pickled tea to New Zealand and four other countries: The United States, Australia, Singapore and Thailand. In this chapter, an overview of the study areas is given, along with the sources of primary and secondary data, data collection, data analysis, and constraints to the study.

The fourth chapter provides the main findings of the study, followed by the fifth chapter which is the discussion of the results and recommendations.

The final chapter presents a summary of the research findings, conclusions, and suggestions for future research, followed by a list of references at the end of the thesis.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the literature on tea production, export, and consumption around the world and in Myanmar. It also addresses the health benefits of pickled tea, and different ways of eating it. A comparison of the market prices for normal tea and pickled tea is also given in this chapter. As pickled tea is a new area of study, there is little specific existing literature on this type of tea product; therefore, value chain concepts and value chain approaches for the general tea sector are discussed, as this forms the closest comparison to the pickled tea industry.

2.2 Context

2.2.1 Tea

Tea is a beverage made by processing the leaves of a plant, *Camellia sinensis* (Hills, 1998). It is known to be the most consumed drink after water (Muktar & Ahmad, 2000; Walter & Wiederecht, 2006) and one of the oldest medicinal beverages in the world (Dufresne & Farnworth, 2000). According to Kindon-Ward (1950), tea originated within the fan-shaped area extending from the Assam/Burma border in the west of China to the east, then south from this line through Burma and Thailand to Vietnam. Hicks (2001) also stated that even though China is credited with introducing tea to the world, the evergreen tea plant is in fact native to southern China, northern India, Myanmar, and Cambodia.

There are two main varieties of tea: *C. sinensis* var. *sinensis* (China tea), which predominates in China, Japan and Taiwan; and *C. sinensis* var. *assamica* (Assam

tea), widely grown in South and Southeast Asia (Adiwinata et al., 1989). Tea plants are highly sensitive to changes in growing conditions and therefore the production is limited to a few areas of the world (Carr, 1972). They grow best in tropical and subtropical areas with adequate rainfall, good drainage, and slightly acidic soil (Awasom, 2011). Its specific requirements are temperatures ranging from 10°C to 30°C, minimum annual precipitation of 1250 mm, and high elevations up to 2000 m (Graham, 1983). In plantations, tea is planted at a density of 5000-10,000 plants per hectare and maintained as low shrubs of 1-1.5 m in height through regular pruning during harvesting (Chan et al., 2007).

2.2.2 World Tea Production

Drawing from the Food and Agriculture Organization Corporate Statistical Database (FAOSTAT) in 2013, world tea production increased significantly by 6% due to the increased output of the major tea-producing countries in Asia and Africa, with an increase in other tea-producing countries in the Middle East, Latin America and the Caribbean. Over the years, India had always dominated global tea production, until 2006 when China boosted its tea production. In 2013, 5.07 million tonnes of tea were produced worldwide, with China having the largest tea production of 1.9 million tonnes, accounting for 38% of global tea production. This is followed by India, the second-largest producer, with 1.2 million tonnes, and Kenya and Sri Lanka with 436,300 tonnes and 343,100 tonnes respectively. Production in other Asian countries such as Indonesia and Bangladesh also showed increases in tea output, with the exception of Vietnam, which showed a 7.5% decline. Tea production has also risen in Africa, with slight increases in Burundi, Zimbabwe and South Africa (see *Table 1*).

Table 1: **World Tea Production (thousand tonnes)**

	2006-08	2009	2010	2011	2012	2013
WORLD	**3891.2**	**4040.0**	**4364.7**	**4627.0**	**4784.5**	**5063.9**
Far East	**2892.3**	**3089.7**	**3280.3**	**3579.1**	**3573.3**	**3965.6**
Bangladesh	56.8	60.0	60.0	59.6	62.5	66.2
China (Mainland)	1150.5	1344.4	1475.1	1623.2	1789.8	1924.5
India	986.4	982.1	970.3	1119.7	1129.0	1200.4
Indonesia	150.3	156.9	156.6	150.8	150.9	152.7
Sri Lanka	311.3	291.2	331.4	327.5	328.4	343.1
Vietnam	158.0	177.3	192.0	202.1	200.0	185.0
Others	78.9	77.8	94.8	96.2	92.7	93.8
Africa	**535.9**	**520.5**	**616.1**	**591.7**	**580.2**	**649.5**
Burundi	6.6	6.7	6.9	7.0	8.7	8.8
Kenya	345.2	318.3	403.3	383.1	373.1	436.3
Malawi	44.9	52.6	51.6	47.1	42.5	46.5
Rwanda	19.1	20.5	22.2	24.1	24.7	25.2
South Africa	3.5	2.0	2.1	2.2	2.2	2.5
Tanzania	32.6	32.1	31.6	33.0	32.3	32.4
Uganda	42.4	51.0	59.4	56.3	57.9	58.3
Zimbabwe	12.4	7.3	8.6	8.4	8.5	8.5
Others	29.0	30.0	30.2	30.6	30.4	30.9
Latin America and Caribbean	**97.7**	**89.8**	**107.4**	**107.8**	**98.3**	**95.0**
Argentina	79.6	73.4	90.7	91.2	81.3	78.9
Brazil	8.5	7.6	7.7	7.7	7.8	7.0
Others	9.7	8.8	8.9	8.8	9.2	9.1
Near East	**255.2**	**238.2**	**262.0**	**251.1**	**251.5**	**253.5**
Iran, Islamic Rep.	41.4	39.6	27.0	29.5	26.5	26.5
Turkey	213.7	198.6	235.0	221.6	225.0	227.0
Oceania	**7.1**	**7.2**	**7.2**	**6.6**	**6.4**	**6.5**
Japan	**94.7**	**86.0**	**83.0**	**82.1**	**85.9**	**84.7**
Commonwealth of Independent States	**8.3**	**8.4**	**8.4**	**8.5**	**8.6**	**8.9**
Developed	**113.7**	**103.8**	**101.0**	**99.5**	**103.3**	**102.0**
Developing	**3777.5**	**3936.2**	**4263.6**	**4527.5**	**4681.2**	**4961.0**

Note. From Food and Agriculture Organization Intergovernmental Group (FAO IGG) Secretariat. (2014).

2.2.2.1 World Tea Export

In 2013, the total world export of tea increased 5% from 2012, reaching 1.77 million tonnes. Kenya was the leading tea exporter. Sri Lanka, China, India, and Indonesia have all increased their tea exports, while exports from Bangladesh, Vietnam, Malawi, and South Africa have dropped (see *Table 2*). According to Nasir & Shamsuddoha (2012), this drop in exports is mainly due to an increase in internal demand resulting in increased local auction prices, as well as other external factors.

Table 2: **World Tea Exports (thousand tonnes)**

	2006-08	2009	2010	2011	2012	2013
WORLD	**1570.7**	**1544.7**	**1638.0**	**1674.8**	**1684.0**	**1768.5**
Far East	**1014.0**	**1008.8**	**1036.4**	**1051.9**	**1064.8**	**1077.9**
Bangladesh	7.9	2.1	0.9	1.5	0.6	0.5
Sri Lanka	303.5	279.9	305.8	303.2	306.1	311.0
China (Mainland)	291.0	303.0	302.4	322.6	321.8	329.7
India	200.2	180.5	182.7	205.3	199.1	209.2
Indonesia	91.7	92.3	87.1	75.5	70.1	70.8
Vietnam	108.2	134.1	138.4	122.6	145.0	133.5
Others	11.5	17.0	19.1	21.4	22.1	23.1
Africa	**462.8**	**449.1**	**542.9**	**519.4**	**525.7**	**596.4**
Kenya	301.0	281.1	362.3	347.5	349.9	415.9
Malawi	42.9	46.8	48.9	44.9	41.8	40.5
Zimbabwe	9.1	4.5	5.1	5.7	5.9	5.9
Rwanda	17.4	18.8	21.5	23.2	23.0	23.5
South Africa	5.6	5.3	5.0	2.7	2.8	5.2
Tanzania	26.4	24.2	26.1	27.1	27.8	26.2
Uganda	39.6	47.9	53.7	47.9	52.3	56.7
Others	20.8	20.3	20.3	20.3	22.3	22.5
Latin America and Caribbean	**79.7**	**72.7**	**89.2**	**89.0**	**79.3**	**76.2**
Oceania	**7.0**	**7.8**	**7.4**	**6.7**	**6.1**	**6.6**
Developed	**16.7**	**17.5**	**17.2**	**14.5**	**13.7**	**18.1**
Developing	**1554.0**	**1527.2**	**1665.7**	**1660.2**	**1670.3**	**1750.4**

Note. From FAO IGG Secretariat. (2014).

2.2.2.2 World Tea Consumption

The trend for tea consumption continued to rise in 2013, influenced by the rapid growth in per capita income levels in China, India, and other emerging economies. In 2013, the total consumption of tea increased by nearly 5% to 4.84 million tonnes. China has maintained the highest total consumption of tea, consuming 1.61 million tonnes, while consumption in India also expanded to reach 1 million tonnes in 2013 (see *Table 3*).

Table 3: **World Tea Consumption (thousand tonnes)**

	2006-08	2009	2010	2011	2012	2013
WORLD	**3714.9**	**3916.0**	**4180.3**	**4449.6**	**4626.8**	**4842.1**
DEVELOPED	826.0	792.1	818.8	834.4	827.8	814.8
South Africa	18.8	24.0	25.1	23.5	23.5	22.8
EU	259.7	228.5	230.3	246.6	238.0	242.0
France	14.6	13.9	15.3	14.9	15.1	15.2
Germany	23.2	19.0	24.9	25.9	29.9	28.9
Ireland	9.2	10.7	10.2	8.6	6.7	7.0
Netherlands	13.8	11.8	10.9	14.2	7.0	12.2
Poland	23.7	15.8	17.2	19.8	19.9	15.0
UK	134.0	121.0	119.8	129.3	125.2	116.2
Other EU	41.2	36.2	31.9	33.9	34.2	47.5
Japan	139.4	124.1	124.0	121.9	121.9	119.1
United States	109.6	108.2	123.8	124.6	122.7	127.4
Russian Federation	172.4	176.2	177.8	182.2	173.3	159.1
Others	114.7	107.1	112.7	112.1	125.0	121.6
DEVELOPING	2889.0	3123.9	3361.5	3615.1	3798.9	4027.3
China (Mainland)	867.0	1045.3	1188.5	1314.5	1481.7	1614.2
India	786.9	822.1	818.3	922.2	939.2	1001.4
Turkey	214.6	202.4	241.9	227.4	227.2	228.0
Egypt	81.1	82.3	68.5	95.7	95.4	99.0
Pakistan	107.3	85.7	120.3	126.2	131.3	126.6
Iran, Islamic Rep. of	76.8	86.1	89.6	80.2	80.3	83.4
Indonesia	56.1	56.8	59.9	61.1	63.3	64.9
Bangladesh	46.4	53.7	57.3	59.3	59.5	61.9
Vietnam	25.5	27.5	27.9	29.3	30.3	31.7
Morocco	51.4	54.8	53.9	65.0	54.1	56.7
Kenya	17.3	18.1	18.7	20.0	23.0	26.6
Others	558.6	589.0	616.6	614.2	613.7	632.9

Note. From FAO IGG Secretariat. (2014)

2.2.2.3 World Tea Prices

According to the FAO Tea Composite Price, which is an indicative price for black tea, international tea prices has consistently increased from 2002 to 2012 (see *Figure 1*). In 2013, the average price dropped by 2.5% to US$2.79 per kg, and continued to drop further to US$2.65 per kg in 2014. The Food and Agriculture Organization Intergovernmental Group (FAO IGG) Secretariat stated that the decline in tea price in 2013 and 2014 was exclusively due to the weak prices for Crush, Tear and Curl (CTC) tea while Orthodox tea prices increased firmly, underpinned by strong demand in traditional orthodox tea.

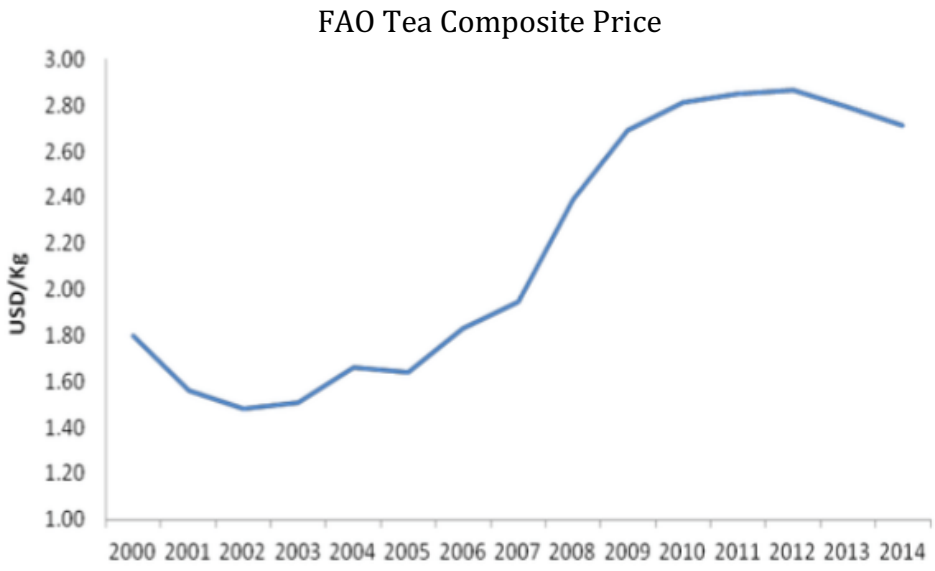


Figure 1: FAO tea composite price (Food and Agriculture Organization Statistics (FAOSTAT), 2015).

2.2.3 Tea in Myanmar

Myanmar is one of several Asian countries that have cultivated tea since the early nineteenth century (Naing, 2011). In Myanmar, tea production is thought to have originated from the Palaung people on the Shan Plateau, parts of which are more than 6000 feet above sea level (Milne, 1924).

Palaung is one of the oldest hill tribes in Myanmar (Howard & Wattana, 2001). Palaung people refer themselves as *Ta-ang* (Leach, 1964) and are also known as *Tai Loi* or *Kun Loi*, meaning a kind of person who follows a lifestyle typical of Tai speaking groups (such as Shan, Lao and Thai); lives in the lowlands; and practices Buddhism (Enriquez, 1923). Palaung are scattered throughout Shan State. Others are located in Yunan province in China and in Chiang Mai province in Thailand (Naing, 1962). They have their own language and literature, a distinctive *Ta-ang* (Palaung) traditional culture, and their own territory (Milne, 1924). British reports from the late nineteenth century noted that the Palaung were the first in Myanmar to cultivate tea (Maule, 1991).

Burmese legend suggests that tea was first introduced into the country by King Alaungsithu of Pagan (1112-1167) who gave tea seeds to the people to cultivate. The people of the region accepted the tea seeds with one hand (*La-ta-phat* in Burmese language) and from there the term *La-ta-phat*, or *Laphet*, was used for tea in Myanmar (see *Figure* 2).

Figure 2: Statue of King Alaungsithu giving tea seeds to the people (located in Mt. Lwal Sal, Northern Shan State)

According to a famous Myanmar poet, U Ponnya (1812-1867), the first tea seeds were given to the Palaung while they were still living in what is now western China over 2000 years ago. Regardless of its origins, the Palaung people have cultivated tea for their livelihood since its introduction. People also began eating tea together with rice in their daily meals. In order for tea to last for longer, they began storing it in pits, where the tea was covered and allowed to ferment, thus discovering pickled tea (Mulae, 1991). Pickled tea is now very common in Myanmar and the word *laphet*, which means "tea", is commonly used to describe pickled tea in the country. Only rarely did people in traditional times drink, rather than eat, tea—drinking tea only became popular in Myanmar in colonial times (Singhanetra-Renard, 2004).

The first tea plant, which is now over a thousand of years old, is still in existence on Mount Lwal Sal in the northern Shan State of Myanmar (see *Figure 3*). In 1937, the British official Maurice Collis visited the original tea tree and commented that "the vale is one vast tea garden", cultivated by Palaung (Maule, 1991).

Figure 3: First tea plant in Myanmar located in Mount Lwal Sal, Northern Shan State.

2.2.3.1 Tea Production in Myanmar

Tea has been cultivated in Myanmar for centuries. The British formalised tea production in the early nineteenth century, as they did in India; however, since independence in 1948, the political situation in Myanmar has not encouraged tea production on any scale (Howard & Wattana, 2001). Opportunities for international exports were also limited in the tea industry as the Myanmar government tightly controlled economic policies which restricted international trade using various trade barriers (Palaung working group, 2011). As a result, smallholders cultivate tea only for domestic consumption.

Tea production remains relatively low compared to major tea-producing countries like China, India, and Kenya. However, according to the FAOSTAT (2012), tea

production in Myanmar has increased from 10,900 tonnes in 1991 to over 30,000 tonnes in 2012 (see *Table 4*).

Table 4: **Tea Production in Myanmar**

Year	Production (tonnes)	Yield (Hg/Ha)	Area harvested (Ha)
2000	19000	2839.72	66908
2001	21300	3174.98	67087
2002	22800	3311.4	68853
2003	22840	3225.99	70800
2004	24640	3435.97	71712
2005	25000	3453.04	72400
2006	26000	3513.51	74000
2007	27700	3639.95	76100
2008	29000	3771.13	76900
2009	30255	3880.09	77975
2010	31060	3944.33	78746
2011	31000	3943.82	78604
2012	32000	4050.63	79000

Note. From Food and Agriculture Organization Corporate Statistical Database (FAOSTAT), 2012.

Starting in 2000, the government began to encourage tea production as a means of eradicating opium poppy fields. They did this by distributing seeds, introducing modern varieties, and by providing a regular pest and disease monitoring service for tea fields. This increased the average annual yield of tea from 0.31 tonnes/ha in 2000 to over 0.45 tonnes/ha in 2012 (FAOSTAT, 2014).

A large number of small and marginal farmers, especially those living in the hilly regions of Myanmar, depend on tea for their livelihood. According to the Union of Myanmar Federation of Chambers of Commerce and Industry, commercial cultivation of tea in the Shan State and Chin State accounts for 90% of total tea

production, with the remaining 10% of production in Sagaing, Mandalay, and Magway divisions and in Kachin, Kayah, Kayin, and Mon States (see *Figure 4*).

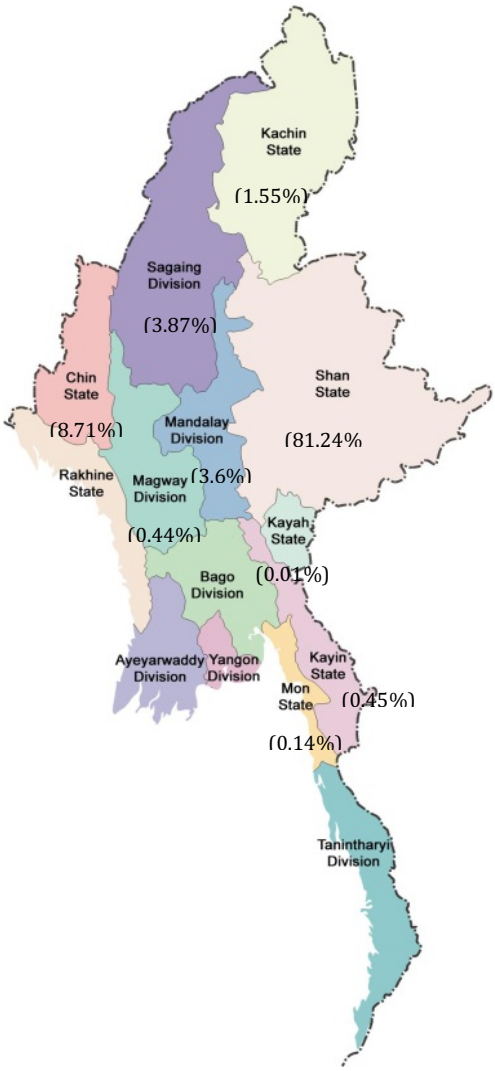


Figure 4: Tea producing areas in Myanmar *(Note: Myanmar Department of Agriculture and Irrigation, 2013).*

In Myanmar, there are three types of tea variant: green tea, black tea, and pickled tea. Green tea accounts for 56% of total tea leaf production; black tea is 28%; and pickled tea is 16%. In terms of production, green tea accounts for 22%, black tea 19.44%, and pickled tea for 85% (see *Table 5*). Green tea and black tea are

produced for domestic consumption by growers, government, and private companies on both a small and medium scale. Pickled tea is largely produced for domestic consumption in the form of pickled tea leaf salad, and it is produced only on a small scale but has a substantially higher value.

Table 5: **Tea Production of the Different Types of Tea in Myanmar in tonnes.**

Year	Yield (fresh green leaves)	Black tea production		Green tea production		Pickled tea production		Total Yield
		Usage of Fresh green leave for black tea production	Black Tea Production	Usage of Fresh green leave for green tea production	Green Tea Production	Usage of Fresh green leave for pickled tea production	Pickled Tea Production	
2000-2001	62459	34977.0	7695	17488.5	3400	9994.0	8494	19589
2001-2002	64303	36009.6	7922	18004.8	3500	10288.6	8745	20167
2002-2003	69796	39085.7	8599	19542.8	3799	11167.5	9492	21890
2003-2004	74239	41573.8	9146	20786.9	4041	11878.3	10097	23284
2004-2005	77092	43171.5	9498	21585.7	4196	12334.8	10485	24179
2005-2006	80545	45105.2	9923	22552.6	4384	12887.2	10954	25261
2006-2007	84348	47234.9	10392	23617.4	4591	13495.7	11471	26454
2007-2008	88078	49323.7	10851	24661.8	4794	14092.5	11979	27624
2008-2009	91397	51382.0	11260	25591.1	4975	14624.0	12430	28665
2009-2010	93963	52619.3	11576	26309.6	5115	15034.1	12779	29470

Note. From Myanmar Department of Agriculture and Irrigation (2012).

2.2.3.2 Price Comparison of the Different Types of Tea in Myanmar

Prices of tea vary depending on the type and flavour. According to the Myanmar Tea Association, 1 kg of fresh green leaves is equal to 0.75 kg of pickled tea and

0.25 kg of green tea or black tea. This means that it takes about 4 kg of fresh green tea leaves to make 1 kg of green or black tea, whereas only 1.3 kg of fresh green tea leaves are required to make 1 kg of pickled tea. The price of pickled tea is significantly higher than other types of tea due to the high level of value addition, despite the fact that fewer tea leaves are required to make pickled tea. This is due to the cost of processing.

The high fluctuation in the prices of the different types of tea is dictated by the unstable market conditions in the Myanmar tea sector (see *Figure 5*). *Table 6* represents the prices of the different types of tea in Myanmar.

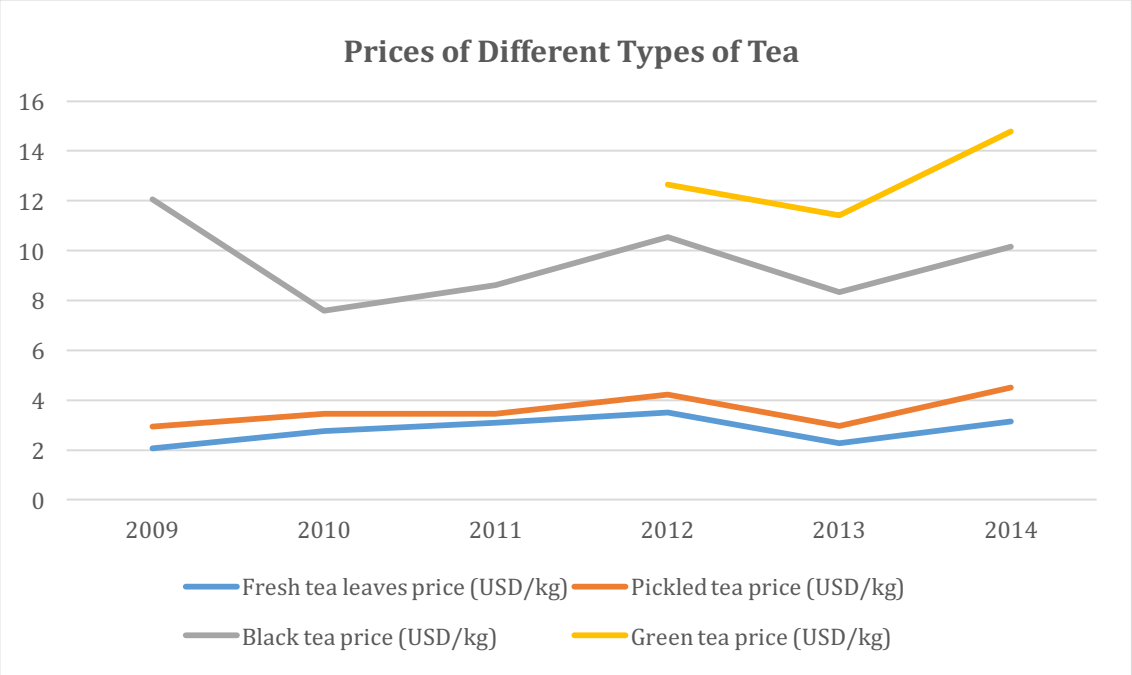


Figure 5: High fluctuation in the prices of different types of tea in Myanmar.

Note. From Myanmar Tea Association (2015).

Table 6: **Prices of Different Types of Tea in Myanmar**

	Fresh tea leaves price (USD/kg)	Pickled tea price (USD/kg)	Black tea price (USD/kg)	Green tea price (USD/kg)
2000	0.84			3.96-4.29
2001	0.63-0.68			3.17-3.50
2002	0.68-0.78	0.95-1.05		4.22-4.39
2003	0.70-1.05			5.25-5.95
2004	0.95-1.16	1.76		6.70
2005	1.14	1.86		7.38
2006	1.38-1.73	2.42-2.59		8.99-9.68
2007	1.73-2.94		17.98	13.14-15.22
2008	3.45-3.79		16.55	15.51-17.93
2009	2.07	2.93	6.90-10.34	12.07
2010	2.76	3.45	7.58	
2011	3.10	3.45	8.62	
2012	3.51	4.22	10.54	12.65-16.87
2013	1.19-2.14	2.97	8.33	11.42
2014	1.80-2.71	4.51	10.15	8.80-11.95

Note. From Myanmar Tea Association (2015).

2.2.3.3 Marketing and Trade of Tea in Myanmar

Tea is a high value product that Myanmar is already exporting. The Myanmar tea industry has been making its way into the global tea market and the prospect of exporting more tea looks promising because western countries have lifted economic sanctions and the government has committed to supporting foreign trade (USAID, 2013). The government has started to concentrate more on the export of tea. Even though exports have steadily increased from 307 tonnes in 2002 to 569 tonnes in 2011 (FAO, 2012), tea production has been steady and relatively controlled (see *Table 7*).

Table 7: **Export and Import of Tea in Myanmar**

Year	Export quantity (tonnes)	Export value (1000 USD)	Import quantity (tonnes)	Import value (1000 USD)
2000	0	0	600	325
2001	0	0	540	650
2002	307	97	744	903
2003	548	142	1310	1664
2004	392	214	1987	2899
2005	612	267	1624	2714
2006	508	327	768	1061
2007	688	565	1114	1604
2008	412	627	1609	2345
2009	729	946	2392	4178
2010	579	884	2701	6886
2011	569	807	2295	7282

Note. From Food and Agriculture Organization Corporate Statistical Database (FAOSTAT), 2012.

Myanmar's tea export performance does not have a major effect on world prices because the overall amount is very low compared to leading exporting countries such as China, India, Kenya, and Vietnam. A report from Tea 2030 (2014) stated that Myanmar has a comparative advantage in tea production as the pressure on land availability globally has led the tea sector to search for new places to grow tea, with tea growing shifting to new countries like Congo and Myanmar. Myanmar's tea exports are mainly in the form of bulk tea (raw material/commodity tea) with the value-adding processing—such as packaging, quality checks, and health checks—done in other countries. However, no official

exports of pickled tea have been established yet in Myanmar. Therefore, pickled tea has only been exported unofficially, by individual families or stores.

2.2.4 Varieties of Tea

There are various types of tea in the global tea market, with the major types being non-fermented/aerated green tea, semi-fermented (oolong) tea, and fermented black tea (Reeves et al., 1987). However, different processing techniques and growing conditions have allowed for the diversification of tea into specialty teas such as white tea, flavoured teas, decaffeinated tea, herbal teas, organic tea, and various blends (Karori et al., 2007). There are other types of pickled tea besides *laphet*, such as *Miang* from the northern provinces of Thailand (LeBar, 1967; Phromrukachat et. al., 2010) and *Miam* or *Suancha* from the southern part of Yunan district in China (Chu, 1997). These teas are made from tea leaves which are fermented into a pickle and processed into an edible form.

2.2.4.1 Consuming Ways of Pickled Tea

Burmese pickled tea can be eaten in two ways. The first way is traditionally served in a lidded shallow lacquerware tray called a *laphet ohk*, which is divided into small compartments. Pickled tea is dressed with sesame oil in a central compartment, and is surrounded by other ingredients such as crispy fried garlic, peas and peanuts, toasted sesame seeds, crushed dried shrimp, and preserved shredded ginger (see *Figure 6*).

Figure 6: Pickled tea leaf samples in a lacquerware tray (Ord, 2013).

The second way to prepare pickled tea is as a green tea salad, typically by mixing the same ingredients as above, but also possibly include tomatoes, green chilli, shredded cabbage, or a squeeze of lime (see *Figure 7*).

Figure 7: Pickled tea leaf salad (Honn, 2014)

Pickled tea can also be eaten as a snack. According to research on popular snacks conducted by Aung et al. (2005), pickled tea leaf salad was found to be one of the most-consumed midday snacks in Myanmar. It was also found to contain the highest protein content among other traditional snacks because it is combined with a variety of beans in the salad. Their study also pointed out that traditional

Myanmar snacks are more nutritious and healthier, as well as cheaper, compared to Westernised snacks.

2.2.4.2 Health Benefits of Tea and Pickled Tea

Tea is a popular beverage which has been widely consumed around the world for many years because of its attractive aroma, exceptional taste, and its health promoting and pharmaceutical potential (Gramza-Michalowska, 2014). Even though there have been some studies that have suggested there are disadvantages to drinking tea, most studies support the idea that there is no harm in drinking too much tea and that tea consumption is associated with positive health impacts (Vuong, 2014). Various studies have investigated the roles of tea constituents in human health and found that the major tea constituents, including flavonoids, caffeine, and thiamine, are linked to various health benefits (Graham, 1983; Khan & Mukhtar, 2007; Basu et al., 2010). Chacko et al., (2010) did a review on the beneficial effects of tea and stated that tea can protect against several diseases, including cardiovascular diseases, cancer, and dental and bacterial infections. It has also been asserted that eating tea can increase lifespan for many years (Trevisanato & Kim, 2000).

According to a study conducted by Maung et al. (2012), pickled tea contains high polyphenols which are beneficial for human health. Studies conducted by Yang et al., (1993, 1999) have proven that tea polyphenols have the ability to inhibit tumour formation in the lungs, skin, oesophagus, stomach, liver, duodenum, small intestine, and pancreas in animal models Moreover, in a case-control study conducted in Taxiing Jiangsu province in China, it was reported that drinking green

tea decreased liver cancer by 78% among alcohol drinkers and 43% among cigarette smokers due to tea polyphenols and pigments in tea (Mu et al., 2003).

Another study conducted by Maung and He (2013) showed that pickled tea contains double the amount of flavonoid contents as fresh tea leaves. They also found that all tea products from the *Camellia sinensis* plant, such as black, green, oolong, and white teas, naturally contain between 100-300 mg of flavonoids per serving. Flavonoids are dietary compounds which contribute significantly to taste and colour, as well as helping to maintain certain body functions including anti-allergy, anti-inflammatory, antiviral, anti-proliferative and anti-carcinogenic activities (Yao et al., 2004). Khan and Mukhtar (2007) review the recent findings on the medicinal properties and health benefits of tea with special reference to cancer and cardiovascular disease. Their review stated that tea catechism is one of a fraction of flavonoids that may reduce the risk of skin cancer, liver cancer, lung cancer, gastrointestinal tract cancer, pancreatic cancer, bladder cancer, and breast cancer. Therefore, it can be stated that pickled tea has the potential to prevent many health problems.

2.2.5 Changing Consumer Demands

In the last few years, there have been many changes in consumer demand, lifestyles, and eating patterns driven by demographic shifts, economic factors, rising ethnic diversity, and consumers' evolving tastes and preferences (Kinsey & Senauer, 2006). Nowadays, consumers are becoming more aware of quality, food safety, nutritional benefits, convenience, and animal and environmental welfare (Huang, 1996; Abdalla & Shaffer, 1997).

There has been an increase in purchases of food which require minimal preparation as consumers have moved their preferences to convenient "mealtime solutions" (Kinsey, 1998); coupled with increased demand for products that enhance health benefits, are low in fat and calories, and help to lower cholesterol (Davis & Stewart, 2002). This suggests there is potential for growth in the pickled tea market.

2.3 Value Chain Concept

Value chain is a market-oriented approach that can be used to explain and find ways to overcome the trade barriers faced by the rural poor (Mitchell et al., 2009). This approach has been used in this study to examine the pickled tea industry in Myanmar as it provides an overall view of the pickled tea chain from conception to consumption. In addition, this study focuses on identifying the weaknesses and opportunities in the chain that have an impact on tea productivity.

A "value chain" is the collection of activities that a firm performs in order to design, create, build, and deliver a valuable product or service to the market (Porter, 1985). It describes the full range of value-adding activities that participants undertake to bring a product or service through the different stages of production (involving procurement of raw materials and other inputs, assembly, physical transformation, acquisition of required services such as transportation) to deliver the product to its final consumer (Kaplinsky & Morris, 2001; Pietrobelli & Saliola, 2008). Porter (1985) indicated that value can be created by product differentiation through activities and services along every step of the value chain. These activities

include production, marketing, distribution, and support to the final consumer (Cunningham, 2001). The product reaches the final consumer having passed through a number of intermediaries, each of whom is said to add value to the final product (Kaplinsky, 2000). Therefore, the total value delivered by the participants at the end is the total sum of the value builds up throughout the chain, and the end customer pays the total price for the final product including a certain amount of profit (Fredendall & Hill, 2001).

A value chain resembles a supply chain in that both chains provide goods or services to the final consumers (Handfield & Nichols, 2002). However, the key in the concept of value chain is the idea of value addition or value creation – typically by means of innovation in products or processes and marketing (Webber and Labaste, 2010). This is what distinguishes "value chains" from "supply chains" which focus on the logistical aspects of a commodity transfer (Dunne, 2001). In addition, a value chain incorporates product transformation and value addition at each stage of the chain (Sanogo, 2010). The chain of activities as a whole gives the product more added value than the sum of independent activities (Hempel, 2010).

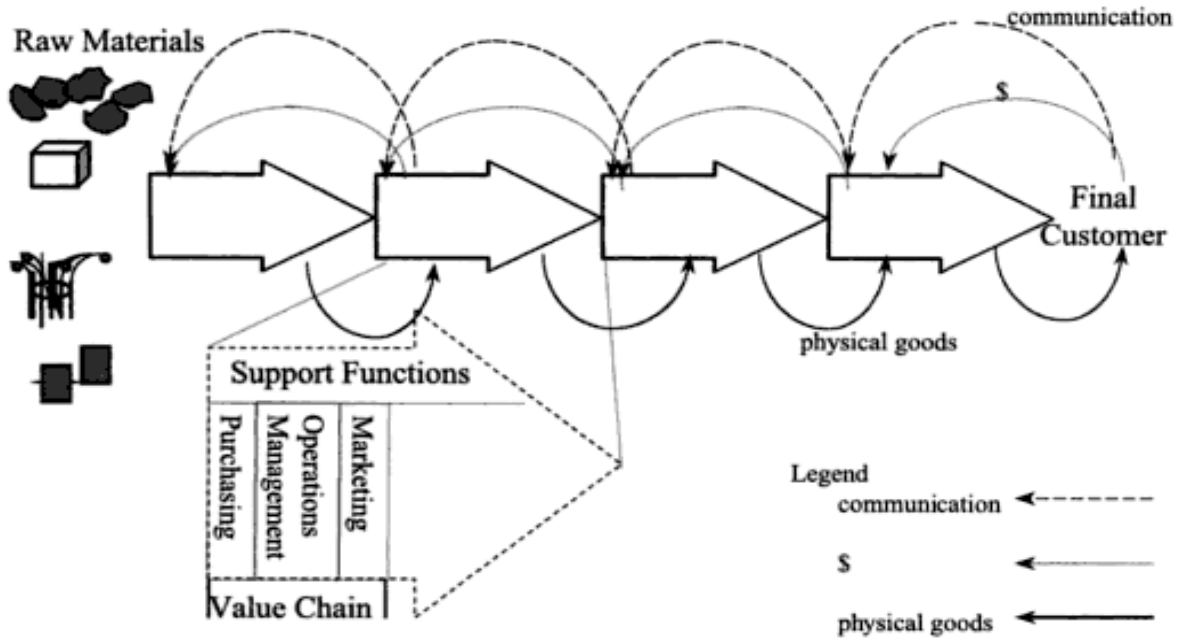


Figure 8: Supply chain and value chain (Fredendall & Hill, 2000).

Figure 8 illustrates the difference between a supply chain and a value chain. The diagram shows the supply chain as a sequence of arrows moving from raw materials to the final customer, passing through different phases. Each phase states an individual firm adding value by performing own value chain activities. However, in this diagram only one firm demonstrates the core function for value addition in the overall supply chain. In the example, marketing, operations management and purchasing are shown as the added value to the chain. In general, each firm in the supply chain network has their own internal functions that add value to the product or service until the end of the supply chain (Fredendall & Hill, 2000).

A successful value chain depends on the relationships between the members and the attitude of the participants; this leads to improvement in efficiencies and

greater value creation (Ilyas et al., 2007). The communication from the final consumer is also important for the successful flow of the physical goods throughout the chain (Fredendall & Hill, 2000). In 1990s, Gereffi developed the global commodity chain, which concluded that the overall character of many value chains are characterised by the dominant participants of the chain which are responsible for upgrading possibilities, transfer of knowledge, and interaction coordination within the value chain (Humphrey, 2004). According to Bammann (2007), there are three important levels of the value chain:

1. Value chain participants: participants in the chain who deal directly with the product (i.e. producers, processors, traders, etc.).
2. Value chain supporters: actors who do not deal directly with the product, but who provide services which add value to the product (i.e. input suppliers, industry associations, researchers).
3. Value chain influencers: actors or services which have a big impact or influence on the product (i.e. the regulatory framework, policies, policy makers, infrastructure).

2.3.1 Value Addition and Value Chain Upgrading

This value addition to a product is the firm's competitive advantage to establishing the goal to deliver the product with maximum value to the end user for the least possible total cost to the company, thereby maximizing profit (Porter, 1985). Porter (1985) distinguished two important value-adding activities of an organization: primary activities (inbound logistics, operations, outbound logistics,

marketing, and sales), and support activities (strategic planning, human resource management, technology development, and procurement).

The size of the value added depend on the end customers' willingness to pay and the opportunity to add value depends on various factors such as market characteristics and technological capabilities of the actors (Trienekens, 2011). According to Kaplinsky (2000), participation in global value chains aiming at markets which demand products with high added value is required in order to access high income yielding activities, with high added value.

For specialty products, branding and adding additional value has become a conditional strategy to gain market share (Gereffi1999). This branding and labeling, however, is constrained for developing countries producers due to the private-label policies of many Western supermarket chains (Seth & Randall, 2005).

Safety and quality of the product is also highly focused value added food products (Holleran et al., 1999). Quality can be defined in terms of intrinsic characteristics (e.g. color, taste, and tenderness) of the product itself and extrinsic characteristics (e.g. organic or fair trade production) of the process which cannot be measured on the product (Trienekens, 2011). To safeguard the quality and safety of end-products, since the 1990s, Western retailers have defined various standards for the production and processing of food and because of these standards access to these markets for small and medium size producers is difficult and in many cases impossible (Dolan and Humphrey, 2000). Certification according to these standards implies high costs for producers and also high monitoring costs for buyers (Jahn et al., 2004). Although, in some cases, there is now an inclusion of

small- holders in modern quality schemes either through cooperative governance forms or through retail or food industry programs (e.g. tea production in Kenya for Unilever; coffee production for *Nescafe* in Brazil) (Trienekens, 2011).

Upgrading of value added in products is related to (potential) demands in a market (Laufenberg et al., 2003). Pietrobelli and Saliola (2008) define the following upgrading options: entering higher unit value market niches, entering new sectors, undertaking new productive functions and in all cases enlarging the technological capabilities of the firms. Trienekens (2011) describes the upgrading of value added production is various forms; upgrading of products (and packaging), upgrading of processes, functional upgrading (insourcing production or distribution functions) and inter-sectorial upgrading (where chain actors introduce value adding processes from other sectors to offer new products or services: e.g. a farmer who enters into tourism activities).

Product differentiation is another means of value creation to upgrade the value chain (Priem, 2007). However, it is not very suitable for the upstream part of the value chain in food production, as in most food chains heterogeneity of raw materials upstream in the value chain is not exploited for serving market heterogeneity downstream in the chain (Trienekens, 2011). Raw materials are first made homogeneous and are differentiated again in processing and distribution stages (e.g. through packaging), because of the high costs of separating and controlling various materials flows upstream in the chain (Grunert et al., 2005). Therefore, in many cases the upstream part of the value chain is located in developing countries explaining why only little value added production in these chains takes place in developing countries in international value chains

(Trienekens, 2011). This however, creates an opportunity for specialization in fair trade and organic products from developing countries.

The study conducted by Choudhry & Lister (1997) addressed a number of problems with respect to product differentiation. They stated that the weak differentiability of a product in the global market, for example tea, will increase competitive intensity among rival tea-producing countries. Fonseka (1997) also stated that the intense rivalry among existing firms in Sri Lanka is also due to lack of differentiation. Pickled tea however, is a form of tea that is eaten and not drunk in most cases so this may provide sufficient product differentiation to stand out in the global food market. Trienekens (2011) also stated that for traditional commodity chains there is an increasingly tendency for production differentiation.

2.3.2 Value Chain Study Approaches

Value chain analysis (VCA) normally describes the weak linkages and identifies many potential upgrading strategies (Anadajayasekeram and Gebremedhin, 2009). Kaplinisky and Morris (2002) argue that there is no correct way to conduct a value chain analysis; rather, the approach taken fundamentally depends on the particular question. In this study, the approach suggested by Kaplinsky and Morris (2001); Van dan Berg (2004); Herr and Muzira (2009) in analysing agricultural commodity has been adopted. This comprises four aspects of the value chain analysis.

- **Value chain mapping**

  VCA maps the actors participating in the value chain (production, distribution, processing, marketing and consumption). This helps to

understand the characteristics of the chain participants and the relationships among them, including the flow of product through the chain to its destination of either the domestic or foreign markets.

- **Identifying the distribution of benefits of actors in the chain**

  VCA defines the margins and profits within the chain to determine who benefits from participating in the chain and who requires support to improve performance. This is important in the context of developing countries and agriculture in particular given that the poor are vulnerable to the process of globalization.

- **Examining the role of upgrading within the chain**

  VCA examines the role of upgrading within the chain by identifying the constraints and weaknesses. Upgrading involves improvement in quality, product design which enable the producers to gain higher value or through product differentiation. An analysis of the upgrading process includes an assessment of the constraints that are currently present for the chain actors.

- **Role of governance in the value chain**

  VCA also describes the governance role which supports participants in the value chain. Governance in a value chain refers to the structure of relationships and coordination mechanism between actors in the value chain. This is important in improving capabilities and increase value addition in the sector and corrects distributional distortions.

2.3.3 Value Chain Approach for Agricultural Products

Various studies have applied value chain concepts to agricultural commodities (Humphrey & Memedovic, 2006; Cromme et al., 2010; Emana, & Nigussie, 2011; Woldegiorigis, 2011; Wang, 2012; Woldesenbet, 2013). The concept of agricultural value chain includes the full range of activities and participants involved in moving agricultural products from input suppliers to farmers' fields linking to the next stakeholder and finally to the consumers in order to form a viable chain (Singh et al., 2013). Food value chains comprise all activities required to bring farm products to consumers, including agricultural production, processing, storage, marketing (including exports), distribution, and consumption (Gomez et al., 2011). Value addition results from a wide range of activities; for a typical agricultural value chain; this would involve production, transporting, processing, trading, retailing, and consumption (Anandajaysekeram & Gebremedhin, 2009). Value chains are also channels for which finance (credit, revenues, and capital) moves from consumers to producers; technologies, trainings and assistance are disseminated among producers, traders, processors and transporters; and information on consumer preference and demand are transmitted from consumers back to producers, processors and other service providers (see *Figure 9*).

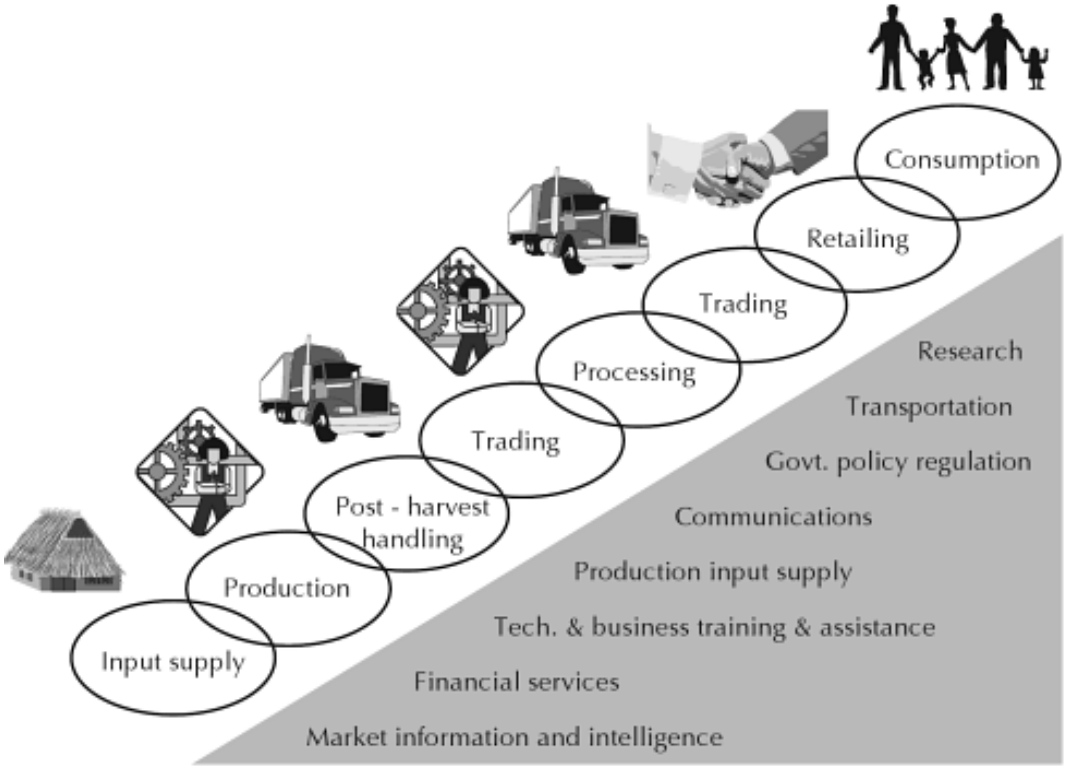


Figure 9: Typical agricultural value chain and associated business development services (Anandjaysekeram & Gebremedhin, 2009)

It has been argued that linking of farmers to the markets through efficient value chains would reduce the use of intermediaries in the chain, and strengthen the value adding activities by better technology and inputs, upgraded infrastructure and processing and exports (Miller & Jones, 2010; Pabuayon et al., 2009). Emana & Nigussie (2011) stated that it is also important to link value chain with innovation system perspective in agricultural research for development so that one re-enforce the other.

Farmers involved in the supply chain functions have less negotiating power and make little money having to incentive for improving their product and this creates a great deal of risk for the traders who buy only low-quality produce (Emana &

Nigussie, 2011). However, Faida (2006) stated that if farmers can negotiate a deal with a trader who buys a certain amount of high-quality product and the trader in turn has a contract with the end users/ consumers, this makes the chain to function smoothly and develops a sense of benefiting all actors from having a smooth supply of top quality products in a sustainable manner. This function through which each actor is prepared to invest and support other actors to maximize the benefit from the chain performance is known as a value chain.

A study of the potato value chain conducted by Joshi & Gurung (2009), analyzed the context of potato production, mapped chain actors and were able to identify the factors affecting value chain and chain relationships. The farmers identified seasonality in demand and inconsistent price information as major marketing problems. Wang (2012) conducted a value chain study on organic vegetables and discussed product upgrading to bring new varieties of products, process upgrading to shift to anti-season vegetable and improve the deep processing, functional upgrading to integrate the actors and functions in the chain and build the producer oriented structure to shorten the link before producers and consumers. She also suggested contract farming in order to share more profit from the emerging and increasing organic market and to overcome the cost for certification and improve bargaining power and access to market.

Similarly, a potato value chain study conducted in Kenya has shown that contract farming can be used to reduce transaction costs and risks, and to improve the organization and governance of value chains by creating stable business relationships (Kirumba et al., 2004). The study also indicated that potato value chain is constrained by a number of market and institutional failures. The potato

chain in Kenya is fragmented, characterized by little cooperation and integration, high transaction costs, large number of middlemen in the marketing system, poor product handling and packaging, price inefficiencies and quality losses. The study recommended short-term and long term infrastructural and institutional innovation to reduce the above challenges.

In the maize value chain analysis study conducted by Woldegiorigis (2011), the importance of cooperatives was also highlighted to improve bargaining power, reduce transaction cost for farmers to get higher, stable income to ensure food security. Ponte (2002) also used a value chain analysis to explain the impact of market liberalization and deregulation and examines the effect of new consumption patterns and evolving corporate strategies in the global coffee chain on coffee exporting countries. It was concluded that the coffee chain was becoming buyer-driven and the study recommended to promote regulations requiring buyers to pay higher price for higher quality coffee and to facilitate the establishment of farmer groups and producer associations and of direct links between them and consumers.

Value chain studies are also used to identify the weak points in an industry (Lambert & Cooper, 2000). Kindeya (2010) identified the major constraints to the production and supply of butter and then analyzed the production and marketing support services such as extension, credit and marketing. The study has shown that the number of extension visits and the amount of credit received has direct positive influence on market participation and sale volume. Similarly, study conducted by Holloway et al. (2000) has also proven that the visits by extension agents improve participation and volume of sales.

2.3.4 Application of Value Chain Analysis on Tea

Value chain analysis can be used to assess the tea industry's competitiveness (Asopa, 2004). Tea production is part of a value chain with strong potential for reducing poverty (Simbua, 2006). Tea is planted mainly by small-scale farmers in poor areas; it requires few inputs; and is labour-intensive (Loconto & Simbua, 2012). Moreover, the risk of crop failure is fairly low (Groosman, 2011). Farmers' incomes can be increased not only by increasing productivity but also through efficient and effective value addition (Trienekens, 2011). The tea value chain involves various stakeholders controlling and adding value along the chain. Value addition to tea is possible through optimising processing, grading, blending, packaging, and branding (Loconto & Simbua, 2012). Similarly, as pickled tea is a unique tea product, value can be added through the processes of processing, grading, packaging and branding.

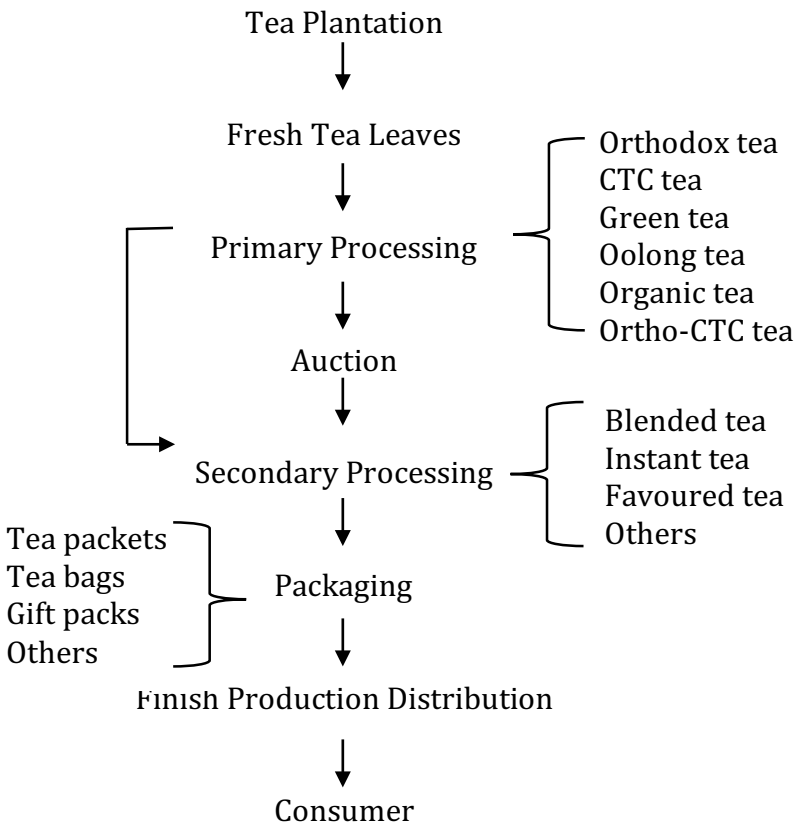


Figure 10: Stages of value-addition to fresh tea leaves (Ariyawardana, 2001).

According to a study conducted by Onduru et al. (2012), which reviewed the value chain of tea production in Kenya, the main challenge faced by tea farmers is the lack of knowledge regarding the value chain of the tea plantation. The tea value chain in Vietnam was analysed by Khoi et al. (2015) with the aim of finding out where value could be added along the tea value chain to increase the livelihood of the poor tea farmers in Vietnam. Their study suggested that farmers should firstly change their cultivation technique with a view to increase tea yield and quality of the tea product. The study also showed labour shortage during seasonal months and improve proper cultivation techniques and the adoption of new technology can reduce the need for labour.

In 2006, USAID has conducted a similar study on tea production in Uganda by mapping the tea value chain in order to quantify the costs of the supply chain. These studies have shown that value chain analysis is important in upgrading the value of a commodity.

Hazarika and Subramanian (1999) explain the technical efficiency of production factors in the tea industry in India using the Stochastic Frontier Production Function Model. Their study concentrates on the productivity and production factors. This study does not adopt a value chain method, which is generally thought of as an essential analytical method for the tea industry.

Odoch (2008) researched the competitiveness of the fair trade value chain in relation to conventional value chains among smallholder tea producers in Kabrole, Uganda. The study concluded that improvement of the fair trade value chain is necessary to strengthen the market function of the organisation. The study also

showed the need for the fair trade value chain processor to introduce measures that counter the influence of conventional middlemen on smallholder farmers, thereby making recommendations to increase the supply of tea leaves in the fair trade value chain. Therefore, fair trade certification could be considered as improving the tea value chain in Myanmar and potentially this might be extended to pickled tea.

CHAPTER 3

METHODOLOGY

3.1 Introduction

There are a wide range of teas available in the global market, including green tea, black tea, white tea, and oolong tea. There are, however, a lot of opportunities in the tea industry that have not yet been explored. Pickled tea, in particular, has not been well studied. This research is exploratory in nature and the purpose is to study the value chain of pickled tea and the potential of the product in the international market. This chapter describes the methodology of the study, including research design, the location of the study area, and the overall research processes including data collection, data analysis, and problems faced in the study.

3.2 Research Design

This research aims to examine the present state of pickled tea production and to suggest improvements to the quality of pickled tea in the value chain.

This study will be in a form of exploratory research, as pickled tea is relatively unknown outside of Myanmar and a very few neighbouring countries. Therefore, this research will not attempt to establish or test any theory or hypothesis. This research study is exploratory in nature as it “generates information about unknown aspects of phenomena” (Teddlie & Tashakkori, 2009, p. 25). In this case, the potential of pickled tea in five international markets—New Zealand, Australia, Singapore, Thailand and the United States—was explored.

3.3 Description of the Study Areas

Field observations for value chain analysis of pickled tea in Myanmar were collected in the Shan State, which is the main tea-producing area in Myanmar with 80% of Myanmar's total tea production grown there. The study was undertaken in Namsan township, in northern Shan State, and in Pindaya township, in southern Shan State. These areas are known to be the two major pickled tea-producing areas within the Shan State (see *Figure 11)*.

Namsan township: Namsan township is one of the main tea producing areas in Myanmar. It is bordered by Thibaw township to the east, Moe Mate township to the west, and Kyout Me' township and Namatu township to the south and north respectively. Data from the Myanmar Settlement and Land Records Department States that the total area of Namsan township is 1444.13 square km (557.58 square miles) and it is comprised of six urban towns and 26 village tracts, with a total of 123 villages. It has approximately 13,213 households, with a population of 77,455, of which the majority of the villagers are tea growers. Namsan township is situated 1625.19 m (5332 ft) above sea level and receives an average rainfall of 76.14 mm per annum. The yearly average temperature ranges from 9°C to 26°C. It has sandy soil with a pH of 4.5-5. Other crops produced in Namsan include rice, maize and vegetables such as radishes and potatoes (Myanmar Department of Settlement and Land Records, 2014).

Pindaya township: Pindaya township is located within the Taunggyi district in the southern Shan State. The Myanmar Settlement and Land Records Department lists 28 village tracts with 137 total villages in Pindaya township, with a population of about 77,183. The total area of the township is approximately 657.86 square km (254 square miles) and it is situated 1182.62 m (3,880 ft) above sea level. It has yearly average temperatures of 9°C to 32°C and receives an average rainfall of 43.70 mm per annum. Tea is one of the major crops grown in the area, but other crops, such as rice, maize, wheat, pulses, potato, oil crops, and spices, are also g rown in the area (Myanmar Department of Settlement and Land Records, 2014).

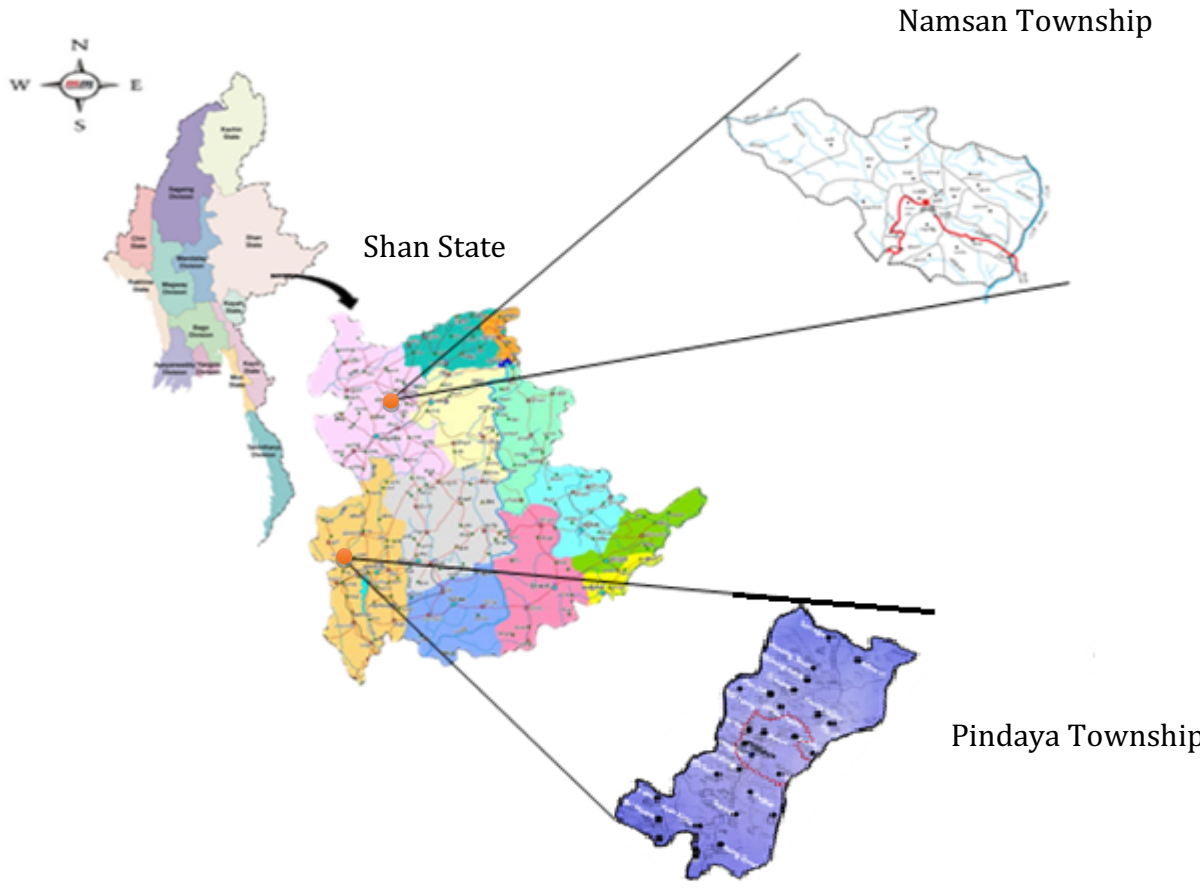


Figure 11: Map of Myanmar showing Shan State and the study areas of Namsan and Pindaya townships.

Wholesalers and pickled tea manufacturing companies located in Yangon and Mandalay were also interviewed. Yangon is the former capital city of Myanmar, but it remains the largest city and main centre for business, industry, trade, real estate and entertainment; while Mandalay is the second-largest city as well as the major trading and communications centre for northern and central Myanmar.

To study the potential of pickled tea in the international market, five countries were selected based on the relatively high population of Burmese migrants living in the country according to UN Census Data (2013). The countries studied were the United States, Singapore, Thailand, Australia, and New Zealand.

3.4 Research Methods

Two types of research methods are widely used in collecting data; namely, quantitative and qualitative methods (Ghauri et al., 1995). Quantitative methods are related to numerical interpretations, where data is collected and transformed into numbers which are tested to see if a relationship can be found so that conclusions can be drawn from the results gained (Bryman & Bell, 2007). On the other hand, qualitative methods do not rely on statistics or numbers and emphasise understanding, interpretation, and observation in natural settings (Ghauri et al., 1995). Poblete & Grimsholm (2010) stated that qualitative methods include less structured protocols and interactive interviews, and produce an overall picture of the results in a more effective way than quantitative methods. In most studies, qualitative methods can either be used alone or in combination with quantitative approaches (Creswell, 2014). Ha (2006) used a qualitative research

method to analyse the tea production industry in Vietnam and was able to identify the factors that encouraged the competitiveness of the Vietnamese tea industry. He also analysed the major changes in the tea industry and defined the main advantages and constraints of the competitiveness of the tea value chain in the economic integration, especially with Vietnam joining in the World Trade Organisation. Moreover, Commins & Sampanvejsobha (2008) also conducted a case study to qualitatively analyse the development of the Thai tea industry.

Therefore, in this research, a qualitative approach has been used to describe the development of the pickled tea value chain in Myanmar. Particular focus was given to the situation of small-scale pickled tea farmers and the distribution of their product in the market. A qualitative approach is more appropriate for this research, as mapping the value chain involves collecting information on the process of material flows, information flows, and relationships within and between participants in the value chain, from tea farmers to the final consumer. However, secondary data have also been used in this research in order to measure the industry growth and assess the potential of pickled tea in the international market. Moreover, given that there has been no studies done on the value chain of pickled tea or even pickled tea in particular, this research will be exploratory in nature.

3.5 Data Collection

The methods used for data collection are from two sources: primary sources where the information is required to be collected and secondary sources where the required information is already available and need only to be extracted (Kumar,

2005). It is appropriate to use both sources to obtain more quality and reliable information for the study (Maylor & Blackmon, 2005).

For the primary sources, Maylor & Blackmon (2005) stated three main methods of data collection; observation, interviewing and questionnaires. Among these three methods, a semi- structured interview is assessed as the most appropriate method to examine the performance of the participants in the pickled tea value chain. This is because interview is the most appropriate approach to study complex and sensitive areas and it is useful for collecting in-depth information as the interviewer can explain complex questions in person to avoid wrong interpretation from respondents (Kumar, 2005).

In this study, the primary data were gathered by interviewing a total of 30 sampled pickled tea farmers: 15 from Namsan township and 15 from Pindaya township. These farmers were selected with the help of locals and extension staff working in the area, as it is difficult to distinguish between tea farmers producing pickled tea and other type of teas, such as green tea and black tea. Face-to-face interviews were conducted with a semi-structural questionnaire. This structural questionnaire involved collecting socio-economic data, such as farmers' ages, education levels, and farming experience, and whether they are members of any tea organisations. In addition, technical data was also gathered, including information on the status of technologies and their availability, institutions and support services used by the farmers, sources of income, and other relevant demographic information. Furthermore, information on the use of chemical fertilisers and tea yield, the processing of pickled tea, storage, marketing information, along with challenges and issues faced by the famers, and their

opinion on the pickled tea sector were collected (see *Appendices*). The survey was conducted through physical visits to respondents' localities and face-to-face oral interviews.

Wholesalers and pickled tea manufacturing companies located in Yangon and Mandalay were also interviewed to form the basic structure of the value chain and the interrelationships in it, as well as to understand the step-by-step value addition of pickled tea. Personal interviews with wholesalers and manufacturing companies were undertaken to find out more about the current situation of pickled tea and the position of their brand in the domestic market, as well as their plans for export. In addition, semi-structured interviews were conducted with government extension staff, members of the tea association, and international organisations, such as Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), which is currently working on certification and exporting of pickled tea. Interviews were used to allow the researcher to obtain information for accurately mapping the value chain of the investigated product and to gain a clear picture of the industry network.

To study the potential of pickled tea in the international market, 30 Burmese restaurants located in New Zealand, Australia, Thailand, Singapore and the United States were interviewed. The interview questions related to the supply and demand side of the product, such as the source of the pickled tea, how the pickled tea was served in the restaurants, major customers and customer preferences, as well as information on price, sale frequency, and certification of pickled tea. These interviews were conducted by personal visits to the restaurants in New Zealand,

Australia and Thailand. Interviews with restaurants in Singapore and the United States were done through phone calls and emails.

Secondary data was obtained from different government agencies, including Myanmar Agricultural Service (MAS), which is now known as the Department of Agriculture (DOA), and Myanmar Agricultural Produce Trading (MAPT), under the Ministry of Agriculture and Irrigation (MOAI); relevant organisations, websites, and tea associations in Myanmar.

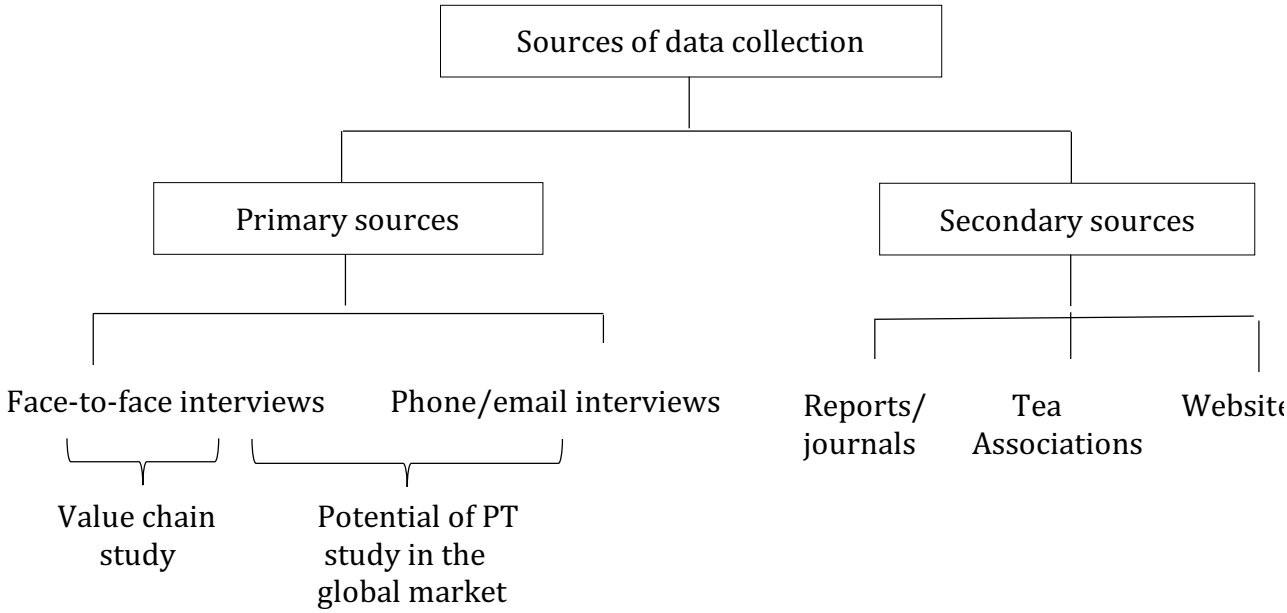


Figure 12: Data collection framework.

The proposed study was to conduct a taste testing of pickled tea in the Manawatu region which is the fourth region with the highest amount of Burmese population in the North Island of New Zealand (Statistics New Zealand, 2014). Three different brand samples of pickled tea are imported from Myanmar to be used in a preliminary taste-testing exercise as part of this research. Groups according to

ethnicity are identified as Burmese, East Asians (mainly Chinese), West Asians (mainly from India, Sri Lanka, Nepal, Bangladesh, etc.), Australian/ New Zealanders, Mori and others. Additional groups are to be included not only to have a broader sample selection but also to obtain data about their acceptance to pickled tea. Blind folded test was to be conducted to eliminate any bias in the result caused by respondents' pre-conceived ideas about the product. Pickled tea was to be sampled on its own and in combination with nuts as a salad.

3.6 Data Analysis

In this study descriptive analysis has been done to analyse the value chain of pickled tea in Myanmar using data collected through a survey with participants from all stages of the value chain.

Value chain analysis was used to analyse the data collected from pickled tea farmers, producers, wholesalers, manufacturers, restaurants, and consumers. As the pickled tea moves through various stages in the chain, transactions take place, where money and information are exchanged between multiple participants and value is progressively added. The proposed steps by Kaplinsky and Morris (2001); Van den Berg (2004); Herr and Muzira (2009) in analysing value chain were applied to this study.

- Mapping the pickled tea value chain and describing the functions of participants in the value chain in the selected intervention sites. Major activities of each participant, product flow and other relevant details were assessed based on the data collected.

- Defining the margins to determine who benefits and by how much from participating in the pickled tea value chain and who will benefit from additional support to be provided.
- Identifying the constraints and weaknesses in order to assist in upgrading the pickled tea value chain.
- Describing the governance role which supports participants in the value chain.

CHAPTER 4

RESULTS

4.1 Introduction

This chapter presents an analysis of the data and discusses the results obtained from the study. It has four main sections: the first section describes the pickled tea value chain, which includes the value chain map, participants and their activities, and roles involved in the value chain. The second section presents the margins and benefit shares of participants as the product moves along the value chain. The third section presents the potential of pickled tea in the international market. The final section deals with pickled tea in the U.S. market.

4.2 Pickled Tea Value Chain

The pickled tea value chain comprises a step-by-step process in which the products progress from cultivation all the way to consumption by final consumer. The major participants in the pickled tea value chain include tea pickers, tea farmers, pickled tea producers/processors, brokers/traders, wholesalers, manufacturing companies, and retailers. The value chain progresses in stages, from production (pruning, picking), to processing (steaming/boiling, pressing, cooling/spreading, rolling, mixing), storage, distribution, wholesale, retail, and consumption; where each stage adds value to the tea leaves along the chain (see *Figure 13*).

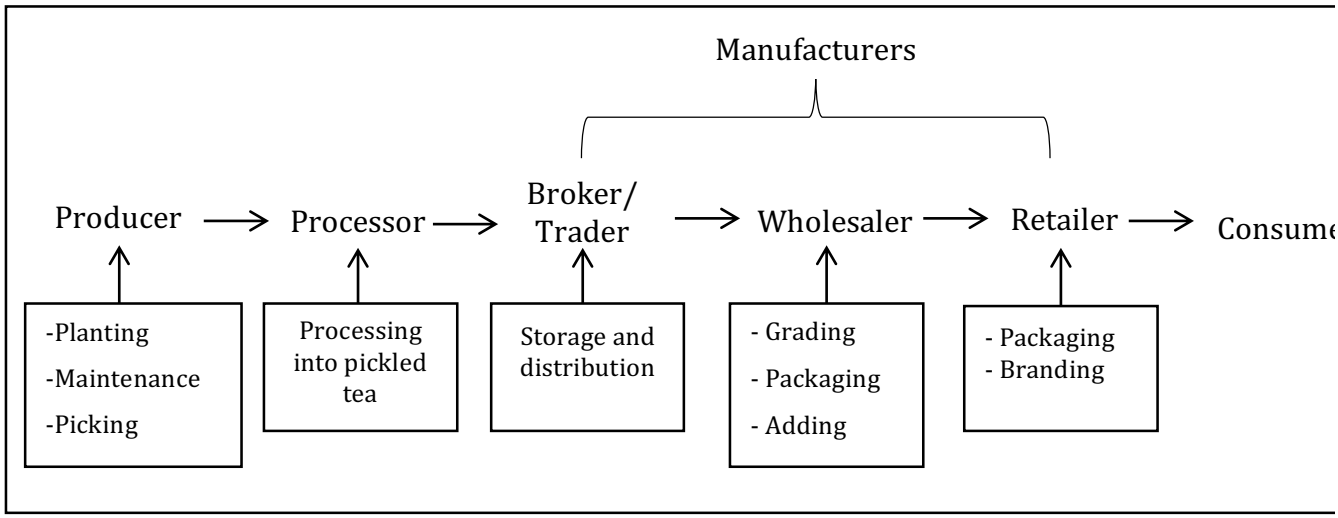


Figure 13: A typical pickled tea value chain.

Note: There is another informal extension in which consumers may be local but export to other countries by means of unregistered ways such as personal export or private

4.2.1 Tea Picking

In Myanmar, the tea plants are named according to the picking or harvesting time. Tea picking season starts from the middle of March and continues until the end of November. The best quality tea leaves are picked from the middle of March to early April and are called *Shwe Phyi Oo* (meaning "very first harvest"), while tea leaves picked in late April are called *Shwe Phi Moe Lut* (meaning "early harvest just before the rainy season begins"). These types are considered the highest quality tea leaves as they are picked during the summer months just before the rainy season, so they do not have any handling or storage problems. Tea leaves picked during the rainy season require greater care in handling and storage to prevent rotting due to mould. *Table 8* shows the types of tea leaves categorised according to the picking season and frequency they are normally picked.

Table 8: **Tea Picking Seasons in Myanmar**

Tea picking seasons	Dates	Picking frequency
Shwe Phi		
Shwe Phi Oo	15 Mar – 15 April	2
Shwe Phi Moe lut/ Shwe Phi lar	16 April – 15 May	2
Kar Kant		
Kar Kant Oo	16 May – 15 June	3
Kar Kant Lar	16 June – 31 Aug	2
Hnin Tat	1 Sept – 15 Nov	2

Tea leaf picking in Myanmar is done manually by hand picking with hired labour (see *Figure 14*). It can be done individually or by picking groups, which are groups of 8 to 15 people with a ratio of 7:3 women to men. Picking requires skill and experience as the tea fields in Myanmar are cultivated along mountain slopes. During *Shwe Phi Oo*, labour shortages become a major problem for most tea farmers. In previous years, labourers from other parts of the country came during seasonal months but this has stopped due to the recent ethnic civil unrest in the area. Moreover, as a consequence of war, people within the regions have also migrated to other countries, causing labour shortages in the tea fields, with the consequence that tea leaves are being picked too late in the season, which reduces the quality of the tea leaves and delays the blooming for the following season. Due to the shortage of labour the labour cost for picking increases for tea farmers. Picking rates vary depending on the slope of mountains and height of the plants. The normal rate for tea pickers is between USD$1.02 to $1.42 per kg (including a meal), or the farmer can give half the amount of harvested fresh tea leaves to the picking group. There is also exchange picking between farmers, where farmers

exchange labour between families. This method is economical for large families. A single person can pluck up to 22-33 kg per day, depending on the location and height of the tea plants. Therefore, for efficient picking and high quality tea leaves, tea plants need to be planted closely, pruned and well looked after (see *Figure 15*).

Figure 14: Tea picking in the Northern Shan State.

Figure 15: Scattered tea plants along the mountain slopes which require filling up and tall tea plants which require pruning for efficient picking of tea leaves.

4.2.2 Producers and Processors

There are two types of pickled tea-producing firms in Myanmar. The first type involves small-scale farmers producing tea alongside other crops. These farmers own the tea fields but picking is done with hired labour. They do not have any formal linkages with other chain participants and sell solely through market-based relationships. Fresh tea leaves can be sold to other farmers, either in the same village or nearby villages, who then process the tea leaves into pickled tea. Depending on quality and supply, the price of fresh leaves varies between $1.02 and $2.84 per kg. This equates to the cost of tea picking and therefore, some farmers mentioned they preferred to leave their tea leaves on the tree rather than hiring labour.

More commonly, however, the tea leaf farmers will process pickled tea themselves at home and then sell the pickled tea to brokers/traders or direct to wholesalers or manufacturers. However, fresh green leaves must be processed into pickled tea on the same day that is picked; so if the farmer intends to sell the fresh tea leaves, it must be done immediately after picking.

The second type of pickled tea-producing firm involves contract farmers who are linked to the standard pickled tea factory, situated in Namsan township. These farmers supply all or a large proportion of their output to the standard factory. The contract farmers must have organic certification for the factory to purchase their tea leaves; however, the factory provides them with stable demand, technical training, and offers ten percent more in price for their product.

The factory in Namsan township was established by the Myanmar Tea Association together with the Palaung Tea Association in February 2013. It has about 12 staff in the pickled tea processing section that are all trained by the Control Union for food safety and quality control. The factory itself has Hazard Analysis Critical Control Point (HACCP) certification and certification from the Control Union; and it only works with farmers who have received organic certification. Inspections are undertaken annually and the products from this factory are focused for export into the United States.

The value chain of pickled tea for the U.S. market has five segments: production of tea leaves, processing into pickled tea, grading and packaging, export, and testing and re-packaging in the United States (see *Figure 16*). Pickled tea is exported by ship and is marketed to supermarket and restaurant chains in the United States.

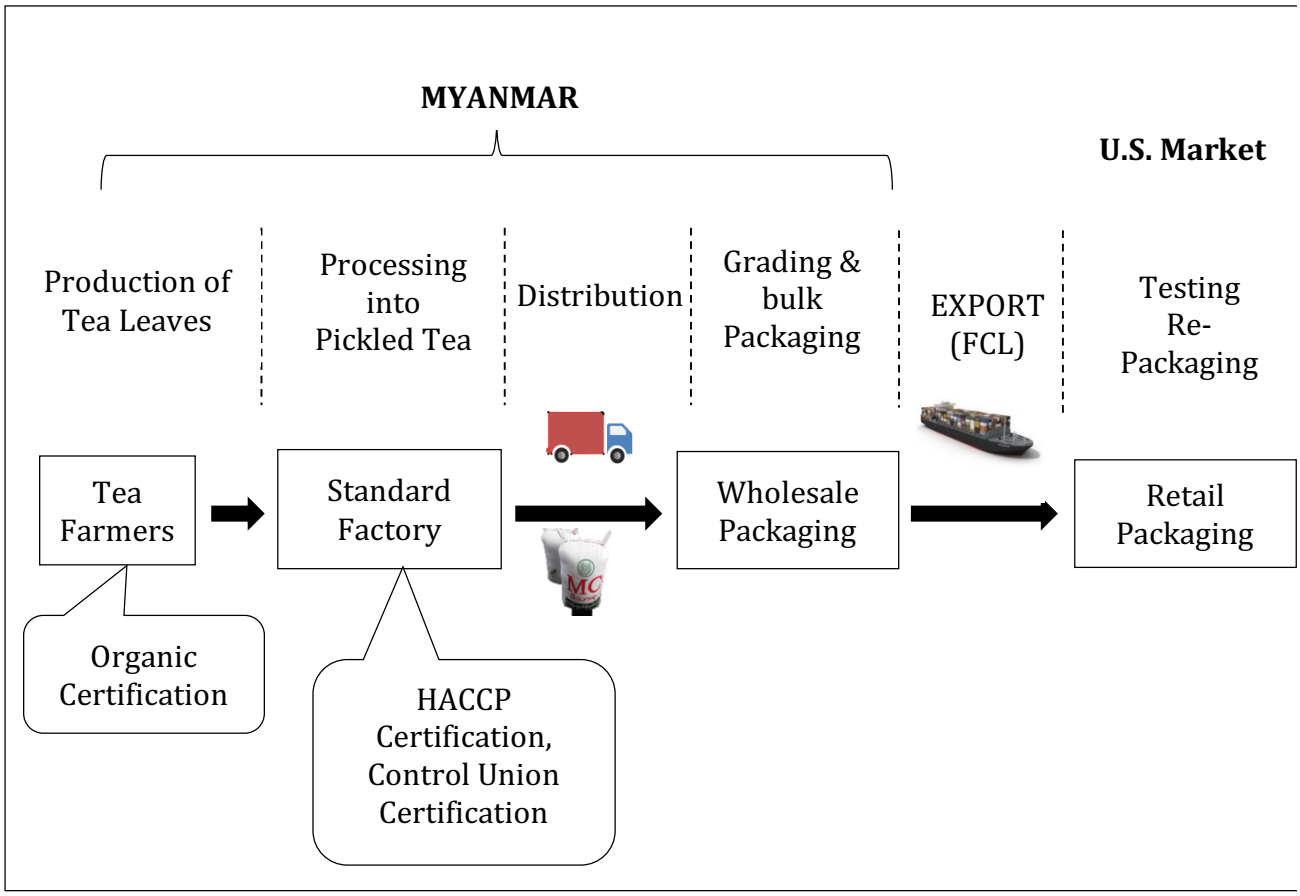


Figure 16: Value chain of pickled tea exported to the U.S. market.

4.2.2.1 Classification of Pickled Tea Producers

The pickled tea sector is comprised of tea growers with different characteristics. The average land holding size of tea farmers is about 2.61 ha, with typical land holdings ranging from 0.81 ha to 6.88 ha. The farmers from northern Shan State possess more land for tea cultivation than farmers from southern Shan State. However, the farmers from southern Shan State are usually engaged in diversification of crops, such as pulses (groundnut, peanut), wheat, maize, and mango, while the farmers in northern Shan State specialise in tea production.

About 93% of farmers from northern Shan State are members of the Palaung Tea Association, while only 13% of the farmers in the southern Shan State engage with the local tea association. One main reason is because the Pindaya Tea Association, an association based in the southern Shan State, has only recently been organised. The main benefits for members of the Palaung Tea Association is that farmers are given training on proper cultivation techniques, including cutting, pruning, and cultivating tea plants along the contour lines.

Most Pindaya households are headed by a male, with 20% of households being female-led. This reveals that women are becoming increasingly involved in tea farming. The age distribution of tea farmers shows that most are economically active, with most aged between 27 and 55 years. With respect to educational status, about 87% of tea farmers have completed primary and secondary education. This implies that most tea farmers are able to read and write. However, about 13% of farmers have never been through formal education, and instead were educated in a monastery.

The major source of income for households in Shan State is crop sales. About 95% of households generate their income from crop sales, of which 90% is from pickled tea, followed by sales of other crops and other small business operations.

4.2.2.2 Pickled Tea Processing

The value addition of pickled tea begins in the processing stage. Pickled tea processing requires a step-by-step value addition, as shown in *Figure 17.*

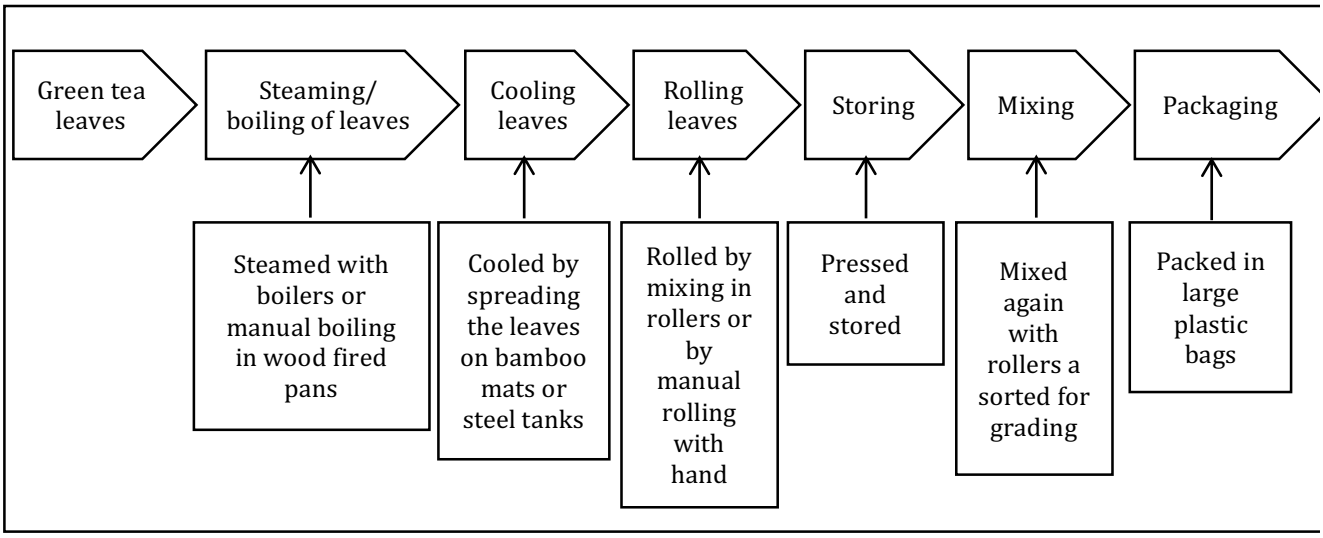


Figure 17: Step-by-step processing of green tea leaves into pickled tea.

The processing of pickled tea differs slightly depending on the location (see *Figure 18*). In southern Shan State, the fresh tea leaves are boiled in hot water for about five minutes before being pressed and spread for cooling. Over-boiling of the tea leaves can cause damage to the leaves, resulting in low quality pickled tea.

Conversely, in northern Shan State, the fresh tea leaves are withered first to remove moisture from the leaves. The withered leaves are withered either by spreading on bamboo mats or placed in steel tanks with fans blowing into the

tanks. The tea leaves are then transferred into boilers for steaming. The steaming process takes three to five minutes depending on the quality (colour) of the leaves. As with over-boiling, over-steaming can also result in damaged leaves. The steamed tea leaves are also allowed to cool down in steel tanks or bamboo racks for about two to three minutes.

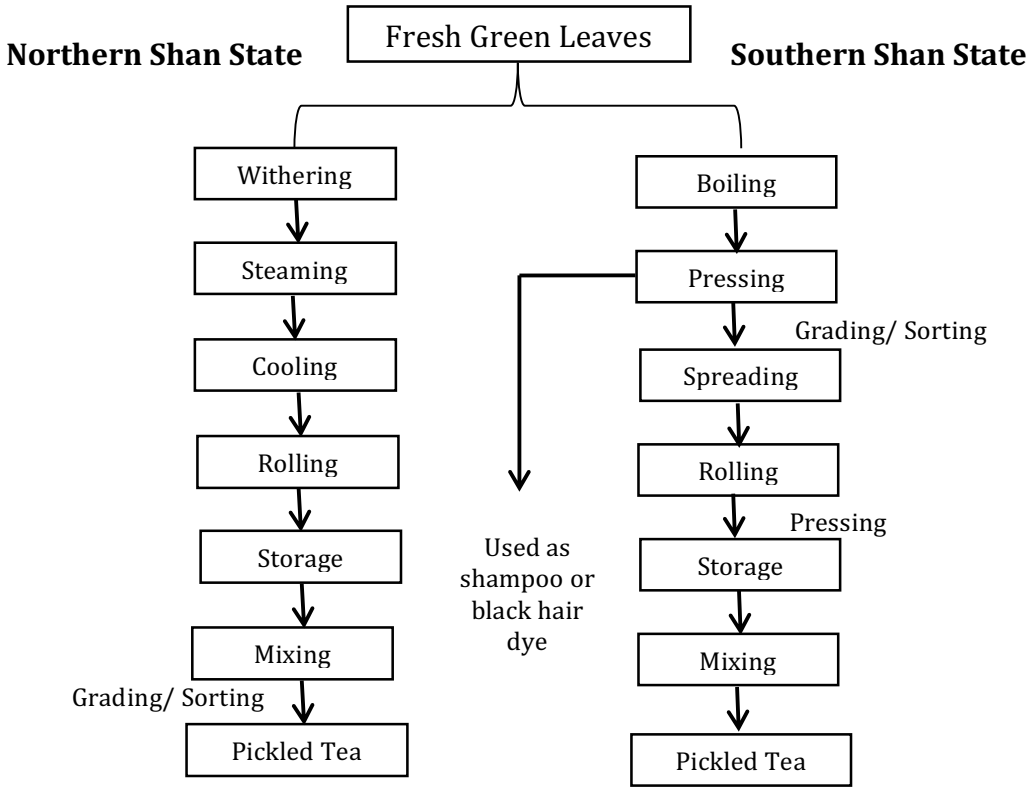


Figure 18: Comparison of pickled tea processing

Once the tea leaves have cooled, the process is continued by mixing the leaves with a roller. The traditional way of rolling is by hand, which requires a lot of time and effort; nowadays, a roller is typically used. The tea leaves are normally rolled 20 to 25 times.

After the tea leaves are rolled, they are pressed and stored for at least 20 days, but sometimes for many years, to allow the natural anaerobic fermentation process to occur. The tea leaf extracts that are produced from pressing the tea leaves are used as black hair dye, shampoo, or as a hair coating. These extracts are believed to have a positive effect on hair growth, but further research is recommended to substantiate this claim.

After the tea leaves have been fermented and stored under pressure for a minimum of 20 days, the leaves become pickled tea. The pickled tea leaves are then mixed again with rollers and are sorted for grading. After the pickled tea leaves are graded, they are then packaged into large plastic bags and are ready for distribution (see *Figure 19*).

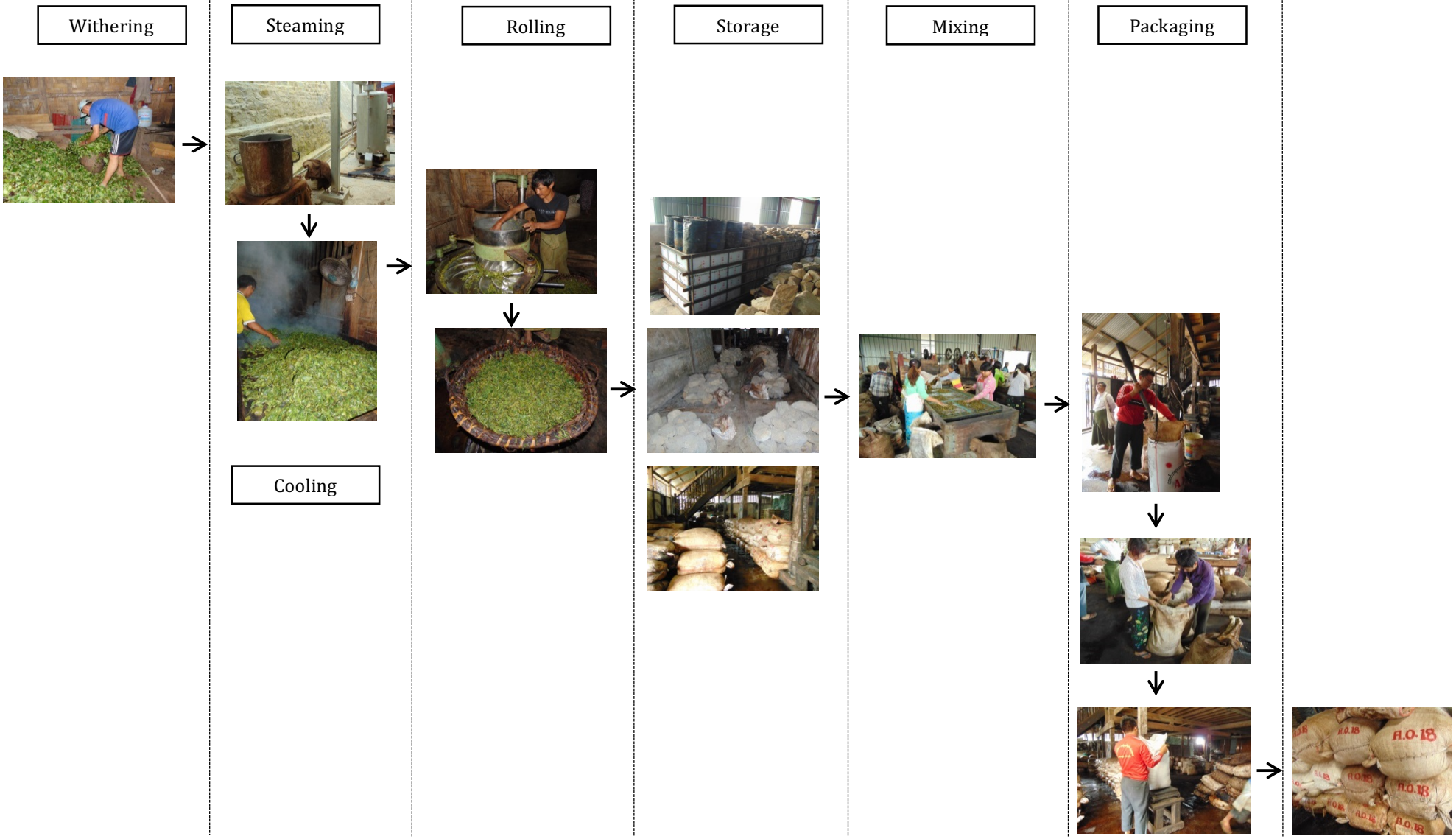


Figure 19: Step-by-step processing of green tea leaves into pickled tea

One of the biggest challenges to processing is food safety and sanitation standards, especially if the pickled tea is to be exported. During 2008-2009, pickled tea was banned in Singapore due to the presence of *Auramine O. Auramine O* is a colour dye restricted for use in food products because it has been found to inhibit growth and liver and kidney function (Bhat & Mathur, 1998). This issue has its roots at the wholesaler stage where traders or wholesalers intentionally or unintentionally make use of *Auramine O* to make the tea leaves look fresh and consistent. Domestically, firms are regulated by rules issued by Food Safety Activities (FSA) of Myanmar and must follow Good Hygienic Practice (GHP) and strict quality control. In 2009, a total of 458 samples of pickled tea in the local wholesale markets in Yangon and Mandalay were tested, with the results showing that 253 samples (55.24%) were found to contain *Auramine O*. The results were highly publicised in newspapers and contaminated products were destroyed by township food and drug supervisory committees. Health education was given to the public through media and workshops and seminars were given to pickled tea manufacturers. In September of the same year, a total of 667 samples were tested again and all the tested samples showed a negative result for *Auramine O.*

4.2.2.3 Storage

Tea leaves are stored in various ways (see *Figure 20*).

1. The rolled tea leaves are placed into large plastic bags and are stacked on top of the other. Bags should be stacked no more than four high, as too much pressure on the bags can result in a lower weight as the water will be drained from the

tea leaves. This method of storing affects appearance because the black liquid (tannins) from the pickled tea stains the bags, making the bags look dirty. This does not affect the quality of the pickled tea leaves inside or the visual appeal to the wholesaler or manufacturer as they repackage the product.

2. The rolled tea leaves are buried inside pits dug in the soil—this is the traditional manner of storing tea leaves.
3. It can also be stored in steel or wooden tanks. This method is widely used in the region.

With the latter two methods, two or three layers of plastic bags are used to line the sides of the pit or tank. In the bottom, some people use a layer of bamboo racks, followed by a layer of ferns, banana leaves, or plastic sheets. Ferns can be a hazard when taking the tea leaves out as it can hurt or scratch hands. The rolled tea leaves are then placed inside the pit or tank and are covered by a layer of plastic cover or a wooden rack. Rocks are placed on top of it to add pressure. Alternatively, tanks filled with water can be used; however, this has its disadvantages, such as when new rolled leaves are added to a part-filled tank, the water needs to be drained and refilled.

Pickled tea is stored anywhere from 20 days to many years, depending on the demand in the market. Storing the pickled tea for longer reduces the bitterness of the taste; however, one of the major constraints when it comes to storage is adequate space.

Figure 20: Storage of pickled tea: in plastic bags; in pits; and in steel tanks.

4.2.2.4 Distribution

Production of pickled tea takes place in geographically dispersed locations, which has implications on availability and accessibility of pickled tea in Myanmar. Shan State and Chin State together account for 90% of the total tea production in Myanmar, with Shan State—the major location for pickled tea production—accounting for about 80%. Shan State is a mountainous region with high altitudes, deep slopes, excellent soil conditions, and an ideal climate for tea plantations.

After harvest, the fresh tea leaves are transported from the tea fields to farmers' houses or pickled tea processors. Transportation is mainly by foot, bullock carts, horses, or motorcycles; rarely, tea leaves are transported by car. Undeveloped roads and infrastructure results in losses in both quantity and quality of tea leaves, due to loss of product in transit or the carrier not being able to deliver the product to the processor within the required one-day period.

After the tea leaves are processed, large amounts of pickled tea from both Shan and Chin States are sold to wholesalers or manufacturing companies located in

large cities, such as Mandalay and Yangon. The pickled tea is then packaged into smaller parcels and distributed to retail outlets throughout the country. Transportation to retail outlets is by trucks or buses.

The transportation cost of pickled tea is high and it is normally covered by the seller. Transportation for one bag (80-100 kg) of pickled tea ranges from $1 - $5 depending on the location and means of transport. When a pickled tea seller is profiting $1.02/kg for low quality pickled tea, if he has to pay $0.5/ kg for transport (considering $5/bag) that will mean transportation costs 50% of his profit which is considerably high. In terms of high quality pickled tea the profit is $2.46/kg so the transportation costs 20%; however, it is still high. *Figure 21* shows the geographical dispersion of domestic pickled tea production in Myanmar.

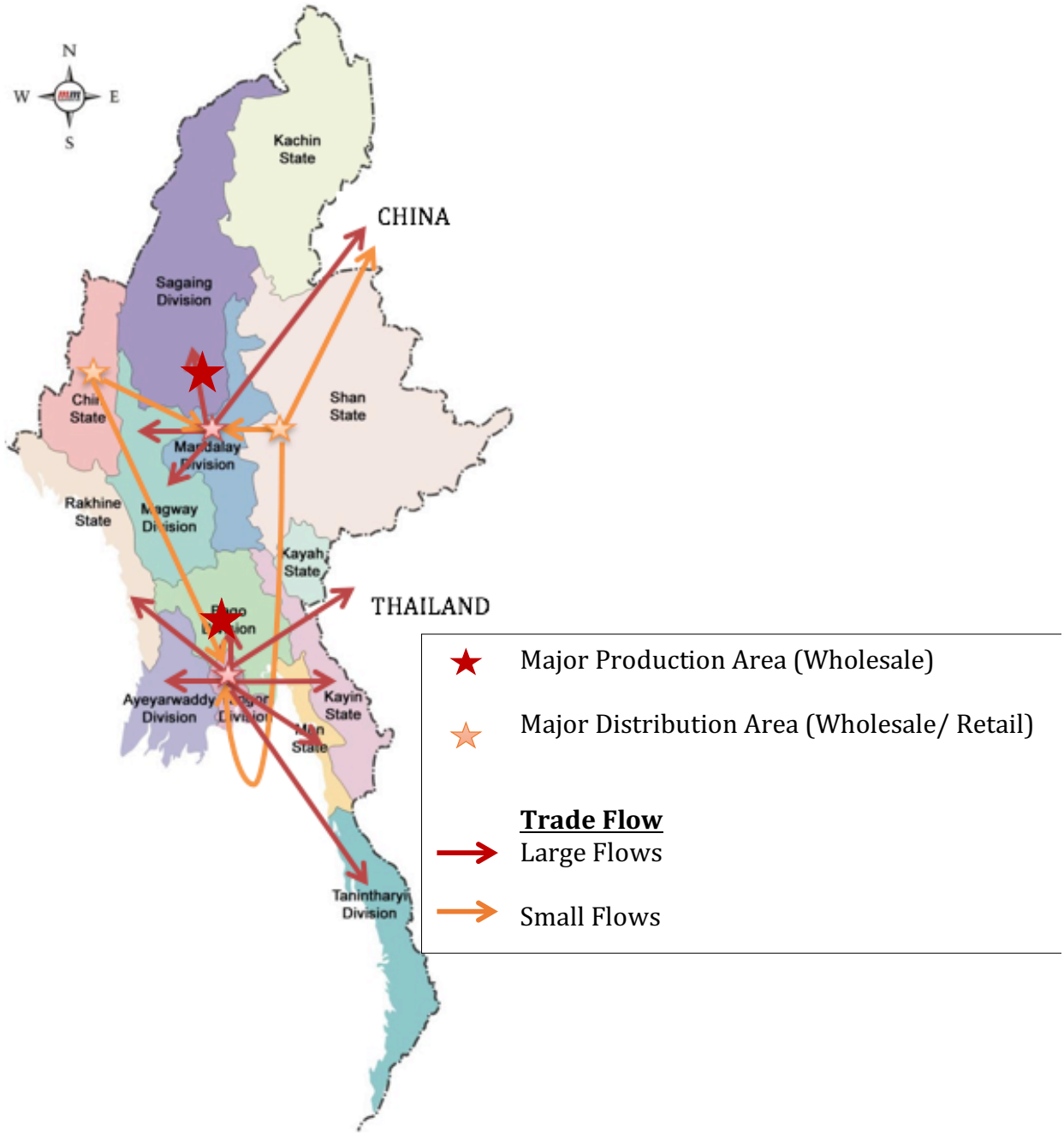


Figure 21: Production and market flow map of pickled tea.

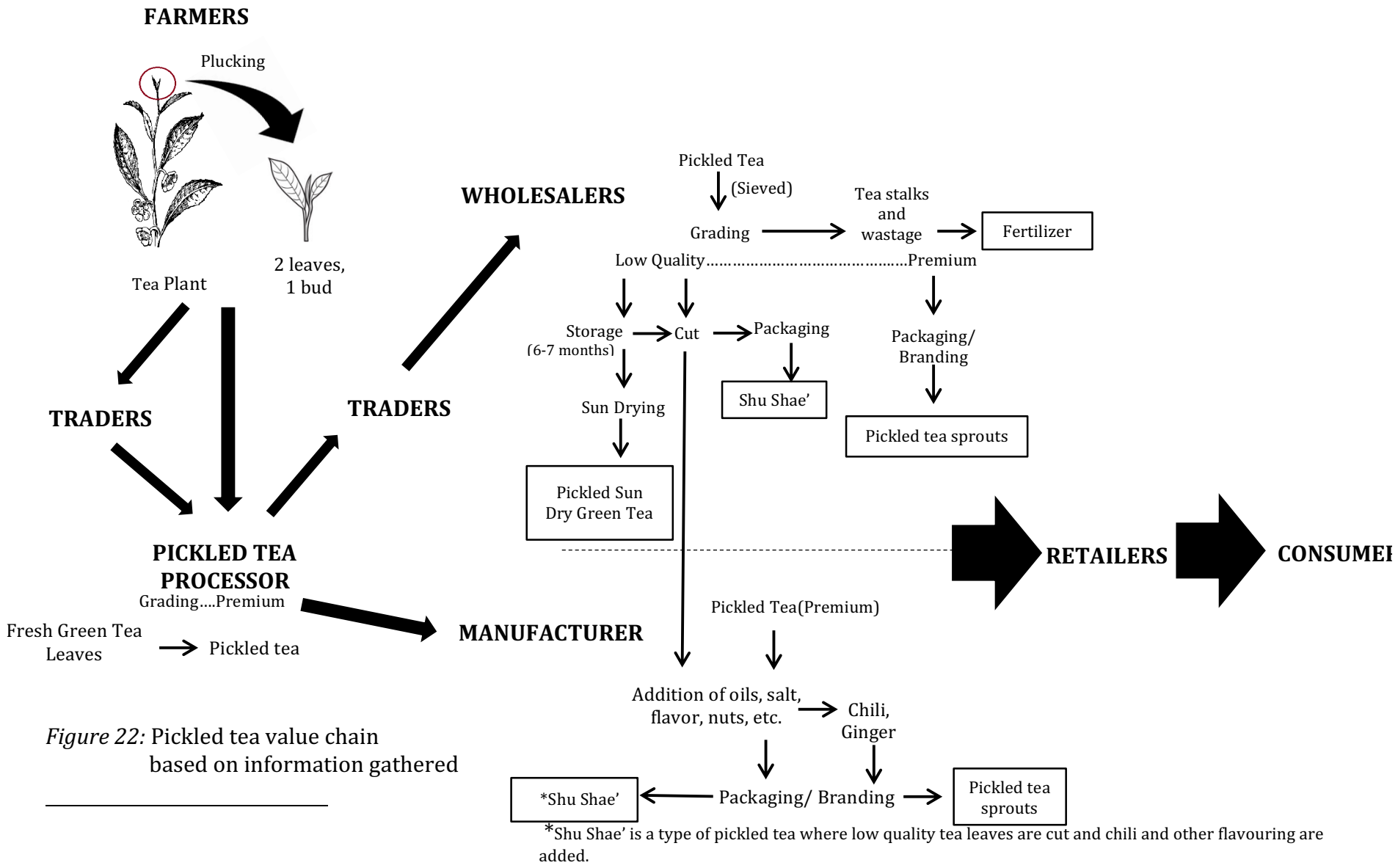
4.2.3 Traders

Traders act as a bridge to connect the tea farmers to pickled tea processors or, where the farmer is also the processor, they connect them to wholesalers. They buy large amounts of pickled tea from different pickled tea farmers and sell the product to wholesalers in the big cities.

They also control and fix prices, therefore creating price symmetry and making extra profit from the process. This allows the traders to control the price to both farmers and wholesalers.

4.2.4 Wholesalers

The second stage of value addition takes place at the wholesalers, where the pickled teas are graded by sieving (see *Figure 22*).



*Shu Shae' is a type of pickled tea where low quality tea leaves are cut and chili and other flavouring are added.

Figure 22: Pickled tea value chain based on information gathered

Depending on the quality of the tea leaves, five groups of pickled tea grades can be identified: premium quality, top quality, medium quality, top medium quality, and low quality. The tea farmers who produce pickled tea can also act as wholesaler.

Some of the attributes used to grade the pickled tea are based on the maturity of leaves, appearance of buds and top two leaves, size of leaves, and region of origin. Pickled tea leaves which come from the village of Zayan, located near Namsan township, have the highest prices, followed by the village of Pindaya. These pickled teas have higher prices due to the fact that these regions are well-known for growing the highest quality pickled tea in the country because of the environment in which the tea plant is grown. Low quality pickled tea leaves from Zayan have a similar price compared to pickled tea leaves from other regions such as Moe Gote, Pin Lone and Kyout Me in other states. Prices can vary from USD$3.05 to $8.13 per kg, depending on quality (see *Figure 23*).

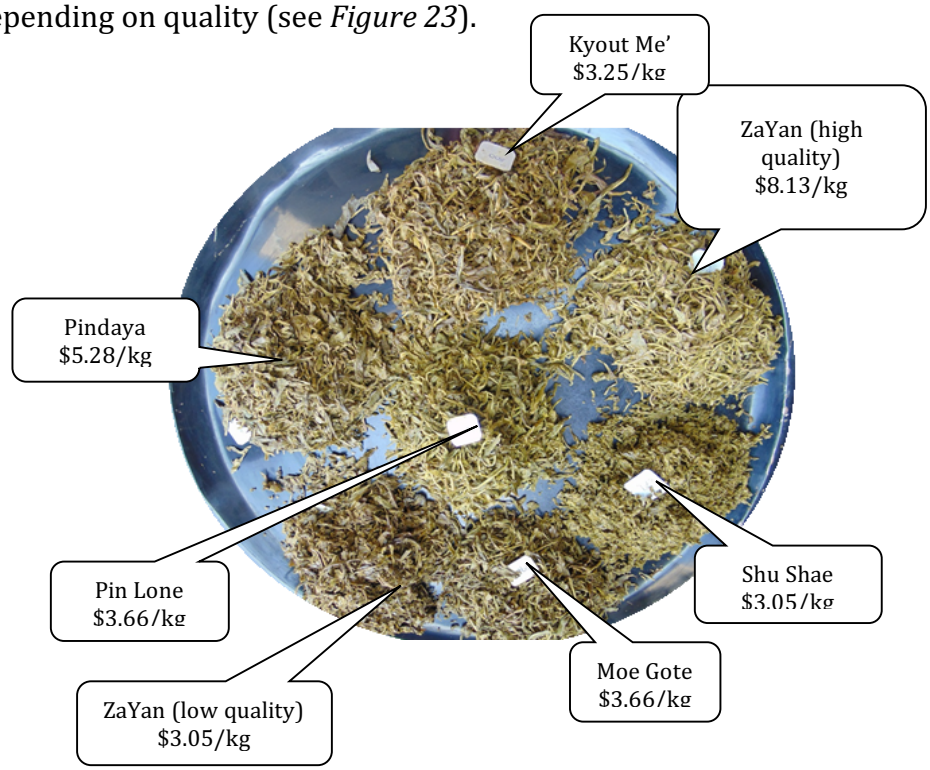


Figure 23: Pickled tea prices (prices as of July, 2015).

Premium quality pickled teas are sold to retailers as pickled tea sprouts either with or without brand names. Low quality tea leaves, which remain on the top of the sieve when grading, are ground into smaller pieces. These can be used to produce a particular type of pickled tea called *Shu Shae*, which is made by adding chili, flavouring, ginger and oil; otherwise, the ground small pieces of low quality tea leaves are sold to manufacturers who add value to the product and sell under a particular brand.

Another way to use the low quality pickled tea leaves is to make pickled sun-dried green tea. This is made by re-storing the low quality pickled tea leaves left on top of the first sieve back into bags, tanks, or pits with pressure on top. The pickled tea leaves are left under storage to ferment for about six to seven months. The leaves are then sun dried and ready for drinking. Farmers or wholesalers normally practise this method when the pickled tea market price reduces. This type of tea is popular in the *Ayeyarwardy d*istrict.

The wholesale market mainly sells to the domestic market. The domestic market for pickled tea mainly goes through two local channels: the wet market, which is an open marketplace where various food products are sold, or small retailers.

4.2.5 Manufacturers

Manufacturers buy premium quality pickled tea directly from the farmers. Value is added by the addition of other ingredients, including oils, salt, flavour, nuts, and beans, to the pickled tea (see *Figure 21*). The manufacturers also produce *Shu Shae*

when they get a supply of chopped low quality leaves from the wholesalers. The pickled tea is then packaged into packets with various designs with their own brand name. The manufacturers have their own distribution channels based in big cities, which are mainly through the supermarket chains. They also supply to wholesalers and retailers in the domestic market with their specific brand name.

The export market for pickled tea has yet to be developed; however, a US-based importer recently began taking full container loads of bulk pickled tea for repackaging. Because this business is in its infancy, it is too early to consider it an established supply chain and this could be an area for future research.

4.2.6 Retailers

Retailers are one of the main participants in the pickled tea value chain because they are the last link between producers and consumers. The involvement of retailers in the value chain includes buying pickled tea, transporting it to retail shops, repackaging, displaying, and selling to consumers. The domestic market for pickled tea mainly goes through restaurants, traditional retailer shops and supermarkets. Traditional retail shops buy pickled tea from wholesalers and repack into smaller quantity while supermarkets get the supply of pickled tea from manufacturers. Supermarkets are gradually replacing purchases of pickled tea from small retailers because of the transparent price as well as safety of products and the convenience for consumers living in urban areas. However, in the rural areas small retail shops still occupy the market for pickled tea.

4.2.7 Consumers

The downstream pickled tea chain ends with the consumption of pickled tea by the consumers, mostly in the domestic market. However, the export of pickled tea to the global market would add another step to the downstream supply chain, but is yet to be developed in Myanmar.

It has been reported that very little information regarding with preference with the different tastes in pickled tea from consumers has been reported back to the wholesalers, manufactures, and to the pickled tea producers. The preference of pickled tea by Burmese has mainly been influenced by historical factors and other agents over a period of time.

4.2.8 Other Participants and Organisations

4.2.8.1 Input Suppliers and Finance

Inputs (fertilisers and herbicides) can be procured and supplied to the growers on credit terms by factories (Hlaing, 2008); however, this research found no usage of fertiliser in tea cultivation in the study areas. The primary reason for this was because farmers cannot afford to utilise fertilisers and pesticides. Therefore, Myanmar tea can be regarded organic tea or close to it. Chen (2007) stated that organic food these days are known to be free from contamination carrying additional risk of food poisoning, and contain more nutrients than conventional foods Consumers also consider organic food to be healthier and are willing to pay higher value for it (Grankvist & Biel, 2001).

Tea plantation loans are provided by the Myanmar Agricultural Development Bank (MADB). It is the major source of institutional credit for small farmers, and is owned and supervised by the Ministry of Agriculture and Irrigation. MADB finances loans depending on the performance of the plantation, with a grace period of three years, after which the farmer pays three instalments over the next three years. Tea processing and production loans are also given by MADB to farmers who have successfully cultivated tea and require working capital to process their tea products (Win, 2013).

4.2.8.2 Supporting Organisations

Tea cultivation in Myanmar is supported by various organisations. These organisations are important to the tea value chain because they give financial and technical support to the tea farmers in Myanmar. These organisations include the United Nations Office on Drugs and Crime (UNODC), International Rescue Committee (IRC), Japanese International Cooperation Agency (JICA) and Swiss Agency for Development and Cooperation (SADC).

According to the UNODC, Myanmar is the second largest producer (after Afghanistan) of opium in the world, with 90% of opium poppies grown in Shan State. Therefore, global, national, and local-level support has been given to phase out opium production; tea cultivation has been promoted as a substitute crop as it grows well in Shan State (Dawson & Barlow, 2006). The necessary support has been provided by various organisations by distributing tea seedlings, introducing modern cultivation techniques for tea, and providing tea cultivation

demonstrations, as well as delivering sustainable livelihood improvements to poor tea-producing smallholders in northern Myanmar by developing sustainable linkages between smallholder farmer groups and processors, and between processors and higher-value domestic, regional, and international markets.

On a national scale, the government of Myanmar has developed a thirty-year long-term tea production development programme, and has assured market access for alternative crops (i.e. tea), as well as freedom of movement and transit for farmers to transport and sell their crop at market. The Ministry of Agriculture distributed tea seeds worth K 123.762 million (USD$121,335) free of charge from 2000 to 2011 (Myanmar Agriculture Service, 2012), and collaborated with Sri Lanka to introduce modern tea varieties, upgrade research and development programmes, improve resources and investment, and establish research stations and technical cooperation. The plant protection division under the Department of Agriculture (DOA) is also taking a major role in pest and disease management by giving information on shifting from chemical-based production to integrated pest management controls designed to eliminate toxic chemicals, as well as inspecting and regularly monitoring tea fields. On a local scale, the Palaung Tea Producing Association (PTPA) was established on 22 May 2013 at Mumton township in eastern Shan State, with the objective of developing tea plantations and tea production. Despite the support from both international and national organisations, the opium problem still exists and tea production remains low in Myanmar.

Tea farmers in the study area reported that there is no direct support from the Government, so it is unclear if there are no support mechanisms provided by the government or if the farmers are not informed of existing programmes.

In 2009, the Myanmar Fruits and Vegetable Producers Association (MFVPA) created a private sector association named the Myanmar Organic Agriculture Group (MOAG) to support the development of organic agriculture in the country. MOAG contains about 100 members (December 2011), most of which are individuals, with only four private companies. MOAG provides organic certification services and technical advice to interested producers. The private sector has developed national organic standards and certification services were initiated in late 2010. However, the government of Myanmar has no policies and regulations on organic agriculture yet.

4.3 Margins and Benefit Shares of Participants

Pickled tea passes through a number of channels before reaching the end consumer (see *Figure 24*). This implies that there are possible operational losses, including transport, labour, packaging, storage, and other transaction costs, which result in a higher food cost to the consumer. This is because of the geographical dispersion of the markets and the absence or limited availability of adequate appropriate institutions to shorten the value chain.

From the price point of view, the tea farmers and pickled tea producers are getting prices based on the quality of the tea leaves and the quality of pickled tea. After the pickled tea reaches the producer stage, it goes through two channels either to the wholesalers or to the manufacturers. Both the high and low quality pickled teas are sold to the wholesalers while only the high quality pickled teas are bought from manufacturers. The difference in pickled tea prices between wholesaler and manufacturer is mainly due to the value addition to the product. The manufacturers add value by adding other ingredients, including oils, salt, flavour, nuts, and beans, to the pickled tea, as well as packaging, branding, certification in order to sell it at a higher price. On the other hand, the wholesaler only grades the pickled tea to low and high quality products and sells it to the retailers.

The pickled tea products from the manufacturers and wholesalers go to two separate retailers. The products from manufacturers are sent to supermarkets and focus on high level income consumers and export while the pickled tea from wholesalers are sold to domestic retail shops or markets focusing for domestic consumption.

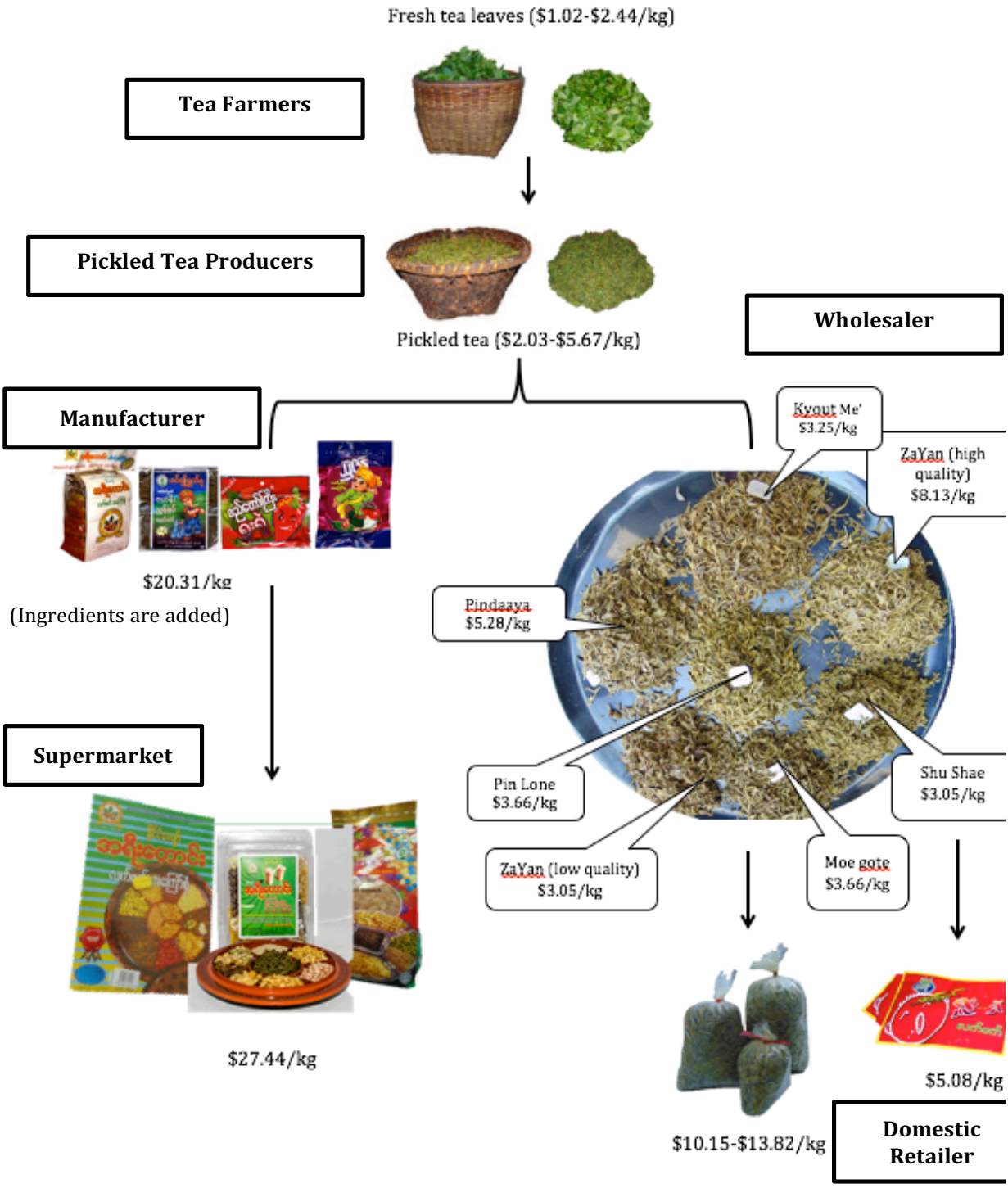


Figure 24: Prices of pickled tea sold at different stages in the value chain

The prices received by the main pickled tea producers is less compared to other traders in the value chain due to lack of control over the market and the low

bargaining power of farmers, caused by lack of information about the market price and the power of brokers. *Table 9* shows the average prices received of pickled tea by each respondent group of the value chain and the price margins for pickled tea made with both low quality leaves and good high quality leaves. The average margin that each participant receives in each channel depends on the buying price, selling price, and the cost involved. It can be seen that the price increases considerably as the pickled tea product moves from different participants up the value chain, with the manufacturers receiving the highest price margin due to the value addition to the high quality pickled tea products.

Table 9: **Pickled Tea Average Prices for Value Chain by Respondent Groups**

	Low quality leaves		**High quality leaves**	
Respondent Groups	Price received ($/kg)	**Price Margin**	Price received ($/kg)	**Price Margin**
Farmer	$1.02	$1.01	$2.44	$3.23
Producer	$2.03		$5.67	
Wholesaler	$3.05	$1.02	$8.13	$2.46
Domestic Retailer	$5.07	$2.02	$13.82	$5.69

	High quality leaves	
Respondent Groups	Price received ($/kg)	**Price Margin**
Farmer	$2.44	$3.23
Producer	$5.67	
Manufacturer	$20.31	$14.64
Supremarkets	$27.44	$7.13

The manufacturers make the highest margin of $14.64 per kg (72% price margin) as they purchase good high quality pickled tea direct from the producers at $5.67 per kg then re-brand, package and sell at $20.31. The higher price margins indicate that high quality tea leaf production is an efficient and stable business. This suggests that product quality and value addition is a key factor in the value chain.

For example, for the high quality pickled tea products, the wholesaler buys the pickled tea at $5.67 per kg and sells at $8.13 per kg, receiving a margin of $2.46 per kg; while the manufacturers who buy direct from the producer at the same price of $5.67 per kg and sell at the higher price of $20.31 per kg make a higher margin of $14.64 per kg. All participants in the value chain make some margin; however, the manufacturers benefit more depending on how much value they add to the product. In order to make a higher margin, there is a need to concentrate on the quality of the pickled tea along with reducing unnecessary costs which lead to increased costs in the value chain. Figure 25 shows the differences in prices of low and high quality pickled tea received at each level of the value chain.

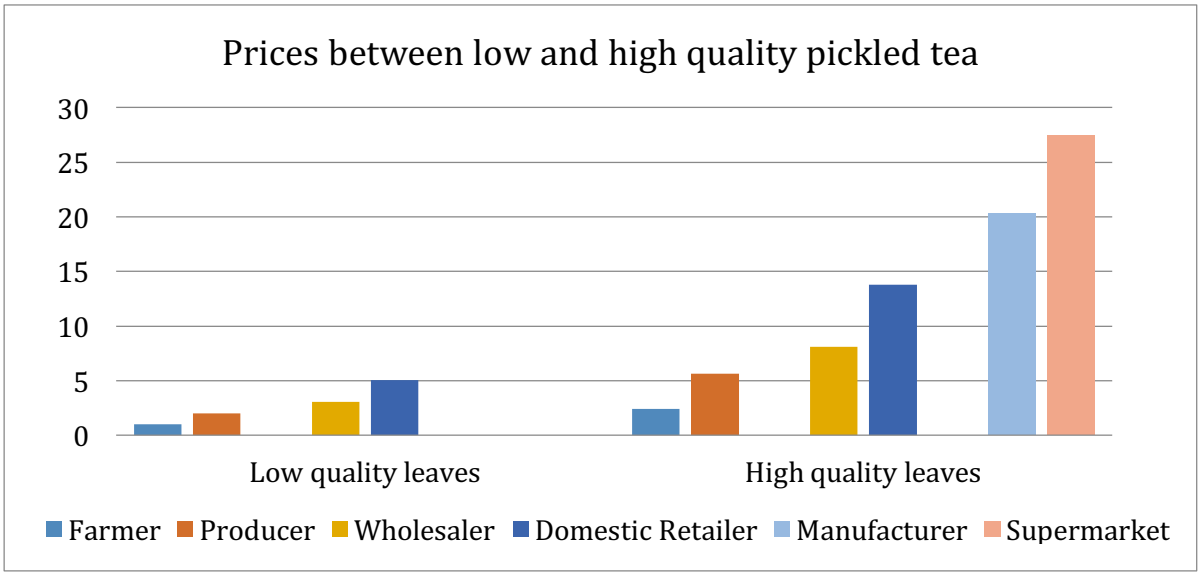


Figure 25: Difference in the prices of poor and high quality pickled tea received at each level of the value chain by the participants.

Moreover, the high quality pickled tea sold in the local market for $27.44 per kg is sold at the price of $17.55 for 8 ounce on Amazon; so the pickled tea is sold for $77.38 per kg (not including shipping). This indicates that $50 margin per kg will be gained when pickled tea is exported through Amazon. This sale margin of $50/kg across the supply chain represents hundreds of percent margin in certain levels so it is the building of value. If a manufacturer were to export 1000 kg per week, they could potentially receive US$50,000 profit per week (US$200,000 per month).

Figure 26 shows the increase in prices of pickled tea sold at each level of the value chain. Market prices help to identify the cost and profit of different participants in different points in the value chain, and also aid in identifying strategies which could be implemented to improve the pickled tea market. The trend of increasing the total cost of the final pickled tea product shows that as the quality increase and more value is added to the product the more margins are gained and in order to increase the farmer's share for fresh green tea leaves the quality should be maintained.

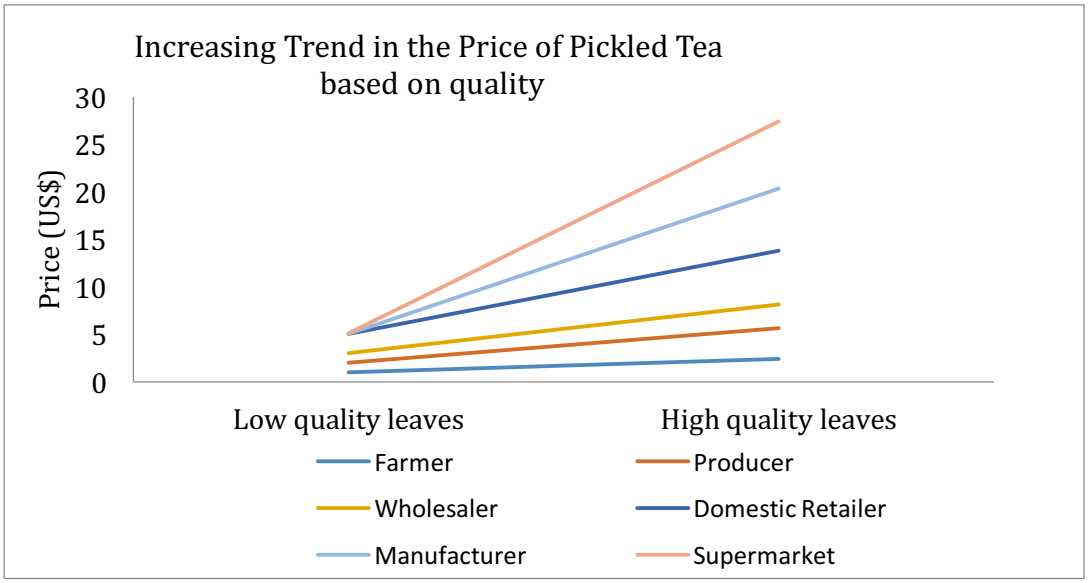


Figure 26: Increase in prices of pickled tea sold at each level of the value chain

4.4 Potential of Pickled tea in the International Market

A total of 30 Myanmar restaurants located in New Zealand, Australia, Thailand, Singapore, and the United States were interviewed for this study. *Table 10* shows the number of restaurants surveyed for each country.

Table 10: **Number of Restaurants Surveyed by Country**

	New Zealand	Australia	United States	Singapore	Thailand	Total
Number of restaurants surveyed	1	7	10	5	7	30

It was observed that all the Myanmar restaurants surveyed have pickled tea on their menu, either as a side dish or a main meal to be eaten along with rice. This supports the assertion that pickled tea is a unique ethnic food of Myanmar which represents the traditional Burmese culture. Pickled tea in restaurants is served as a salad mixed with nuts, lettuces and tomato (see *Figure 27*).

Figure 27: A typical dish of pickled tea served as a salad.

One restaurant in San Francisco served pickled tea salad with nuts and other ingredients separately on a plate; the server identifies each component then mixes the dish in front of the customer (see *Figure 28*).

Figure 28: Pickled tea leaf salad before being mixed

(Burma Superstar Tea Leaf Salad)

Another restaurant in Perth sells pickled tea to take away in containers with small compartments for pickled tea, peanuts, fried garlic, and sesame, designed to be mixed and eaten by the customer. About 95% of the restaurants stated that pickled tea salad is a very popular dish among customers.

Major customers vary depending on the country. In New Zealand, the major customers are from Asia (both East and West Asia). In Australia, the major customers are mostly Australians (45%) with a few East Asians (33%) and Burmese (22%). A wide range of pickled tea customers exist in the US with 50% Americans, 22% other ethnicities (tourists including Caucasians), 17% West Asians, and 11% East Asians. Singaporeans are the major customers for pickled tea in Singapore with a few tourists and East Asian customers. Burmese customers are

very few in both Singapore and Thailand as pickled tea can easily be bought in small retail shops. In Thailand, the major customers for pickled tea are tourists who want to try the taste of Burmese food.

With regards to sales, seven restaurants stated that that pickled tea sales have increased; six of these restaurants are in Australia. Ten restaurants stated that sales remain stable without any increase or decrease, and the remaining 13 restaurants could not answer the question as they have only been open for less than 6 months. The total number of pickled tea dishes sold is described in *Table 11*, together with the prices for each plate in each country.

Table 11: **Total Number of Pickled Tea Leaf Salad Dishes sold per Restaurant and the Prices sold at Different Countries**

	Number of plates sold per day			*** Price of pickled tea salad**			
	Minimum	**Maximum**	**Average**	**Minimum**	**Maximum**	**Average**	**USD**
NZ	n/a	n/a	10	n/a	n/a	NZ$12.00	$8.11
Australia	5	10	8	AU$7.50	AU$16.90	AU$13.45	$9.67
USA	15	100	43	US$5.00	US$14.00	US$9.61	$9.61
Singapore	10	30	22	SG$5.00	SG$12.50	SG$8.75	$6.26
Thailand	5	10	7	THB30	THB75	THB52.5	$1.50

Note: Based on Exchange rates as of 28th Oct, 2015.

Supply of pickled tea varies for each country and difficulty of access also depends on the importing country. In New Zealand, Australia, and the United States,

restaurants can only get pickled tea through online shops or by travelling to Myanmar. For some restaurants, families living in Myanmar would send pickled tea through DHL or post; however, this way of shipping is very expensive and this can explain the higher prices of the pickled tea dishes in these countries, compared to other countries like Singapore and Thailand where there are small retail chains where the restaurants can easily get the pickled tea from.

Restaurants in New Zealand, Australia, and the United States stated that it is very important for the product to gain certain certifications for hygiene and quality as customers are very aware of food safety; whereas in countries like Thailand and Singapore the importance of certification is slightly lower, yet still important (see *Figure 29*).

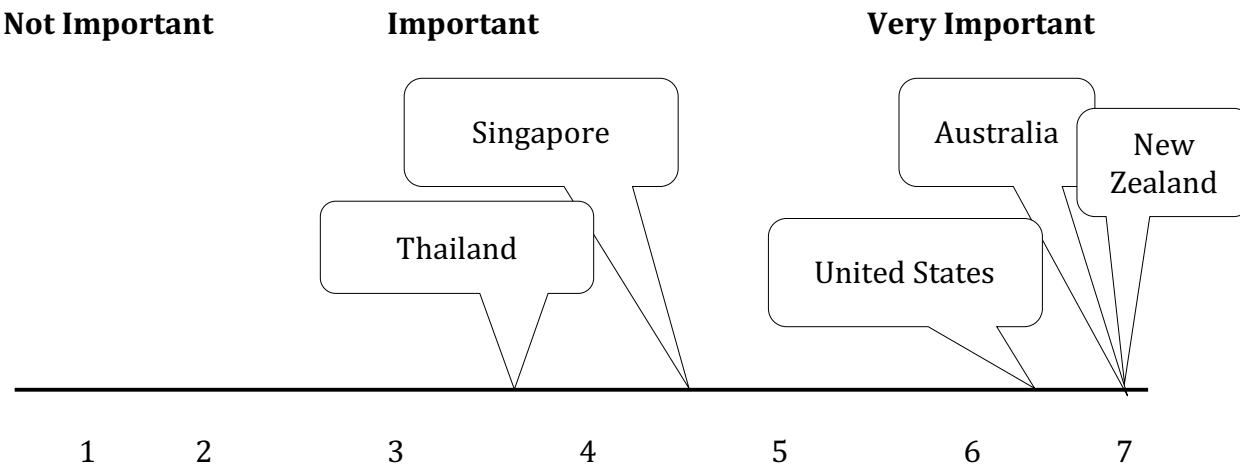


Figure 29: Importance of certification on a Likert scale of 1-7.

4.4 Pickled Tea in the United States Market

According to the United States Census Bureau projections in 2010, the U.S. population has become more diverse, with the Asian population currently estimated to be 4.6%. In 2011 the ethnic food market continued to grow, with $3 billion in sales and 5-6% annual growth; it is expected that sales will reach $3.9 billion in 2016 (Mintel Group, 2012). There has been a dramatic increase in demand for ethnic cuisine, and ethnic restaurants have become more mainstream in the United States (Po, 2007).

Moreover, since the 1970s, U.S. consumers have become more health conscious, especially concerning their intake of fat, sodium, calories, and cholesterol (Choi, 2000). In addition, according to the American Spice Trade Association, a taste for highly spiced food has developed and the consumption of hot spices has increased more than 73% in the last two decades (Tainter & Grenis, 2001). As the demand for ethnic food in the United States increases along with the changes in consumption patterns for healthier food products, there is an opportunity for pickled tea to enter the U.S. market.

“Burma Superstar”, a Burmese restaurant in San Francisco, received Sunset Magazine's 2013 “Best of the West Award” for their famous “Pickled Tea Leaf Salad”. The dish was nominated for the “Big Dish” contest from a number of past stories in the magazine as well as from travel and food writers in various regions. It was also selected as the winner for the salad category with the highest number of votes among the ten nominated dishes (C. Ryan, Senior Editor of Sunset Magazine, personal communication, April 22, 2015).

Not many people in the United States, however, are familiar with the Burmese tea leaf salad, or even with Myanmar in general, as the country have been closed from the rest of the world by its military regime. People who are interested in Asian food, health food, or food which have been pickled or fermented may be interested in pickled tea. Primarily, because of the current challenges of importing it directly, there are a few tea companies in the United States which would consider carrying such a product if it were to be certified organic under the USDA National Organic Program and made available through a wholesaler in the United States (J. Lopatin, co-founder of Arbor Tea, personal communication, April 15, 2015).

4.5 Constraint to Research—Rationale for not Taste-Testing Myanmar Pickled Tea in New Zealand

Initially three samples of pickled tea were imported from Myanmar for use in a preliminary taste-testing exercise as part of this research. The New Zealand Ministry of Primary Industries required a pH test of the samples for *Clostridium botulinum* as a precursor to the taste testing. My thesis supervisor, Walter Glass, asked that I request Professor John Bronlund and Associate Professor Brian Wilkinson of Massey University; both recognised specialists in food and bioprocess technology, to advice and co-ordinate on this part of the research.

Three different brands of pickled tea were sent from Myanmar to be tested. The pH results showed 4.35, 4.45, and 4.7 for the respective brands.

Because one of the brands had a value of pH 4.7, which is greater than the New Zealand Ministry of Primary Industries' limit of pH 4.6, it would have been illegal to use this product for taste testing under New Zealand law. This product had also been held at room temperature since picking and had not undergone a full thermal process to neutralise *Clostridium botulinum* (Fo=3).

Although the two other brands were within the acceptable range, it was decided that given the cost and work involved, it would be preferential to do a full statistically-robust taste testing, rather than an indicative product acceptance evaluation. A full taste-test also required substantially more time and money, and these resources were limited for this research. Moreover, the pickled tea product has been readily accepted in markets like the USA and Singapore and private

samples have been imported to New Zealand, so market acceptance was able to be proven to some degree.

Professor Wilkinson anticipated that the cost of taste testing would be over NZ$5000 per product, and there would be a requirement to ensure that any Clostridia that were picked up in the packs was not *Clostridium botulinum.* Both Professors Bronlund and Wilkinson have advised not to progress with the taste testing at this point. This taste testing was noted as an area for further research, as this is a unique product with global marketing potential but a paucity of research.

CHAPTER 5

DISCUSSION AND RECOMMENDATION

5.1 Introduction

In this chapter, the constraints and weaknesses are discussed in terms of the entire value chain; and recommendations are given to improve the integrity of the pickled tea value chain and upgrade the chain to benefit chain participants, especially pickled tea farmers.

5.2 Weaknesses in the Value Chain

Various weak links exist in the pickled tea sector of Myanmar, as shown in *Figure 30.*

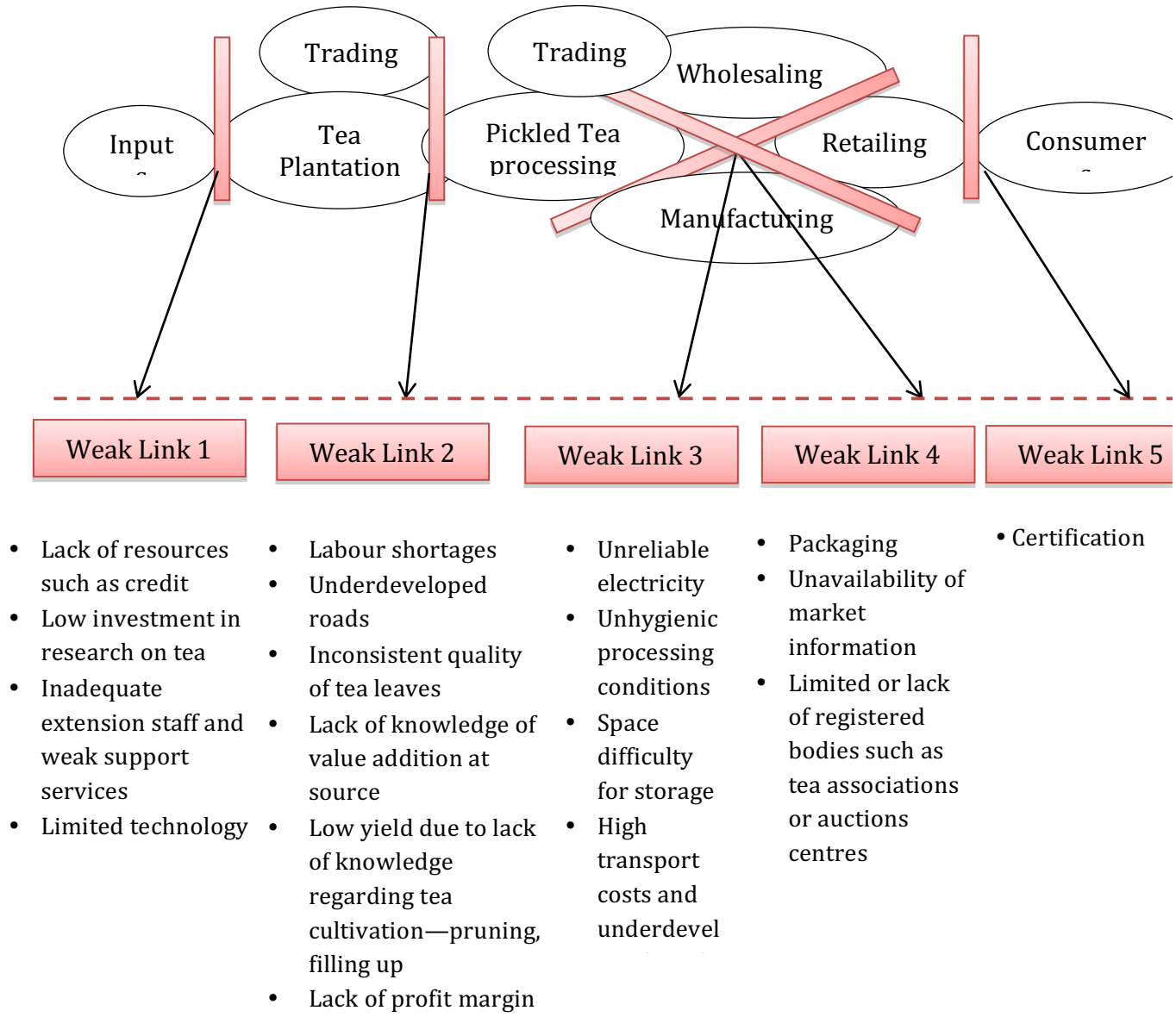


Figure 30: Weak links in the pickled tea value chain.

5.2.1 Weak link 1: Inputs

During the study, respondents mentioned the lack of credit facilities as the main obstacle to expanding land for tea farming. Farmers are willing to increase the area of land used for tea farming, but do not have the resources to do so. Access to credit for land acquisition for tea cultivation is an issue with most farmers. Kindeya (2010) stated that the more credit farmers received leads to more production and thereby signals greater propensity to sell. Therefore, the amount of credit received has a positive impact on market participation and sales volumes.

Low investment in tea research and development has been one of the main weaknesses of the Myanmar tea sector. On average, Myanmar spends only $0.06 of every $100 in agricultural output on agricultural research, compared to $0.41 by its Asian neighbours (Stads and Kam, 2007). As a result of these funding constraints, the Ministry of Agriculture and Irrigation (MOAI) currently conducts research mainly on rice, pulses, maize, cotton, sugarcane, and oil seed (Cho, 2013), with very limited research on improving varieties of tea. Increase investment in agriculture has been targeted as an engine of economic growth especially in low income countries which can orient production along more sustainable pathways (Garnett, et al., 2013). Ariyawardana (2001) also mentioned that Sri Lanka is encouraging to increase agricultural investment within the country as a whole and within the tea industry with foreign involvement. He stated that foreign involvement in the value added tea production can have positive and negative impacts on the tea industry but this will lead to achieve growth in industrial output.

A study by Holloway et al. (2000) has shown that visits by extension agents improve participation and volume of sales. The agricultural industry in Myanmar, however, is constrained by weak extension services. The ratio of extension staff to farmers is about 1:500 (Wilson, 2006). Extension staff is inadequate not only in number but also in quality, due to insufficient budgetary resources which prevent frequent field visits and hinder efficient and effective knowledge dissemination in tea growing areas..

Myanmar has abundant water resources (FAO-Aquastat, 2013); however, the lack of knowledge and technology to use water efficiently and poor water control systems remains an issue for the agricultural sector. This limited investment in irrigation and lack of technologies is mainly due to the limited research and technology transfer as described in the maize value chain in Ethiopia (Woldegiorgis, 2011).

5.2.2 Weak link 2: Tea plantations

Labour shortages are a major problem for tea farmers, especially during *Shwe Phi Oo*. In previous years, labourers from other parts of the country came to tea-growing regions during seasonal months, but this has stopped due to the recent ethnic civil unrest in the area. Moreover, as a consequence of war, people within the regions are migrating to other countries, causing labour shortages in the tea fields and resulting in tea leaves being picked too late, thereby reducing the quality of the tea leaves. Due to the shortage of labour, the labour cost for picking rises for tea farmers. Some farmers mentioned they preferred to leave their tea leaves on

the tree rather than hire labour due to the high picking cost. Shortage of labour is also mentioned by Khoi et al. (2015) in the tea value chain in Vietnam where improved cultivation techniques and the adoption of new technology is needed.

Underdeveloped roads not only reduce the quality and quantity of tea leaves through loss of product in transit, but also extend the period taken for the tea leaves to arrive at the processing houses. Similar issues are found in the butter supply chain in Ethiopia highlands where the distance causes marketed surplus to decline (Kindeya, 2010).

The inconsistent quality of tea leaves is a major concern in making pickled tea. Similar to any tea, the quality of the pickled tea depends highly on the quality of the tea leaves. For various reasons, including lack of skilled labour and less productive crops, farmers or processors sometimes mix tender flush (high quality) with mature (low quality) leaves, reducing overall quality and therefore affecting price at market. Traders and wholesalers consequently spend more time on sorting and grading the pickled tea leaves and therefore sell it at a higher price.

Farmers use traditional cultivation practices which are often less efficient and more time-consuming; their production could be improved by using more modern techniques, such as pruning the tea leaves to make it easier to pick or filling up the space where the tea plants die. Lack of knowledge of organic farming practices, a lack of awareness of local tea associations, and no direct support from the government also contribute to reduced efficiency of production.

The study also suggests that there is low price margin for farmers. Referring back to the Porter (1985) in chapter two, it is important to maximize profit to farmers

to establish and develop the pickled tea industry as lack of profit to farmers can drive them to alternate uses to the land. This research suggests that if more money taken at the retail end is transferred to the production end of the value chain, then a higher quality product could be produced. This can be achieved through improving cultivation practices, understanding market needs, increasing farmers' knowledge and skills and investing in research and development.

An example to consider here is the cooperative marketing structure of Fonterra. Fonterra Co-operative Group Limited is farmer owned co-operative dairy company. It has a unique co-operative structure where every shareholder must be a farmer. Fonterra sources milk from farmers and collects billions litres of milk overseas through farmers and joint ventures and processes the milk into many different products, ranging from milk powder to butter to ice-cream. In order to cater the demand of different markets around the world, a wide variety of brands are established (Fonterra, 2013). Similar structure has been described by Trienekens (2011) and it can also be applied to the pickled tea industry. This could enable the pickled tea farmers to gain a higher price margin.

5.2.3 Weak link 3: Processing, Trading, and Wholesaling

Electricity is a prerequisite for growth and development of any industry and therefore the unreliable electricity remains an issue for the tea industry in Myanmar. According to the Ministry of Electric Power, the electricity supply was only about half of projected demand; less than a quarter of people in Myanmar had access to electricity in 2011. Therefore, there is a risk of sudden outages and an

increase in blackouts even in the major cities of Myanmar (Dapice, 2012). As the tea leaves are picked during the daytime and pickled tea needs to be processed the same day the tea leaves are picked, farmers have to use small generators to ensure a constant supply of electricity, which increases the cost of production. Processing tea at night can also lead to unhygienic processing conditions, because there are more insects and a greater risk of contamination.

Moreover, during storage when the pickled tea is put in white plastic bags the black juices from the tea leaves can make the bags look dirty, thereby reducing its aesthetic appeal. However, this weakness can be resolved by using darker coloured plastic bags.

During the processing of pickled tea, the tea leaves need to be stored for fermentation, so storage becomes a major problem for farmers as it requires a large space. Therefore, some farmers have to sell their pickled tea to trader or wholesalers directly after a shorter period of fermentation, without being able to store the pickled tea for longer to wait for a higher price. This issue is most common in developing countries where due to lack of access to storage facilities, smallholder farmers are poorly served by small traders, making local market thin and less competitive (Mitchell et al. (2009).

The high cost of transportation and logistics in Myanmar—as a result of many decades of underinvestment, heavy regulation, and limited infrastructure (Wong & Wai, 2013)—also acts as a weakness for the pickled tea sector as well as other agricultural sectors in Myanmar. Apart from the cost of transportation, the roads are also underdeveloped, making it difficult for farmers to get their products to

market, especially for tea farmers living in remote areas. Therefore, they have to sell their products to traders and wholesalers, resulting in prices being suppressed. These weakness and constraints are similar to the potato value chain in Kenya studied by Kirumba et al. (2004) and similar short-term and long term infrastructural and institutional innovations are recommended to reduce the above challenges.

5.2.4 Weak link 4: Manufacturing and Retailing

Proper packaging of pickled tea is only available when it goes through the manufacturing chain. In the retail chain, it is simply processed into smaller quantity plastic bags with fewer added values. The retailers have limited packaging capacities and a lack of systematic knowledge of branding and marketing. Market information is neither adequate, accurate nor timely and there are no information dissemination centres for tea retailers; even local market information is not readily available. The above weaknesses are also addressed in study of the performance of value added tea producers in Sri Lanka (Ariyawardana, 2001). In the case of Sri Lanka, the Tea Promotion Bureau is responsible for developing the packaging industry and market information transfer. In Myanmar, there is also lack of registered bodies such as tea associations or auctions centres to distribute information or handle large volumes of pickled tea.

5.2.5 Weak link 5: Consumers

Certification is an important consideration for any food product. This research also supported the studies by Holleran et al. (1999), Dolan & Humphrey (2000) and Jahn (2004) on the importance of food safety and certification where all restaurants in the countries surveyed stated that certification is a very important factor. Due to the relatively high cost for certification, however, pickled tea farmers cannot afford to certify their product. In addition, farmers do not have enough knowledge about the complex regulations surrounding certification and accreditation systems. This can be resolved through cooperative governance forms as described by Trienekens (2011).

5.3 Upgrading the Value Chain

The value chain model by Fredendall & Hill (2000) presented in chapter two shows that the strength of the value chain depends on the degree of trust, relationships, and communication that exists among different participants. In the case of the pickled tea value chain in Myanmar, it can be seen that information sharing between participants is very poor, and that some participants behave in ways that undermine the activities of the others. Therefore, the value chain is underdeveloped and largely inefficient. In general, the pickled tea value chain goes only one way and consumer demand is not taken into consideration. A substantial consumer survey across various retail outlets would provide a clear understanding of what consumers would like, thus giving a better idea of demand, as well as enabling better targeted product differentiation strategies to be put in place by

individual businesses in the industry. Moreover, for producers with inconsistent information and market access, forming pickled tea cooperatives to update timely information and creating market access may minimize the marketing problems.

According to Van der Vorst et al. (2007), the key to a successful value chain is to build direct links between participants to shorten the intermediate processes, such as collection and wholesale, and ensure that farmers can access retailers such as supermarkets directly. A more direct value chain could have prompt supply of product and lesser loss in both quality and quantity during transit. There is also a growing demand to increase mainstream distribution channels, such as supermarkets, for pickled tea. However, as Giovannucci et al. (2010) stated, it is not easy for small farmers to sell their product to supermarkets. However, small farmers alone might lack the capability to build such links, and collective action with public and private support is strongly needed.

If pickled tea farmers can sell to consumers, this can shorten the supply chain, thereby reducing losses and saving on transportation and other costs. Another option is supply chain integration, where large companies conduct the main work of the supply chain—such as tea production, pickled tea processing, transport, packaging, retail and so on—to integrate different sectors along the chain and achieve enterprise operation and management of the chain.

Aigelsperger et al. (2007) stated that a company-based approach with contract farming can solve a number of value chain weaknesses by providing farmers with the necessary knowledge and inputs and helping to fulfil a smoother chain linkage, which is necessary to successfully bring a product to the market. Contract farming

is a system by which contracting entities agree to buy all produce that meets contract standards from smallholders. In this arrangement, a contractor obtains the relevant certification and ensures that the contracted farmers meet certification standards, often by supplying technical assistance and inputs (Bennett & Franzel, 2009). Similar structure was seen from the pickled tea standard factory where the pickled teas from the factory are maintained with good quality and safety measures to export to the United States. Contract farming is also strongly recommended by previous studies on value chain described in chapter two. Wang (2012) gave a recommendation on contract farming for organic vegetables to share more profit for the emerging and increasing organic market and to overcome high the certification costs.

5.4 Recommendations

5.4.1 Government strategies

Local government intervention is necessary to increase support for public investment in infrastructure, road development, research, and increasing the capacity of the agricultural extension system. It is also essential to develop a strong and stable strategic plan to encourage the development of high yield cultivation and value-added manufacturing of cash crops such as tea in the agro-based sectors. This requires investment of capital in research and extension to increase the potential business in Myanmar. Increased focus on exporting pickled tea can also promote farmers' livelihoods within a market-oriented economy; therefore, more emphasis should be placed on research.

Research findings should then be disseminated to farmers to improve cultivation and processing technologies, which will help to increase yields and improve the quality of tea leaves. Regular pruning of tea plants should be encouraged, as pruning allows easier and quicker picking of tea leaves to cope with the shortage of labour. The Myanmar Department of Agriculture is the ideal organisation to educate tea farmers on agricultural farming techniques. Farmers also need to be introduced to more hygienic ways of processing pickled tea.

The development of a market information centre to provide information to value chain participants is very important. This centre should focus on providing information about the domestic and foreign markets, consumer tastes, types of pickled tea, packaging needs, and other general inquiries relevant to the industry. This will enhance the strategic planning process and the overall competitiveness of the firm.

5.4.2 Branding

As stated in the literature review chapter, branding is considered to be an important step to upgrade the value chain and to development of a strong national brand name for pickled tea. This will aid in capturing a greater share of the market margin from exports rather than marketing under private brand names. An ideal example is ZESPRI, a successful kiwifruit brand from New Zealand which created a strong national brand through its branding and commercialisation. Similar techniques could be employed by the Myanmar pickled tea industry.

Martin & Luxton (2004) stated that effective branding requires the development of

an integrated marketing strategy, rather than merely a reliance on brand knowledge (both brand awareness and brand image), along with other marketing strategy components, such as packaging, price, and promotion, to position the brand into the higher levels of the brand typology.

Moreover, there should also be promotional assistance programmes targeted at small- and medium-scale producers to improve their brand awareness. Due to a lack of financial strength in promoting pickled tea, most of the small- and medium-scale producers produce under their own brand name. The Myanmar Government could play a considerable role in assisting pickled tea producers to create a cohesive brand and increase brand awareness.

High quality control programmes are required to promote Myanmar pickled tea as a mark of quality. As Myanmar is currently the only producer of pickled tea, this creates an opportunity for Myanmar to become a single origin of pickled tea in its own right. In regards to this a logo should be developed for quality identification and uniqueness. This will create a good reputation for the quality and reliability of Myanmar pickled tea, which has a potential to create an overall competitive advantage in an international market and could directly influence consumer loyalty. In order to achieve this, there should be a strict monitoring process and action should be taken against producers for displaying the logo without permission. For example, Sri Lanka uses a lion logo as the key symbol in promoting its tea for quality-conscious consumers. Ariyawardana (2001) stated that 70% of the value-added tea produced in Sri Lanka uses the lion logo on their product, creating a cohesive and easily identifiable brand.

5.4.3 Packaging and Food Safety

Food safety is an essential factor in consumers' purchasing decisions (Davis & Stewart, 2002). Over the past few years, there has been a rise of food safety concerns in the food chain due to improper handling and preparing of food (Redmond & Griffin, 2003). This study also stated the importance of certification for the exported pickled tea products. The Myanmar Tea Association needs to develop and implement a quality control programme for packaging pickled tea; given the high level of concerns about phyto-sanitary requirements for all food items, there is a need to adhere to or exceed the ISO standard for pickled tea production at all levels. Therefore, more support should be provided to obtain the quality certifications. As suggested in Trienekens (2011) for the inclusion of small-holders through cooperatives or food retail industry programs to overcome the high cost in certification, pickled tea industry in Myanmar is also starting up with the standard factory where the products are up to standards.

Packaging is also very important in trade promotion where competition to obtain shelf space in supermarkets is high. Package labelling and compliance is also important—packages should display all ingredients, nutritional values, carbohydrates, fats, salts, and other information, along with the production and expiry dates. Convenience packaging, where the consumer could mix the ingredients in a tea leaf salad with a plastic spoon or some kind of stirring implement, would also be great as a fast snack food.

5.4.4 Product Differentiation

Pickled tea is not a visually attractive product and it has a unique smell, but the taste of the product is very appealing. Market promotions and free tastings should be conducted so that consumers are able to taste the product before they purchase it.

Various studies have shown that product differentiation is another means of upgrading the value chain (Choudhry & Lister, 1997; Fonseka, 1997; Trienekens, 2011). Pickled tea is a unique type of tea which is in a form of tea that is eaten and not drunk in most cases so this may provide sufficient product differentiation to stand out in the global food market.

Pickled tea is also a great side snack with a beverage or on its own. Pickled tea with mixed nuts makes a good snack with beer. It can also be eaten in combination with crackers or bread for a more Westernised taste. With proper methods and research, jams and jellies could also be made from pickled tea. Since pickled tea is generally a fermented foodstuff, it could be possible to an alcohol based beverage from the product.

More than just a convenient snack food, pickled tea can be produced in other ways to enhance its health benefits, for example, as a super green dietary supplement and to use in cooking. Apart from the popular pickled tea salad in Myanmar, pickled tea can also be used in everyday dishes. A contestant on the popular New Zealand television show Master Chef (McEwen, Hollings, 2015) cooked “Braised Ginger Pork Belly with Burmese Tea Leaf Salad”, where pickled tea was cooked together with pork.

The black residue left over from processing pickled tea is currently used as a hair product on a local scale. With proper research and technology, this could be used to produce shampoo, hair dye, and other hair products. Various researchers have proven the effect of tea on hair health (Kubo et al., 1992; Kintz et al., 2000).

There is also a Burmese cook book by the name *hsa*ba* (Chaw, 2013) meaning "please eat". The book's pickled tea leaf salad recipe has been referenced by several food blogs. The book has received the Gourmet World cookbook award in 2009 and won three awards in the following categories: Best Recipe Book, Best Asian Cuisine Book, and Best First Cookbook. Encouraging publication of Burmese cook books written in English is also recommended, so consumers become more familiar with the product.

Chapter 6

SUMMARY AND CONCLUSION

6.1 Summary and Conclusion

This research was an exploratory study with an attempt to analyse the value chain of pickled tea in Myanmar, examine the performance of the participants in the value chain, and identify the weaknesses that hinder the development of the pickled tea industry. In addition, this study described the potential of pickled tea in other countries to determine if pickled tea can position itself in the market for ethnic cuisine. The data used for this study were generated from both primary and secondary sources. The primary data were collected from questionnaires and semi-structured interviews.

Value chain analysis of the study areas revealed that the main participants in the pickled tea value chain are tea farmers, pickled tea producers, wholesalers, manufacturers, retailers, and consumers. There are also governmental and non-governmental supporters, traders, brokers, and input suppliers who support the pickled tea value chain directly or indirectly. Value chains need to be strengthened to support the pickled tea market as a profit-making industry.

Constraints and weaknesses hindering the development of the pickled tea sector are found at all the stages of the value chain. At farm level, tea farmers faced a shortage of tea pickers, lower prices and yield, lack of input and credit for investment, lack of technology, lack of farm gate margin and restricted financial capacity for attaining organic certification.

At the market level, constraints included limited direct access to the market, low product price, lack of transport and storage, low quality product, and lack of policy framework. The pickled tea value chain is also constrained by weak extension services, poor linkage of research and extension, and insufficient or ineffective handling, including storage, packaging, and transportation systems.

Some potential development opportunities to improve the current situation are discussed. Value chain upgrading is a way to improve the efficiency and effectiveness of the chain. At farm level, a number of important measures to increase tea production are necessary, such as pruning and filling up of plants as well as efficient weeding, while labour should be used more effectively to carry out these tasks.

At the national level, targeted strategies should be implemented to provide the required support for newcomers to the pickled tea industry and to create a competitive environment among suppliers. The creation of a more favourable environment in terms of production, processing, marketing, branding, packaging and trading will pave the way for new investment into the pickled tea sector. It is necessary to diversify exports to include higher quality pickled tea; therefore quality improvement along the pickled tea value chain should be a key focus. Experiences from other countries on branding may prove valuable in obtaining a national trademark for pickled tea; however, the lack of reliable data and statistics is a major constraint to effective policy analysis, strategy development, and planning that requires urgent attention. The reorientation and strengthening of the policy and planning system for agriculture is clearly a high priority area where extensive capacity development is needed. This should be coupled with a focus on

improving health standards and processing techniques to attain a higher standard of food safety, in order to meet other countries' stringent food hygiene regulations on imported products.

Although pickled tea is well known in Myanmar to every Burmese, it is still relatively unknown elsewhere in the world. Only people who have been to Myanmar or been exposed to Burmese culture know about its existence. The study showed that pickled tea is a very unique product of Myanmar with a high potential for growth and development. It is a very promising enterprise that can contribute effectively to the overall social-economical aspect of the tea sector. With proper management practices, effective technologies, and a reliable support system, the nascent pickled tea market could be transformed into a profitable industry.

6.2 Suggestions for Future Research

This research on pickled tea is merely a first attempt and opportunities exist for further research in multiple areas. More research on tea production and pickled tea processing should be continued.

Profitability analysis should also be conducted to find out if pickled tea is worth introducing into specific market. This type of business analysis, which deals with the financial and economical feasibility of introducing pickled tea into a new country, is recommended for future research.

An important area for future research market research would be to explore if pickled tea salad could be accepted more broadly in the international market. International consumers do not know what pickled tea tastes like, so are not

actively demanding the product. A significant consumer survey across various retail outlets and restaurants would provide a better idea of consumers' demand which will enable to establish better product-differentiation strategies.

Taste testing is an area of research that is necessary for further studies and should be conducted to evaluate the reaction of consumers to pickled tea, with investigation into taste preferences and opinions as well as their likely use of pickled tea as a salad in their daily meals. This will contribute to a clear understanding of consumers' attitudes and opinions towards pickled tea.

Pickled tea passed the acceptable levels in the United States; however, inconsistency in the quality of the product requires more research and tests. This study revealed that there is a potential for this product in the global market, however, more laboratory tests should be conducted.

Another research opportunity would be in the field of qualitative research, which comprises a wider sampling analysis, the use of surveys, and more professional taste tests. Moreover, research on the potential for wider use of pickled tea products should also be carried out in the future; however, this would require adequate funding.

Interestingly, the value chain of pickled tea exported to the United States does not cease at the exporting stage. It involves importers which serve as wholesalers and retailers for distribution of the pickled tea within the United States. The current research, however, could not be conducted in the United States to a great extent; therefore, future research in the U.S. market is recommended in order to provide the full story of the value chain. It will be impotent to find out what happens to the

Burmese pickled tea after reaching the United States; whether wholesalers or retailers add value to the product; and if so, how much cost is incurred and what effect this has on the price of the final product; or whether pickled tea products are sold under a Burmese brand or under the brands of wholesalers or retailers. Moreover, if the costs and earnings of wholesalers and retailers could be gathered, the distribution of revenue between the exporting and importing countries can be covered more fully. In the current study the sample size was relatively small and therefore would be increased substantially in future research.

Farmers mentioned the importance of geographical location of the tea plantation when producing pickled tea. It was stated that some specific regions are most suited to growing green tea or black tea, while the study areas of Namsan and Pindaya townships are more suitable for pickled tea production. This could be due to the soil type or other environmental factors—this is another potential area for study.

REFERENCES

Abdalla, C.W. and J.D. Shaffer. (1997). Politics and markets in the articulations of preferences for attributes of the rapidly changing food and agriculture sectors: framing the issues. *Journal of Agriculture and Applied Economics*, *29*(1), 57-71.

Adiwinata, H. O., Martosupono, M., & Schoorel, A. F. (1989). *Camellia sinensis*. In E. Westphal & P. C. M. Jansen (Eds.), *PROSEA plant resources of Southeast Asia: a selection* (pp. 72-79). Pudoc, Wageningen.

Aigelsperger, L., Njuki, J., & Hauser, M. (2007, October 9-11). *Commercialising organic agriculture: Does it improve household food security? A case study from south-western Uganda.* Paper presented at International Agricultural Research for Development Conference, University of Kassel Witzenhausen and University of Göttingen.

Anandajayasekeram, P., & Gebremedhin, B. (2009). *Integrating innovation systems perspective and value chain analysis in agricultural research for development: Implications and challenges* (No. 16). ILRI (aka ILCA and ILRAD).

Ariyawardana, A. (2001). *Performance of the Sri Lankan value-added tea producers: An integration of resource and strategy perspectives* (Doctoral dissertation, Massey University, Palmerston North, New Zealand). Retrieved from http://mro.massey.ac.nz.ezproxy.massey.ac.nz/handle/10179/2007

Asopa, V. N. (2004). *Competitiveness in global tea trade.* New Delhi: Oxford and IBH.

Aung, P. P., Thwin, T., & Aye, H. H. (2005). Nutritive values of popular snacks. *Myanmar Health Sciences Research Journal, 17*(3), 130-136.

Awasom, I. (2011). Tea. *Journal of Agricultural & Food Information*, *12*(1), 12-22.

Bammann, H. (2007). Participatory value chain analysis for improved farmer incomes, employment opportunities and food security. *Pacific Economic Bulletin, 22*(3), 125.

Basu, A., Sanchez, K., Leyva, M. J., Wu, M., Betts, N. M., Aston, C. E., & Lyons, T. J. (2010). Green tea supplementation affects body weight, lipids, and lipid peroxidation in obese subjects with metabolic syndrome. *Journal of American College of Nutrition*. *29*, 31–40.

Bennett, M., & Franzel, S. (2009). *Can organic and resource-conserving agriculture improve livelihoods? A meta-analysis and conceptual framework for site-specific evaluation* (No. 11). World Agroforestry Centre.

Bryman, A., & Bell, E. (2007). *Business Research Methods* (2nd ed.). Oxford: Oxford University Press.

Carr, M. K. V. (1972). The climatic requirements of the tea plant: A review. *Experimental Agriculture*, *8*(1), 1-14.

Chacko, S. M., Thambi, P. T., Kuttan, R., & Nishigaki, I. (2010). Beneficial effects of green tea: a literature review. *Chinese medicinal Journal*, *5*(13), 1-9.

Chan, E. W. C., Lim, Y. Y., & Chew, Y. L. (2007). Antioxidant activity of *Camellia sinensis* leaves and tea from a lowland plantation in Malaysia. *Food Chemistry*, *102*(4), 1214-1222.

Chaw, T. C. (2013). *Hsa*ba: Burmese cooking book.* Retrieved from http://www.hsaba.com.

Chen, M. F. (2007). Consumer attitudes and purchase intentions in relation to organic foods in Taiwan: Moderating effects of food-related personality traits. *Food Quality and Preference*, *18*(7), 1008-1021.

Cho, K. M. (2013). Agricultural sector assessment: Current situations and future opportunities of agricultural education, research and extension in Myanmar. *Myanmar Agricultural Sector and Food Security Diagnostic Background Paper No. 5.* East Lansing and Yangon: Michigan State University, Myanmar Resource Development Institute.

Choi, S. C., & Henneberry, D. M. (2000). Ethnic food marketing: Korean kimchi in world markets. *Journal of Food Products Marketing*, *5*(4), 19-44.

Choudhry, Y., & Lister, D. W. (1997). *Sri Lanka's tea industry: Succeeding in the global market* (Vol. 368). R. Ali (Ed.). World Bank Publications.

Chu, D. C. (1997). Green tea: Its cultivation, processing of the leaves for drinking materials and kinds of green tea. In T. Yamamoto, L. R. Juneja, & M. Kim (Eds.), *Chemistry and applications of green tea* (pp 1-11). Florida: CRC Press.

Commins, T., & Sampanvejsobha, S. (2008). Development of the tea industry in Thailand. *Asian Journal of Food and Agro-Industry, 1*(1), 1-16.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. Thousand Oaks: SAGE Publications.

Cromme, N., Prakash, A. B., Lutaladio, N., & Ezeta, F. (2010). *Strengthening potato value chains: technical and policy options for developing countries*. Food and Agriculture Organization of the United Nations (FAO).

Cunningham, D. C. (2001). The distribution and extent of agri-food chain management research in the public domain. *Supply Chain Management: An International Journal*, *6*(5), 212-215.

Dapice, D. (2012). Electricity in Myanmar: The missing prerequisite for development. *Ash Centre for Democratic Governance and Innovation at the John F. Kennedy School of Government, Harvard University.*

Davis, D. E., & Stewart, H. (2002). Changing consumer demands create opportunities for US food system. *Food Review-Washington Dc-*, *25*(1), 19-23.

Dolan, C., & Humphrey, J. (2000). Governance and trade in fresh vegetables: the impact of UK supermarkets on the African horticulture industry. *Journal of development studies*, *37*(2), 147-176.

Dufresne, C., & Farnworth, E. (2000). Tea, Kombucha, and health: A review. *Food Research International*, *33*(6), 409-421.

Dunne, A. J. (2001). *Supply chain management: Fad, panacea or opportunity?* (Occasional Paper 1) Gatton, Queensland: School of Natural and Rural Systems Management, University of Queensland.

Emana, B., & Nigussie, M. (2011). Potato value chain analysis and development in Ethiopia. *The case of Tigray and SNNP regions. Consultancy report. International Potato Centre (CIP) and USAID (United States Agency for International Development), Addis Ababa*.

Enriquez, C.M. (1923). *A Burmese Arcady*. Philadelphia: Lippincott.

Faida, M. (2006). Chain empowerment: Supporting African farmers to develop markets. Royal Tropical Institute, Amsterdam.

Fonseka, A. T. (1997). Strategic approach to marketing of Sri Lankan tea. *Sri Lankan Journal of Management*, *2*, 155-182.

Fonterra (2013). *Fonterra Company Overview*. Retrieved from http://www.champions-trophy.co.nz/wp-content/uploads/2012/11/Fonterra-Company-Overview.pdf.

Food and Agriculture Organization Corporate Statistical Database (2012). FAOSTAT (On-line). Retrieved from http://www.faostat.fao.org

Food and Agriculture Organization Intergovernmental Group (FAO IGG) Secretariat (2014). FAOSTAT (On-line). Retrieved from http://faostat3.fao.org/home/E

Food and Agriculture Organization of the United Nations (2013). Myanmar: Country profile: AQUASTAT. Retrieved from http://www.fao.org/nr/myamar/aquastat-myanmar.pdf.

Food and Agriculture Organization Statistics (2015). FAOSTAT (On-line). Retrieved from http://faostat3.fao.org/browse/P/*/E

Fredendall, L. D., & Hill, E. (2000). *Basics of supply chain management*. Boca Raton, FL: St. Lucie Press, 2000.

Garnett, T., Appleby, M. C., Balmford, A., Bateman, I. J., Benton, T. G., Bloomer, P. & Herrero, M. (2013). Sustainable intensification in agriculture: premises and policies. *Science*, *341*(6141), 33-34.

Gereffi, G. (1999). International trade and industrial upgrading in the apparel commodity chain. *Journal of international economics*, *48*(1), 37-70.

Ghauri, P., Grønhaug, K., & Kristianslund, I. (1995). *Research methods in business studies: A practical study.* New York: Prentice Hall.

Giovannucci, D., Barham, E., & Pirog, R. (2010). Defining and marketing "local" foods: Geographical indications for US products. *The Journal of World Intellectual Property*, *13*(2), 94-120.

Gómez, M. I., Barrett, C. B., Buck, L. E., De Groote, H., Ferris, S., Gao, H. O., & Yang, R. Y. (2011). Research principles for developing country food value chains. *Science*, *332*(6034), 1154-1155.

Graham, H. N. (1983). Tea. In Mark, H.F., Othmer, D.R., Overberger, C.G., Seaborg, G.T., Grayson, M. (Eds.), Kirk-Othmer *Encyclopedia of Chemical Technology* (3rd Ed., pp. 628-644). *John Wiley & Sons Ltd*., New York.

Gramza-Michalowska, A. (2014). Caffeine in tea *camellia sinensis*: Content, absorption, benefits and risks of consumption. *The Journal of Nutrition, Health & Aging, 18*(2), 143-149.

Grankvist, G., & Biel, A. (2001). The importance of beliefs and purchase criteria in the choice of eco-labeled food products. *Journal of Environmental Psychology*, *21*(4), 405-410.

Groosman, M. (2011). Tea Sector Overview. *IDH Sustainable Trade Initiative.*

Grunert, K. G., Fruensgaard Jeppesen, L., Risom Jespersen, K., Sonne, A. M., Hansen, K., Trondsen, T., & Young, J. A. (2005). Market orientation of value chains: A conceptual framework based on four case studies from the food industry. *European Journal of Marketing*, *39*(5/6), 428-455.

Ha, P. T. B. (2006). *Vietnam's tea processing industry in the context of economic integration - a case study of a regional innovative cluster.* (Master's thesis, Lund University, Lund, Sweden). Retrieved from http://www.esst.eu/wp-content/uploads/thesesexamples/Pham_Thi_Bich_Ha.pdf

Handfield, R. B., & Nichols, E. L. (2002). *Supply chain redesign: Transforming supply chains into integrated value systems*. New Jersey: FT Press.

Hazarika, C., & Subramanian, S. R. (1999). Estimation of technical efficiency in the Stochastic Frontier Production Function model: An application to the tea industry in Assam. *Indian Journal of Agricultural Economics*, *54*, 201-211.

Hellin, J., & Meijer, M. (2006). Guidelines for value chain analysis. FAO, *Not published*.

Hempel, E. (2010). Value chain analysis in the fisheries sector in Africa. *Note: study carried out in collaboration with INFOSA and funded by the Trade Working Group of the PARTNERSHIP FOR AFRICAN FISHERIES, an AU/NEPAD Programme*.

Herr, M. L., & Muzira, T. J. (2009). Value chain development for decent work: A guide for development practitioners, government and private sector initiatives. Geneva, Switzerland: International Labour Office.

Hicks, A. (2001). Review of global tea production and the impact on industry of the Asian economic situation. *Assumption University Journal of Technology, 5*(2).

Hicks, A. (2009). Current status and future development of global tea production and tea products. *Assumption University Journal of Technology, 12*(4), 251-264.

Hill, S. (1998). Preliminary study using trace element concentrations and a chemometrics approach to determine the geographical origin of tea. *Journal of Analytical Atomic Spectrometry*, *13*(6), 521-525.

Holleran, E., Bredahl, M. E., & Zaibet, L. (1999). Private incentives for adopting food safety and quality assurance. *Food policy*, *24*(6), 669-683.

Holloway, G., Nicholson, C., Delgado, C., Staal, S., & Ehui, S. (2000). Agro-industrialization through institutional innovation transaction costs, cooperatives and milk-market development in the East-African highlands. *Agricultural economics*, *23*(3), 279-288.

Honn, D. (2014). *Lahpet Thokek, Burmese fermented tea leaf salad*. Retrieved from http://cafecarmo.com/index.php?mact=News,cntnt01,detail,0&cntnt01articleid=42&cntnt01origid=15&cntnt01returnid=43

Howard, M. C., & Wattana, W. (2001). *The Palaung in Northern Thailand*. Chiang Mai: Silkworm.

Huang, C.L. (1996). *Consumer Preferences and Attitudes Towards Organically Grown Produce. European Review of Agriculture Economics* **23**(3): 331-342.

Humphrey, J. (2004). Upgrading in global value chains. *Available at SSRN 908214*.

Humphrey, J., & Memedovic, O. (2006). Global value chains in the agri-food sector. United Nations Industrial Development Organization Working Paper, Vienna. Retrieved from http://agris.fao.org/agris-search/search.do?recordID=GB2013202293

Ilyas, R. M., Banwet, D. K., & Shankar, R. (2007). Value Chain Relationship: A Strategy Matrix. *Supply Chain Forum: An International Journal, 8* (1), 56-72.

Jahn, G., Schramm, M., & Spiller, A. (2004). The trade-off between generality and effectiveness in certification systems: A conceptual framework. In *Dynamics in Chains and Networks. Proceedings of the sixth international conference on chain and network management in agribusiness and food industry. Edited by HJ Bremmers, SWF Omta, JH Trienekens and EFM Wubben* (pp. 335-343).

Joshi, S. R., & Gurung, B. R. (2009). Potato in Bhutan-Value Chain Analysis. *Regional Agricultural Marketing and Cooperatives Office (RAMCO) and Department of Agricultural Marketing and Cooperatives Ministry of Agriculture*.

Kaplinsky, R. (2000). Globalisation and unequalisation: What can be learned from value chain analysis? *Journal of Development Studies*, *37*(2), 117-146.

Kaplinsky, R., & Morris, M. (2001). *A handbook for value chain research* (Vol. 113). Ottawa: International Development Research Centre.

Karori, S. M., Wachira, F. N., Wanyoko, J. K., & Ngure, R. M. (2007). Antioxidant capacity of different types of tea products. *African Journal of Biotechnology*, *6*(19), 2287-2296.

Khan, N., & Mukhtar, H. (2007). Tea polyphenols for health promotion. *Life Sciences, 81*(7), 519-533.

Khoi, N. V., Lan, C. H., & Huong, T. L. (2015). Vietnam tea industry: An analysis from value chain approach. *International Journal of Managing Value and Supply Chains (IJMVSC), 6*(3), 1-15.

Kindeya, E. K. (2010). *Analysis of butter supply chain: The case of Atsbiwenberta and Alamata Wondredas, Tigray, Ethiopia.* (Master's thesis, Haramaya University, East Harerge, Ethiopia). Retrieved from

Kingdon-Ward, F. (1950). Does wild tea exist? *Nature, 165,* 297-299.

Kinsey, J. (1998). *Supermarket trends and changes in retail food delivery*. Agriculture Outlook Forum. Retrieved from http://ageconsearch.umn.edu/bitstream/33217/1/fo98ki02.pdf

Kinsey, J., & Senauer, B. (2006). Consumer trends and changing food retailing formats. *American Journal of Agricultural Economics, 78*: 1187-1191.

Kintz, P., Cirimele, V., & Ludes, B. (2000). Pharmacological criteria that can affect the detection of doping agents in hair. *Forensic science international*, *107*(1), 325-334.

Kirumba, W., Kinyae, P., & Muchara, M. (2004). Potato Market Survey. Nairobi, Kenya: *GTZ-MoA publication.*

Kubo, I., Muroi, H., & Himejima, M. (1992). Antimicrobial activity of green tea flavor components and their combination effects. *Journal of Agricultural and Food Chemistry*, *40*(2), 245-248.

Kumar, R. (2005). *Research Methodology: A step-by-step guide for beginners.* Sage Publications Ltd, London.

Lambert, D. M., & Cooper, M. C. (2000). Issues in supply chain management. *Industrial marketing management*, *29*(1), 65-83.

Laufenberg, G., Kunz, B., & Nystroem, M. (2003). Transformation of vegetable waste into value added products::(A) the upgrading concept;(B) practical implementations. *Bioresource Technology*, *87*(2), 167-198.

Leach, E. R. (1964). *Political systems of highland Burma*. Boston: Beacon (originally published in 1954).

LeBar, F. M. (1967). Miang: Fermented tea in North Thailand. *Cross-Cultural Research*, *2*(2), 105-121.

Lee, J. H., Hwang, J., & Mustapha, A. (2014). Popular ethnic foods in the United States: A historical and safety perspective. *Comprehensive Reviews in Food Science and Food Safety*, *13*(1), 2-17.

Loconto, A. M., & Simbua, E. F. (2012). Making room for smallholder cooperatives in Tanzanian tea production: Can Fairtrade do that? *Journal of Business Ethics*, *108*(4), 451-465.

Martin, R. A., & Luxton, P. (2004, September). The Successful Commercialisation of ZESPRI™ Gold Kiwifruit. In *International Symposium on Harnessing the Potential of Horticulture in the Asian-Pacific Region, 694* (pp. 35-40).

Maule, R. (1991). Tea production on the periphery of the British Empire. *Thai Yunnan Project Newsletter*, 14.

Maung, P. P., & He, Q. (2013). Determination of flavonoids and antioxidant activity in laphet laboratory process and tea (*Camellia sinesis*) products between China and Myanmar. *International Journal of Engineering Science & Technology, 5*(3), 533-537.

Maung, P. P., He, Q., & Chamba, M. V. M. (2012). Comparison of polyphenol content between laboratory processed Laphet and China and Myanmar tea (*Camellia sinensis*) products. *Pakistan Journal of Food Sciences*, *22*(4), 180-184.

Maylor, H. & Blackmon, K. (2005). *Researching Business and Management*. Harvey Maylor and Kate Blackmon, New York.

McEwen, D., & Hollings, B. (Executive Producers). (2015). *Master Chef* (Television broadcast). Auckland, New Zealand: TV3.

Miller, C., & Jones, L. (2010). *Agricultural value chain finance: Tools and lessons*. Rome: Food and agriculture organization of the United nations (FAO).

Milne, L. (1924). *The home of an Eastern Clan: A study of the Palaungs of the Shan States*. Oxford: Clarendon.

Mintel Group (2012). Ethnic restaurants – US. London: Mintel Group Ltd.

Mitchell, J., Keane, J., & Coles, C. (2009). *Trading up: How a value chain approach can benefit the rural poor*. Overseas Development Institute (ODI).

Muktar, H., & Ahmad, N. (2000). Tea polyphenols: prevention of cancer and optimizing health. *American Journal of Clinical Nutrition*, *71,*1698S–1702S.

Myanmar Department of Agriculture and Irrigation (2012). *Agricultural development in Myanmar*. Ministry of Agriculture and Irrigation (MOAI).

Myanmar Department of Agriculture and Irrigation (2013). *Myanmar agriculture in brief.* Ministry of Agriculture and Irrigation (MOAI).

Myanmar Department of Hotels and Tourism (2014). Myanmar tourism master plan 2013-20120. Ministry of Hotels and Tourism Report. Retrieved from http://www.harrisoninstitute.org/Myanmar%20Tourism%20Master%20Plan%202013-2020.pdf.

Myanmar Department of Settlement and Land Records (2014). *Settlement and Land.* Central Statistics Office (CSO).

Myanmar Tea Association (2015). *Tea price data: Yearly records.* Myanmar Tea Association.

Naing, M. (1962). *Palaung Me Tou Palaung* (The Palaungs of Burma). Rangoon Ministry of Union Cultures (Edited by Saya Myint).

Naing, M. H. (2011). *A study on the tea production in Myanmar: A case study in Chin State.* (Master's thesis, Yangon Institute of Economics, Yangon, Myanmar).

Nasir, T., & Shamsuddoha, M. (2012). Tea production, consumption and exports in global and Bangladeshi perspective. *The USV Annals of Economics and Public Administration*, *11*(2), 74-80.

Odoch, M. (2008). *Fair-trade and tea: A comparative analysis of value chains in Kabarole district, Uganda.* (Master's thesis, Larenstein University, Netherlands)

Onduru, D. D., Jager, A. D., Hiller, S., & Bosch, R. V. D. (2012). Sustainability of smallholder tea production in developing countries: Learning experiences from farmer field schools in Kenya. *International Journal of Development and Sustainability, 1*(3), 714-742.

Ord, M. (2013). *Ten not be missed Burmese dishes*. Retrieved from http://allpointseast.com/blog/misc/food/10-not-to-be-missed-burmese-dishes/.

Pabuayon, I. M., Cabahug, R. D., Castillo, S. V. A. & Mendoza, M. D. (2009). Key Actors, Prices and Value Shares in the Philippine Coconut Market Chains: Implications for Poverty Reduction. *International Society for Southeast Asian Agricultural Sciences (ISSAAS) Journal, 15*(1), 52-62.

Palaung Working Group (2011). *Monopoly tea farms*. Retrieved from http://www.palaungland.org/wpcontent/uploads/2011/06/Tea%20Briefing%20Paper%20by%20%20English%20Version.pdf

Phromrukachat. S., Tiengburanatum, N., & Meechui, J. (2010). Assessment of active ingredients in pickled tea. *Asian Journal of Food and Agro-Industry, 3*(3), 312-318.

Pietrobelli, C., & Saliola, F. (2008). Power relationships along the value chain: multinational firms, global buyers and performance of local suppliers. *Cambridge Journal of Economics*, *32*(6), 947-962.

Pietrobelli, C., & Saliola, F. (2008). Power relationships along the value chain: Multinational firms, global buyers and performance of local suppliers. *Cambridge Journal of Economics*, *32*(6), 947-962.

Po, L. G. (2007). A food inspector's guide to ethnic foods in Michigan. Michigan State University, East Lansing, Michigan.

Poblete, L., & Grimsholm, E. (2010). *Internal and external factors hampering SME growth: a qualitative case study of SMEs in Thailand*. (Master thesis). Gotland University, Gotland, Sweden.

Ponte, S. (2002). Thelatte revolution'? Regulation, markets and consumption in the global coffee chain. *World development*, *30*(7), 1099-1122.

Porter, M. E. (1985). Competitive advantage: Creating and sustaining superior performance. New York: Free Press.

Priem, R. L. (2007). A consumer perspective on value creation. *Academy of Management Review*, *32*(1), 219-235.

Ravald, A., & Grönroos, C. (1996). The value concept and relationship marketing. *European Journal of Marketing*, *30*(2), 19-30.

Redmond, E. C., & Griffith, C. J. (2003). Consumer food handling in the home: A review of food safety studies. *Journal of Food Protection*, *66*(1), 130-161.

Reeves, S. G., Owuor, P. O., & Othieno, C. O. (1987). Biochemistry of Tea Manufacture. *Tropical Science Journal*: 27, 121-133.

Rossiter, J. R., & Chan, A. M. (1998). Ethnicity in business and consumer behaviour. *Journal of Business Research*, *42*(2), 127-134.

Sanogo, I. (2010). *How to conduct a food commodity value chain analysis?* World Food Program. Retrieved from http://documents.wfp.org/stellent/groups/public/documents/manual_guide_proced/wfp226670.pdf

Seth, A., & Randall, G. (2005). *Supermarket Wars*. Palgrave Macmillan, Basingstoke.

Simbua, E. F. (2006, August). The role of the smallholder tea based production systems in the Tanzanian tea value chain. In *Annual Meeting and Scientific Conference of the Agricultural Economists Society of Tanzania (AGREST)*, Tanzania.

Singh, O. P., Singh, P. K., Singh, H. P., Singh, R., & Regmi, K. R. (2013). A Value Chain Analysis of Vegetables: A Case Study of Palpa District, Nepal. *Economic Affairs*, *58*(2), 135-146.

Singhanetra-Renard, A. (2004). *The Palaung of Shan State*. Paper presented at European Association for Southeast Asian Studies (EuroSEAS). Paris, France.

Stads, G., & Kam, P. (2007). *Myanmar*. Agricultural Science and Technology Indicators (ASTI) Country Brief No. 38. Washington, D.C: International Food Policy Research Institute.

Statistics New Zealand (2014). *2013 Census ethnic group profile: Burmese*. Retrieved from http://www.stats.govt.nz/Census/2013-census/profile-andsummaryreports/ethnicprofiles.aspx?request_value=24732&tabname=Age,sex,andethnicities

Tainter, D. R., & Grenis, A. T. (2001). *Spices and seasonings: A food technology handbook*. Canada: John Wiley and Sons, Inc., Publication.

Tea 2030 (2014). The future of tea: A hero crop for 2030. Forum for the future. Retrieved from

https://www.forumforthefuture.org/sites/default/files/project/downloads/future-tea-report.pdf

Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioural sciences.* Thousand Oaks, CA: SAGE Publications.

Trevisanato, S. I., & Kim, Y. I. (2000). Tea and health. *Nutrition Reviews*, *58*(1), 1-10.

Trienekens, J. H. (2011). Agricultural value chains in developing countries: A framework for analysis. *International Food and Agribusiness Management Review, 14*(2), 51-82.

USAID (2006). *Commodity value chains mapping for tea in Uganda*. Retrieved from http://pdf.usaid.gov/pdf_docs/Pnadk931.pdf

Van den Berg, M. (2004). *Making value chains work better for the poor: A toolbook for practitioners of value chain analysis*. Asian Development Bank.

Van der Vorst, J., Da Silva, C., & Trienekens, J. (2007). Agro-industrial supply chain management: concepts and applications. *Agricultural Management, Marketing and Finance Occasional Paper (FAO)*, (17).

Vanhaverbeke, W., & Cloodt, M. (2006). Open innovation in value networks. In Ches-brough, H., Vanhaverbeke, W., West, J. (Eds.), *Open innovation: Researching a new paradigm* (pp. 258-281). New York: Oxford University Press.

Vuong, Q. V. (2014). Epidemiological evidence linking tea consumption to human health: A review. *Critical Review in Food Science and Nutrition, 54*(4), 523-536.

Walter, B., & Wiederecht, D. (2006). Tea. In *The new book of knowledge* (Vol. 18, pp. 34–36). Danbury, CT: Scholastic Library.

Wang, J. (2012). *Organic vegetable value chain study: Emerging organic market and opportunities for smallholder farmers in China.* (Master Thesis, Humboldt University, Berlin, Germany).

Webber, C. M., & Labaste, P. (2010). *Building competitiveness in Africa's agriculture: a guide to value chain concepts and applications*. World Bank Publications.

Wilson, T. (Ed.). (2006). *Myanmar's long road to national reconciliation*. Institute of Southeast Asian Studies.

Win., N. (2013). Experiences of Myanmar Agricultural Development Bank program on value chain finance on Agriculture. Country Report of Myanmar. Retrieved from http://www.apraca.org/upload/multi_content/329/AVCF%20Myanmar%20Country%20Report.pdf

Woldegiorigis, L. N. (2011). *Maize value chain analysis in Ethiopia: Implication of challenges and opportunities on food security.* (Master Thesis, The Hague University, Netherlands).

Woldesenbet, A. T. (2013). *Value chain analysis of vegetables: The case of Habro and Kombolcha Woredas in Oromia Region, Ethiopia.* (Master Thesis, Haramaya University, East Harerge, Ethiopia).

Wong, L. Y. C. & Wai, N. E. M. A. (2013). Field Interviews with Oilseed Value Chain Stakeholders. Yangon, Myanmar: Government of Myanmar, USAID/Burma.

Yang, C. S. (1999). Tea and health*. Nutrition, 15*(1), 946-949.

Yang, C. S., & Wang, Z. Y. (1993). Tea and cancer. *Journal of the National Cancer Institute*, *85*(13), 1038-1049.

Yao, L. H., Jiang, Y. M., Shi, J., Tomas-Barberan, F. A., Datta, N., Singanusong, R., & Chen, S. S. (2004). Flavonoids in food and their health benefits. *Plant Foods for Human Nutrition*, *59*(3), 113-122.

APPENDICES

APPENDIX-1: Laphet Value Chain Questionnaire – Farmers

Date: _____

1. **General Information**

   1.1 Name of farmer: _____

   1.2 Ph: _____

   1.3 Village/ Village Tract: _____

   1.4 Town: _____

   1.5 Province: _____

2. **Socio-demographic Characteristics**

   2.1 Gender: ☐ Female ☐ Male

   2.2 Age: _____ years

   2.3 Education: _____ years

   2.4 Number of years spent on tea plantation: _____ years

   2.5 Are you a member of an organization? ☐ Yes ☐ No

   2.6 If yes, name of organizations:

      1. _____
      2. _____
      3. _____

   2.7 What are the benefits of being a member?

      1. _____
      2. _____
      3. _____

3. **Economic status/ livelihoods**

3.1 What are the other sources of income/means of livelihood?

1. _____
2. _____
3. _____

3.2 Has there been any increase/decrease in your income in recent years?

☐ Yes ☐ No

If yes, how much? _____ %

3.3 Do you have to get credit? ☐ Yes ☐ No

If yes, sources of credit

Source	1. Agri Bank	2. Microfinance	3. Informal lenders	4.Relatives	5.Others
Interest Rate (%)					

3.4 How much credit is needed per acre? _____ Kyats/acre

3.5 Have you observed/ experienced any economic changes- price, profit, demand?

Economic Changes	1. Price	2. Profit	3. Demand
1. Yes/ 2. No			
1. Increase/ 2. Decrease			

4. **Ownership**

4.1 Do you own the tea fields? ☐ Yes ☐ No

If no, how much is the rent per year? _____ Kyats/ acres

4.2 Total area of land cultivated? _____ Acres

4.3 How many plants do you have per acre? _____ Plants

4.4 Will it be easy to expand your tea plantation? ☐ Yes ☐ No

If no, what are the constraints?

1. _____
2. _____
3. _____

5. **Production**

5.1 Sources of inputs? (seeds, fertilizers, pesticides)

Source of inputs	1. seeds	2. fertilizers	3. pesticides	4. others
From where?				

5.2 Plucking

Plucking	1. Times	2. Times	3. Times	4. Times
When??				
Total harvest (vol/ac)				
For laphet (vol/ac)				

5.3 Labor - plucking/ac, drying/ tons, …costs other?

labor	Plucking (/ac)	Drying (/MT)	Steaming (/MT)	Rolling (/MT)	Pressing (/MT)	Packaging /Storage (/MT)
Source (hired/family)						
Cost						
How						

5.4 Source of information on tea plantation such as on production, drying?

1. _____
2. _____
3. _____

5.5 Problems? ☐ Yes ☐ No

1. _____
2. _____
3. _____

5.6 Storage? ☐ Yes ☐ No

Yes	No
Where?	Where to?
How?	

6. **Marketing**

6.1 To whom do you sell your products to? Table (%)

	Traders	Contract processors	Company 1 (Name)	Company 2 (Name)	Company (Name)
Amount (%) (/ac or from total)					
Mode of sale: 1. Picked up 2. Delivered(cost)					
Contracts: 1. Yes 2. No					

6.2 What is the mean of Transportation???

7. **General Potential**

7.1 What is your overall view of the pickled tea sector?

_____

_____

7.2 What is the greatest Challenge/issue facing in tea plantation today?

Challenges _____

Issues _____

7.3 In your opinion, what are the main steps that the country should take in improving tea production?

_____

_____

APPENDIX-2: Laphet Value Chain Questionnaire – Wholesalers, Retailers, Manufacturer(Company)

Date:

1. General Information

1. Name: _____
2. Firm Name: _____
3. Principal product or services: _____
4. E-mail: _____
5. Ph: _____

2. Input Supply

- Do you have your own operated tea fields?

☐ Yes, how many acre? _____

How many plants/ acre? _____

☐ No, who supplies? _____

Do you have contract with suppliers?

☐ Yes, how much do you buy? _____ (MT) ☐ No

How much is the price? _____

- Are there any problems in obtaining high quality tea leaves? Explain.

1. _____
2. _____
3. _____

- Define High quality tea leaves?

1. _____
2. _____
3. _____

3. Market access

1. To whom do you sell your products to?

	1. Larger Firms	2. Small Firms	3.Wholesalers	4. Exporters	5. Direct to consumer
Amount (%)					
Price/MT					

2. What is the relationship you have with these buyers?

   2.1 who determines prices?

   2.2 Who determines amount purchased?

   2.3 product specifications (in jars or in packets)?

3. How do you promote and market your products?

1. _____
2. _____
3. _____
4. _____

4. How strong is the market for your product right now?

Very Poor **Very Strong**

1 2 3 4 5 6 7

5. What trends do you see for pickled tea? ☐ Increase ☐ Decrease
6. Do you ever collaborate with other firms on promotion and or marketing?

   ☐ Yes ☐ No

   If Yes, then how? _____
7. Who are the major manufacturing competitors?

   1. _____
   2. _____
   3. _____

8. Is your product exported? ☐ Yes ☐ No

Yes			
Countries	Amount (MT)	Price/ kg	How??
1.			
2.			
3.			
No			
Why not? Constraints			

Any plans in the future?	☐ Yes ☐ No If Yes, what plans?

9. What do you see as your main challenges in accessing international markets?

   1. _____
   2. _____
   3. _____
   4. _____

4. Product development

1. What are your major challenges in product design and manufacturing?

   1. _____
   2. _____
   3. _____

2. What other products do you produce/ sell?

	Pickled tea	Green tea	Black tea	Other tea
What percentage does each product represent in terms of your gross revenue?				
What have you done recently to improve your products or services				

3. What pickled tea flavors do you produce?

   1. _____

   2. _____

   3.. _____

4. Which is the most popular? _____

- Does your brand have strong recognition in quality? ☐ Yes ☐ No
-

5. Standards and Certifications

1. Is there any a standard or certification for your product? ☐ Yes ☐ No

   If yes - Who set these standards and requirements? _____

   - When? _____

   - Do you have any problems in this regards?

   _____

   If no - Are you also working on getting products certified?

   ☐ Yes, How? _____ ☐ No, why not _____

   When? _____

6. Business Membership Organization

1. Is your industry/ company represented by national or local business associations? ☐ Yes ☐ No

   If yes, _____

2. What are the primary functions of these associations?

1. _____
2. _____
3. _____

3. What are the primary benefits of these associations?
    1. _____
    2. _____
    3. _____

4. What additional services should they provide?
    1. _____
    2. _____
    3. _____

7. Policy/ Regulations

1. What government policies/ regulations benefit your business?
    - ☐ 1. Registrations
    - ☐ 2. Inspections
    - ☐ 3. Subsidies
    - ☐ 4. Incentives
    - ☐ 5. Others _____

2. What government policies/ regulations are obstacles to growing your business?

☐ 1. Registrations

☐ 2. Inspections

☐ 3. Subsidies

☐ 4. Incentives

☐ 5. Others _____

8. Infrastructure

1. What are the most important infrastructure constraints affecting your business growth and profitability?

   ☐ Road/transport conditions

   ☐ Telephone services

   ☐ Electricity

   ☐ Storage

   ☐ Others

2. What is the company doing about these problems?

_____

_____

_____

9. General Overview

1. What is your overall view of the pickled tea sector in having international export potential?

2. How do you think your company would perform locally and internationally for the supply of pickled tea in relation to strengths, weakness, opportunities and threats?

Local

Strengths	**Weakness**
Opportunities	**Threats**

International

Strengths	**Weakness**
Opportunities	**Threats**

3. What is the greatest Challenge/issue facing the company today?

APPENDIX-3: Laphet Value Chain Questionnaire - Govt. / Organization

Date: _____

1. Name: _____
2. Position: _____
3. Department/ Organization: _____
4. E-mail: _____
5. Ph: _____

1. General overview of the pickle tea sector both domestic and international?

_____

_____

2. Has Myanmar ever attempted to capture a position in the global tea industry with pickled tea?

☐ Yes, when? _____

☐ No, why not? _____

3. Has pickled tea been exported?

☐ Yes, to which countries? _____

☐ No, why not? _____

4. Has pickled tea products been certified? ☐ Yes ☐ No

   ☐ Yes, who is doing the certification? _____

   ☐ No, why not? _____

5. What re the standards and criteria for certification?

   1. _____
   2. _____
   3. _____
   4. _____

6. What are the labelling requirements?

   1. _____
   2. _____
   3. _____
   4. _____

7. Estimated time duration to get the product certified? _____
8. Intended foreign markets?

   1. _____
   2. _____
   3. _____

9. What are the constraints in the pickled tea industry?

_____

_____

10. What are the future development plans for pickled tea

_____

_____

APPENDIX-4: Laphet Value Chain Questionnaire - Restaurants

Date:_____

1. General Information

1. Name of Restaurant : _____
2. E-mail: _____
3. Ph: _____
4. Location: _____
5. Country: _____

2. Product

		Yes	No
1.	Is Pickled tea in your Menu?		
2.	Is it popular among customers?		
3.	Who are your major customers? ☐ Myanmar ☐ East Asia (Chinese, Japanese, Koreans) ☐ West Asia (Indians) ☐ Australia/ NZ ☐ American ☐ Other (tourists)		
4.	How is pickled tea served in your restaurant? ☐ Alone ☐ With nuts ☐ as a Salad ☐ Others, _____		

3. Price

	1. How much do you sell for a plate?	Currency	Price
a.			
b.			
c.			
	2. Has there been an increase in sale of pickled tea dish over the year? ☐ Yes , Yearly increase in sales _____ % ☐ No		
	3. How many plates of pickled tea do you sell in a day from total? _____ Plates out of _____ total orders / day		

4. Frequency

1. Where do you get the supply of pickled tea from? _____
2. How often do you have to order supply of pickled tea? _____
3. How much do you order per order? _____
4. Cost of shipping? _____
5. What brands do you order? _____

5. Packaging

What form do you buy the pickled tea?

☐ Jars ☐ packets ☐ plastic containers ☐ others,_____

6. Consumption Preference

What do consumers prefer eating pickled tea with?

☐ Alone ☐ With nuts ☐ as a Salad ☐ Others, _____

7. Certification

How important to you is for the pickled tea product to be certified?

Not Important					**Very Important**	
1	2	3	4	5	6	7
☐	☐	☐	☐	☐	☐	☐